Chemical Emergency Preparedness and Prevention Documents – Compilation
Documents Created by EPA HQ – CEPPO and OEM – August, 2015

Since the inception of the Chemical Emergency Preparedness and Prevention (CEPP) Program in 1985, as well the passage of the Emergency Planning and Community Right-to-Know Act in 1986, and the Clean Air Act – Risk Management Program in 1990, the CEPP Office / Office of Emergency Management has developed and distributed over one hundred documents useful for LEPCs, regulated industries, and other stakeholders.

This document contains the text only files of most of the documents. This document can be useful to officials searching for historical documents, or determining what guidance may have been developed on a specific topic.

For More Information

EPCRA: http://www2.epa.gov/epcra

NRT Hazardous Materials Emergency Planning Guidance:

http://www.nrt.org/production/nrt/nrtweb.nsf/AllAttachmentsByTitle/SA-27NRT1Update/$File/NRT-1%20update.pdf?OpenElement

Actions to Improve Chemical Facility Safety and Security – A Shared Commitment:

https://www.osha.gov/chemicalexecutiveorder/index.html

EPCRA Requirements:

http://www2.epa.gov/sites/production/files/2013-08/documents/epcra_fact_sheet.pdf

CAMEO:

http://www2.epa.gov/cameo

EPA EPCRA Regional Contacts:

http://www2.epa.gov/epcra/epa-regional-epcrarmp-contacts

EPA Superfund, TRI, EPCRA, RMP & Oil Information Center:

http://www2.epa.gov/epcra/superfund-tri-epcra-rmp-oil-information-center 800-424-9346 or 703-412-9810

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44.	PDF	Understanding Environmental Health Risks and Reducing Exposure -- Highlights of a Citizens Guide – EPA 230-09-90-082	September, 1990	
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46.	PDF	Report of a Conference on Risk Communication and Environmental Management -- Tech Assistance Bulletin 4 CEPP – OSWER 88-008	May, 1988	

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Part 1

Preface

Chemicals are an important part of the modern world. They make our water safe to drink, provide fuel for our cars, increase the production from our farms, and are often key parts of products we use every day.

Many of the properties of chemicals that make them valuable to us, however, such as their ability to kill dangerous organisms in water and pests on crops, pose a hazard to us and the environment if the chemicals are used or disposed of improperly.

EPA is committed to providing you with as much information as possible about chemicals at your local businesses, and other facilities, so that you can work with local government agencies, citizen groups, and business to ensure that the chemicals in your community are used safely.

You can also ensure that facilities and emergency responders are prepared to respond appropriately to accidents.

You and your family and neighbors are the people most at risk if chemicals in your community are being used unsafely or released into the environment.

You are in the best position to work with local agencies to ensure that you, your neighbors, local agencies, and responders are prepared to handle any accidents that do happen.

Two laws, the Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Air Act's (CAA) chemical accident prevention provisions (also called the risk management program), were specifically designed to provide you with information on chemicals at individual facilities, their uses, and releases.

Many other EPA programs also have data available, as do States, local governments, trade associations, public interest groups, and individual facilities.

Much of this information is easily available on the Internet; other information is available from State and local agencies who receive annual reports from facilities. This pamphlet:

- Summarizes the information you can obtain under EPCRA and CAA;
- Tells you where to find it;
- Tells you about other information you may also find helpful; and
- Indicates how you can use these various sources of information to build a snapshot of chemicals stored and released in your community.

It also discusses how specific groups, such as fire departments, health care professionals, State and local agencies, citizens, and industry can use the information to improve the safety of our communities.

Dealing with Chemicals: It's Everybody's Job

The Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Air Act (CAA) both require facilities to report on hazardous chemicals they store or handle, and both provide for public access to these reports.

These laws help build better relationships among government at all levels, business and community leaders, environ- mental and other public-interest organizations, and individual citizens.

The laws recognize that citizens are full partners in preparing for emergencies and managing chemical risks. Each of these groups and individuals has an important role in making the program work:

- Local communities and State governments are responsible for understanding risks posed by chemicals at the local level, managing those risks, reducing those risks, and dealing with emergencies.
- Developing emergency planning and chemical risk management at the levels of government closest to the community helps to ensure the broadest possible public representation in the decision-making process. The Local Emergency Planning Committee (LEPC) develops and reviews the community chemical emergency response plan and receives annual inventory reports. The State Emergency Response Commission (SERC) reviews local emergency response plans and receives annual inventory reports. LEPC and SERC contact names and phone numbers are available at www.rtk.net/lepc.
- Citizens, health professionals, public-interest and labor organizations, the media, and others work with government and industry to use the information for planning and responding to emergencies in the community.
- Facilities that use hazardous chemicals are responsible for operating safely, using the most appropriate techniques and technologies; gathering information on the chemicals they use, store, and release into the environment and providing it to government agencies and local communities; and helping set up procedures to handle chemical emergencies. Some industry groups and individual companies have gone beyond the letter of the law and have reached out to their communities by explaining the hazards involved in using chemicals, by opening communication channels with community groups, and by considering changes in their practices to reduce any potential risks to human health or the environment.
- The Federal government provides national leadership and assistance to States and communities to ensure they have the tools and expertise necessary to receive,

assimilate, and analyze all data, and to take appropriate measures to reduce the risk of accidents and chemical emissions. EPA helps facilities comply with the laws' requirements; it ensures the public has access to information on chemical storage and releases as well as other information to protect the nation's air, water, and soil from pollution. EPA works with industry to encourage voluntary reductions in the use and release of hazardous chemicals wherever possible.

What Information is Available?

EPCRA and the Clean Air Act's Risk Management Program provide an array of complementary information:

Emergency Release Notification. Companies must immediately report accidental releases of certain chemicals to the SERC and LEPC and file follow-up reports. Minimum reportable quantities vary from one pound to 10,000 pounds.

More than 1,000 chemicals are covered by this requirement. You can find out the name and quantity of the chemical; the duration of the release; whether the release was to air, water, or land; the potential health impacts; and who to contact for more information.

Annual Chemical Inventories. Companies must file annual chemical inventory reports on hazardous chemicals they store on site above certain quantities, usually 10,000 pounds; chemicals may be reported by hazard type or by name.

The reports tell where the chemical is located in the facility, how much is stored, and who to contact in an emergency. This information will allow you to map these facilities and see where heavy concentrations of chemicals are located. You can get copies of these reports from your LEPC or SERC.

Material Safety Data Sheets (MSDSs). Companies must submit copies of the MSDSs or list of chemicals to the SERC, LEPC, and local fire department.

MSDSs are available for more than 500,000 products that could create physical hazards or adverse health effects and include the chemical identity, components of chemical mixtures, the physical properties (e.g., boiling point), hazards (e.g., flammability, corrosivity, toxicity), and health hazards.

The SERC or LEPC can tell you which MSDSs facilities have; and, they or the facility can provide you with a copy of the MSDS. MSDSs do not have a standard format and can sometimes be confusing.

On- line databases, which often have multiple versions of MSDSs for individual chemicals, can help you find an MSDS that is well organized and easy to read.

Toxics Release Inventory (TRI). Certain facilities file annual reports on all releases of about 650 chemicals. The data include estimates of the quantities of chemicals released to air, water, and land and otherwise managed as waste.

TRI data are available on-line. You can search for specific facilities or search for all facilities in a town, county, or State.

Risk Management Plans (RMPs). Certain companies file chemical accident prevention plans that include a summary describing the facility and its processes; the worst-case and other more likely accident scenarios; the facility's accident prevention practices; its emergency response program; a recent history of serious chemical accidents (if any); and planned improvements to safety design or operations.

You also will learn why accidents have happened and find out what companies have done to prevent recurrences. You can get RMPs from EPA's Envirofacts database in a system called RMP*Info.

Community Emergency Response Plan. The LEPC has developed a community emergency response plan for chemical accidents. You can review the plan, which addresses facilities with certain quantities of 356 extremely hazardous substances (acutely toxic chemicals).

Your LEPC can provide information on which local facilities have been involved in the planning process.

What's Available on the Internet?

Profiles of the extremely hazardous substances: www.epa.gov/ceppo/ep_chda.htm#ehs

ERNS online (release reports by State by year): www.epa.gov/ernsacct/pdf/index.html

Access to the on-line copies of MSDSs maintained by a number of universities: www.hazard.com

TRI and RMP data through Envirofacts: www.epa.gov/enviro. (Also available in Envirofacts, data on facilities that have:

- Permits to release substances to water, in the Permit Compliance System database.
- Permits to release hazardous pollutants to air, in the air release database.
- Permits to store and treat hazardous wastes, in the RCRA database.)

TRI data also are available at www.epa.gov/tri, www.rtk.net, and at www.scorecard.org, which maps the location of facilities in a county or city.

How Do I Build a Picture of Chemical Use in My Community?

If you have Internet access, the easiest way to begin is to search RMP*Info and the TRI database for your city and county.

Use these to develop a list of facilities and chemicals in your area. Ask your SERC or LEPC to provide information from their records on other facilities in the community that have filed reports.

Annual chemical inventories (available from the SERC and LEPC) are likely to be the most comprehensive source because they cover the largest number of chemicals.

But remember that some facilities covered by other environmental regulations may not be required to file these inventories.

The threshold for reporting chemicals also varies among the regulations and not all companies are required to report information under every environmental regulation.

Some facilities may report acutely toxic chemicals to help LEPCs prepare local emergency response plans, but are not required to file Risk Management Plans.

In some cases, chemicals will be reported under TRI, but not under any of the other rules because TRI is based on the total quantity used during the year, not the quantity on site at any one time.

LandView

Another way to build your comprehensive list of all the facilities that use or store hazardous chemicals in your com- munity is to download your county information from the LandView web site: www.census.gov/geo/www/ tiger/landview.html. LandView is a geographic reference, like an atlas. It displays:

- A detailed network of roads, rivers, and railroads based on Census files. Jurisdictional and statistical boundaries — a set of generalized boundary files for States, congressional districts, metropolitan areas, Native American Indian Areas, Alaska Native lands, counties.
- EPA-regulated sites, a subset of the facilities, sites, and monitoring stations represented in five EPA databases including sites with air and water permits, sites handling hazardous wastes, Superfund sites, and TRI facilities.
- Selected demographic and economic information from the 1990 Census, and
- Key geographic features of the United States provided by the United States Geological Survey and other Federal agencies. LandView will give you a map which you can then fill in with data from other sources

You may be surprised at the variety of businesses that use and store hazardous chemicals. While everyone generally knows that chemical manufacturers and refineries have chemicals on site, many people don't realize that food processors and food distribution centers may have large quantities of ammonia in their refrigeration systems. Your local drinking water system and sewage treatment plant also store toxic chemicals that are used to kill dangerous bacteria in the water. Many industrial and commercial sites also use and sell chemicals.

What's Missing?

1. *Trade Secrets and Confidential Business Information.* Under the community right- to-know law, facilities are not required to disclose the identity of a chemical on a Toxic Release Inventory or an annual inventory report if it is a trade secret, but they must indicate what type of chemical it is. The risk management program allows facilities to withhold from their Risk Management Plans any information that would reveal confidential business information. In practice, less than one percent of the facilities that have filed any of these reports have claimed information as confidential or trade secret. If a facility in your community has made such a claim, you may ask EPA to determine whether the claim is legitimate.
2. *Facilities Not Required to Report.* Some facilities that handle hazardous chemicals are not required to report information under community right-to-know laws. EPA recently exempted virtually all gas stations from EPCRA reporting because the public and emergency responders are aware of the location of these facilities and of the hazards of gasoline. Likewise, facilities that handle relatively small quantities of acutely toxic chemicals and up to 10,000 pounds of other hazardous chemicals are not required to report. Many agricultural chemicals are not subject to reporting under these rules, as well.
3. *Transportation.* Chemicals transported through your community by rail, barge, or truck are not reported to EPA. You may assume that any of the chemicals you find at facilities in your locality are moving through your community via railroad lines or major highways. But, chemicals also may be transported through your community on the way to some other location. Some LEPCs have surveyed traffic on major roads and rail lines to determine which chemicals are being transported and who is transporting them. Most vehicles that carry hazardous materials must be marked with placards that identify the hazard class and give a number that identifies the specific chemical.
4. *Non-Filers.* Although environmental laws impose substantial penalties for facilities that fail to report, some companies may be unaware of their reporting obligations. When you develop a list of facilities in your community that have reported under these rules, you should check whether other, similar facilities exist in your community. Work with those facilities and your LEPC to determine whether they should also be reporting.

Data Limitations

You should know that:

The TRI annual release reports are based on estimates, not actual measurements. They also represent annual emissions; you cannot tell from the data whether the chemicals were released in large amounts over a short period of time or in small amounts every day. Information on the rate of release is needed to determine effects on human health and the environment.

The release estimates do not show the extent of human exposure. Many things can happen to a chemical when it is released; these natural processes (e.g., wind) make it difficult to determine the extent of actual exposure.

The initial reports on releases to LEPCs, SERCs, and EPA are often made while the release is occurring. The data from those reports, such as in EPA's Emergency Release

Notification System (ERNS), may not accurately reflect the quantity released, the chemicals released, or the impacts.

The quantities on site reported under EPCRA 312 and TRI are given in broad ranges; it is not possible to tell the actual quantity.

All the requirements limit the number of facilities covered, usually by including only certain chemicals and setting thresholds below which reporting is not required. TRI also covers facilities in only certain industrial sectors with more than nine employees. Other facilities may handle the same chemicals or may handle other chemicals that could pose hazards.

The offsite consequence analysis data in the RMP are usually based on conservative assumptions about the accident scenario and weather conditions and on conservative modeling; the distances reported are likely to overestimate the area potentially affected.

Information Sources

Type of Information	Where Can I Get It?
Facilities in city, county, State	LEPC, SERC, Toxic Release Inventory (TRI) and RMP*Info (located in EPA Envirofacts at www.epa.gov/enviro)
Name and address of facility Contact names	LEPC, SERC, EPA TRI and RMP*Info
Parent Company	TRI and RMP*Info
Quantities of chemicals on site	LEPC, SERC, TRI database
Chemicals and quantities in processes	RMP*Info
Annual releases to the environment	TRI
Accidental or significant releases	ERNS and RMP*Info
Physical properties of chemicals Health and safety hazards Exposure limits	LEPC, SERC, on-line MSDS databases
Offsite consequence analysis	RMPs
Prevention practices Hazard controls	RMP*Info
Wastes generated/recycled	TRI

What Do These Data Mean?

The presence of hazardous chemicals does not necessarily mean that the com- munity is at risk. These chemicals can be, and usually are, handled safely. Many of the substances covered by EPCRA pose little risk to the community because, even if spilled, they will not migrate beyond the facility; they may, however, pose risks to workers at the facility. (Other right-to-know regulations provide information to workers on workplace hazards.) Some chemicals are hazardous only if you are exposed to them over a long period of time. Most of the chemicals are dangerous only if people are exposed to them above certain concentrations. For some of the chemicals EPA has set standards detailing how much of the chemical can be released safely to the air or water per hour or day. The Occupational Safety and Health Administration (OSHA) has set permissible exposure levels for workers for many chemicals that are generally included on MSDSs.

Hazard vs. Risk

To evaluate the dangers these chemicals may create for your community it is useful to understand the difference between hazard and risk.

Hazards in chemical properties generally cannot be changed. Chlorine is toxic when inhaled or ingested; propane is flammable. There is little that you can do with these chemicals to change their toxicity or flammability. Similarly, if you live in an earthquake zone or an area affected by hurricanes, earthquakes and hurricanes are hazards. When a facility conducts a hazard review or process hazards analysis, it will identify hazards and determine whether the potential exposure to the hazard can be reduced in any way (e.g., by limiting the quantity of chlorine stored on site).

Risk usually is evaluated based on several variables, including the likelihood of a release occurring, the inherent hazards of the chemicals combined with the quantity released, and the potential impact of the release on the public and the environment. For example, if a release during loading occurs frequently, but the quantity of chemical released is typically small and does not generally migrate off-site, the overall risk to the public is low. If the likelihood of a catastrophic release occurring is extremely low, but the number of people who could be affected if it occurred is large, the overall risk may still be low because of the low probability that a release will occur. On the other hand, if a release occurs relatively frequently and a large number of people could be affected, the overall risk to the public is high.

Can We Really Assess Risk?

EPA, under the right-to-know and accident prevention regulations, does not require facilities to assess risk. In most cases, the data that are needed to estimate risk levels quantitatively do not exist. Even when such data are available, it is difficult to assign a numerical value to risk. Generally, facilities and emergency planners estimate risk - in qualitative terms - as high, medium, and low. Most potential worst-case releases are considered to be low risk, but that does not mean they could not happen; it simply means that they are unlikely to occur. Smaller releases may be more likely, but may have little effect on the surrounding community and, therefore, still would be considered low risk.

The challenge for the community and for facilities is to decide which risks need to be reduced and where time and resources can best be spent. For example, a serious release may be very unlikely, but if it could affect schools or hospitals if it happened, a community might decide to work with the facility to reduce the risk. If the same release occurred at a facility that is a considerable distance from anyone else, it might not merit any steps to reduce the likelihood.

How Can Risk Be Reduced?

Communities and facilities can work together to reduce risk. Many companies have already cut back on routine emissions, reduced the quantities of chemicals stored, or switched to less hazardous chemicals. In all cases, improved operations, such as better employee training, operating procedures, and preventive equipment maintenance, can reduce risks and improve the efficiency of the business. EPA and OSHA have imposed such safe practices requirements on facilities that handle the most hazardous chemicals. Through RMP*Info, companies and communities can compare the quantities stored, hazard controls, detection systems, and mitigation systems used for one facility with those reported by similar facilities elsewhere. These data may provide ideas on how to improve safety.

Facilities handling chemicals that could pose risks to the public have a general duty to identify the hazards of their operations, design and operate safe plants, and be pre- pared to mitigate any releases that occur. The community can use the data available under the right-to-know laws as a way to spark dialogue with facilities to find out which risks need to be reduced and how to do it.

What's in RMP*Info

Besides basic facility information (name, location, contacts), RMP*Info pro- vides information on chemicals, processes, prevention practices, and accidents. You can review the following information in RMP*Info when you call up a facility's RMP.

<u>Facility Information</u>

Executive summary

Read a description of the facility—what it does and the chemicals it uses. The summary describes the worst-case and alternative release scenarios, the general approach to preventing accidents, the five-year accident history, and steps being taken to reduce risks.

Parent company name.

Find out if a facility is owned by a larger corporation. You can search RMP*Info by the parent company name to look at RMPs from other facilities owned by the same company.

<u>Chemical Information</u>

Process chemicals

Find out which chemicals the facility has, the quantity of each chemical, the general hazard of the chemical (flammable or toxic), and number of covered processes. One chemical may appear in more than one process. If you want to review RMPs for similar facilities with the same chemical, search RMP*Info by chemical and NAICS code (which identifies the industrial sector).

Accident history

Find details of serious accidental releases in the past five years. You can learn when the accident occurred, what type of release it was (gas, liquid, fire), what impacts it had (deaths, injuries, property damage), what caused the accident, and what the facility has done to prevent a recurrence.

<u>Prevention Program</u>

Provides a list of covered processes, the NAICS code (which identifies the type of activity, such as petrochemical manufacturing), and the program level. If you want to review RMPs for similar facilities in your state or nationwide, search RMP*Info by the NAICS code.

Major hazards identified

Find out which major hazards are associated with a process. You can com- pare the list to the hazards identified by other facilities in the same NAICS code using the same chemical (search RMP*Info by NAICS code and chemical).

Process controls in use

Find out what kinds of process controls (safety measures) the facility uses to reduce the risk of an accident. You can compare the controls to those identified by other facilities in the same NAICS code using the same chemical (search RMP*Info by NAICS code and chemical).

Mitigation systems in use

Find out what kinds of mitigation systems (e.g., dikes, scrubbers) the facility uses to limit the quantity of the chemical accidentally released that reaches the community. You can compare the systems to those identified by other facilities in the same NAICS code using the same chemical (search RMP*Info by NAICS code and chemical).

Detection systems

Find out what kinds of systems the facility uses to detect releases early so they can respond quickly and limit the risk to you and your community. You can compare the systems to those identified by other facilities in the same NAICS code using the same chemical (search RMP*Info by NAICS code and chemical).

Emergency Response Program

Find out whether the facility has an emergency response plan and which local response agency the facility coordinates with to ensure a rapid and safe response if an accident occurs.

Part 2

Part 2: Stakeholders

Right-to-know laws have forged a closer relationship among citizens, health professionals, industry, public-interest organizations, and the local, State, and Federal government agencies responsible for emergency planning and response, public health, and environmental protection.

Under the provisions of EPCRA and the CAA, all of these groups, organizations, and individuals have vital roles to play in making the laws work for the benefit of everyone. The laws require facilities to provide information on the presence of hazardous chemicals in communities directly to the people who are most affected, both in terms of exposure to potential risks and the effects of those risks on public health and safety, the environment, jobs, the local economy, property values, and other factors.

These "stakeholders" include people who are best able to do something about assessing and managing risks through inspections, enforcement of local codes, reviews of facility performance and, when appropriate, political and economic pressures.

Local Emergency Planning Committees (LEPCs)

This relationship between the data and community action can best occur at the local level, through the work of the LEPC and other local groups. For example, if a local firm has reported the presence of extremely hazardous substances at its facility, several accidents, substantial quantities of chemicals, and continuing releases of toxic chemicals, a community has the data it needs to seek appropriate corrective action. In short, the laws open the door to community-based decision-making on chemical hazards for citizens and communities throughout the nation.

EPA and States implement and enforce a number of environmental laws to protect you and the environment, but these laws set minimum standards. Many industries, stimulated by right-to-know laws and public pressure, have gone beyond these standards to create a higher level of safety and performance. You can work with your local facilities to ensure that not only are they complying with State and Federal laws, but that they are also moving beyond them to protect your community.

This section describes how each of the key groups and organizations—as well as individual citizens can use the information available under these laws to fulfill the promise of community right-to-know laws: a safer, healthier environment for you and your family.

LEPCs are crucial to the success of community right to know and can play a vital role in helping you understand chemi- cal information and other environmental data.

LEPCs include local elected officials; law enforcement, civil defense, firefighting, first aid, health, and local environmental and transportation agency employees; hospital staff; broadcast and print media journalists; community activists; and industry representatives.

The LEPCs developed a community response plan to prepare for and respond to chemical emergencies, focusing on 356 extremely hazardous substances. The plans are reviewed annually, exercised, and updated. Because LEPC members represent the community, they are familiar with factors that affect public safety, the environment, and the local economy and can help you understand the chemical hazards and risks present in your community.

The LEPC also receives emergency release notifications and the annual hazardous chemical inventory information submitted by local facilities. They will make this information available to you upon written request. Facilities covered by the CAA risk management program also coordinate their on-site emergency response plans with the LEPCs. If there is more information that you want on particular chemicals or facilities, the LEPC can request it on your behalf and can serve as a forum for discussions with community groups, the public, and facilities.

What's In An Emergency Plan?

An emergency plan includes:

- Identity and location of hazardous materials;
- Procedures for immediate response to a chemical accident;
- Public notification and evacuation or shelter-in-place procedures;
- Industry contact names; and
- Timetables for testing and updating the plan.

Citizens

Community right-to-know laws and regulations were written specifically with you, the citizen, in mind. They are based on the principle that the more you and your neighbors know about hazardous chemicals in your community, the better prepared your community will be to manage these potential hazards and to improve public safety and health as well as environmental quality. By volunteering to work with your LEPC and engaging in a dialogue with local industry, you can play a major role in making the laws work.

The laws require industry and others to give you information on potential chemical hazards and inventories, on releases of toxic chemicals into the environment, on accident scenarios, and on prevention practices. There are several ways you can become involved in obtaining and using this information to enhance the quality of life in your community:

- Attend LEPC meetings and make sure all appropriate groups are members. Volunteer to serve on the LEPC as a citizen representative.
- Make sure that the LEPC has obtained all the information it needs from local facilities to prepare a comprehensive emergency response plan.
- Review and comment on the emergency response plan, and ask questions about how procedures set out in the plan affect you, your family, or your place of business.
- Ask for information from your LEPC or SERC about chemical hazards, inventories, and releases in your community. Make sure both the SERC and LEPC have established procedures to make the information reported under EPCRA readily available to the public. Ask your LEPC what facilities are doing to reduce chemical hazards.
- Use the national databases available from EPA at www.epa.gov/enviro to obtain information on chemicals in your community. This web site contains links to other government and non-government web sites that may be of interest. Many facilities may also have web sites that provide information on safety policies and practices.
- Call or visit facilities in your community and ask if they have complied with the reporting, emissions, and prevention requirements of State and Federal environmental laws.

These laws give you the opportunity to become directly involved in the decisions that affect your safety and health. Your knowledge of and participation in these programs can help ensure that they accomplish their goals in your community.

Fire Departments

Fire departments are essential members of their LEPCs not only because they are often the first to respond, but also because fire departments have important expertise regarding chemical hazards and emergency planning. Any responders who will be involved in hazardous materials response will have specific training to handle such emergencies.

Fire departments receive the same information about annual hazardous chemical inventories and MSDSs as LEPCs do. Having access to this information helps a fire department responding to a chemical emergency know which chemicals, as well as their quantities and locations, to expect at the scene. A fire department can request additional, more specific information about chemical inventories at a plant, and it can also request an on-site inspection.

Fire departments may find the emergency release notifications filed with the LEPC and the five-year accident histories reported in the RMP useful in identifying facilities in the area that are having accidents even if those accidents have not yet required a response from fire fighters. Talking to the facilities about these smaller accidents may help identify steps that can be taken to prevent more serious accidents later.

Facilities subject to the RMP rule must coordinate their emergency response plans and activities with the local fire department or LEPCs. Fire departments may want to use the opportunity to review facility plans and equipment, discuss joint exercises, and consider whether the facility can provide additional training or sup- port equipment when needed. Fire departments may also want to review RMP information on detection and mitigation systems at local facilities to determine how these may facilitate a response.

CAMEO™

The National Oceanic and Atmospheric Administration (NOAA) and EPA developed a computer software program called CAMEO™ to help firefighters meet their information management needs. CAMEO contains information about commonly transported chemicals; an air dispersion model to evaluate accident release scenarios and evacuation options; and several easily adaptable databases and computer mapping programs. Information on CAMEO can be obtained from www.epa.gov/ceppo/.

Public Institutions

Hospitals, schools, and State and local governments can be vital to the success of any emergency response action. Ambulance crews and emergency room personnel must know how to transport and treat victims of exposure to hazardous chemicals. Schools and public buildings should plan for emergencies.

The information available under EPCRA and the CAA can help these institutions prepare for emergencies and identify opportunities for risk reduction.

Here are some ways public institutions can participate in emergency planning and hazardous chemical risk reduction:

- Join the LEPC, or at least learn who represents public institutions on the committee and stay in contact with that person.
- Inform the LEPC of sensitive facilities within the community (hospitals, schools, and nursing homes) that should be included in the emergency response plan. Know how they will be notified in the event of an accident and be prepared to respond. Become familiar with plans for responding to fires and other emergencies involving hazardous chemicals.
- Work with the LEPC to build an information base about hazardous chemicals in the community. Be sure that hospitals and other medical personnel are familiar with chemical hazards that exist in the community, with the steps to take to treat people exposed, and with the actions needed to avoid contamination.
- Use the information base to identify "hot spots," or potential problem areas that warrant further investigation to determine if they represent unacceptable risks to the public health or the environment. Use this information to work with industry on voluntary programs to reduce the amounts and risks of hazardous chemicals used or released in the community.

Public institutions may also be subject to the reporting requirements under EPCRA and the CAA if they have the covered substances above the thresholds for each requirement. Water treatment and wastewater treatment plants are particularly likely to be subject to the rules.

Health Professionals

Doctors, nurses, and other trained medical professionals who serve in government health departments, hospitals, and private practice should have a particular interest in the information available under EPCRA and the CAA. Combining their medical knowledge with the specific information about chemicals obtained from the reports can make them an important source of information about risks to the public health in their communities. Here are some of the ways these professionals can participate:

- Volunteer to be a health professional representative on the LEPC.
- Participate in programs to train medical personnel to deal with emergencies involving chemical hazards (health professionals should contact their State training officer through their LEPC or SERC for more information on training programs).
- Screen information submitted to LEPCs to determine if any acute or chronic health effects may be associated with hazardous substances in their communities. Health professionals may want to use this information to develop a list of hazardous sub- stances in the community and ensure that they or the hospitals and medical centers have copies of MSDSs for every chemical or have the web addresses to locate information on these chemicals quickly in case of an emergency. MSDSs and other data available from EPA and other agencies provide emergency treatment data.
- Talk with representatives of local facilities to determine whether other chemical hazards are created by the chemicals that are present. For example, chemicals could react during a release to form other dangerous substances.

Anticipated Chemical Use

The community and planners should question any new business seeking to locate in the community about their anticipated chemical use. Many types of facilities use hazardous chemicals: food distributors and cold storage facilities may have ammonia refrigeration systems; some retailers store flammable gases. All of these can be handled safely, but placing them close to homes, schools, or hospitals may increase the risk unnecessarily. In some cases, risks are increased by locating facilities with hazardous chemicals close to each other; for example, allowing storage of explosive flammable gases next to a facility that stores chlorine for water treatment could increase the risk of a chlorine release. Planners can work with facilities to ensure that storage at a site is not dangerously close to chemicals at adjacent sites.

Land Use Planners

One of the best ways to reduce risk to the public from hazardous chemicals is to locate the chemicals at a considerable distance from areas where the public lives, shops, and plays.

The information collected under community right-to-know laws provides land use planners, school boards, property developers, and businesses with data they can use to make informed decisions about where to locate new industrial facilities and where to allow development close to existing facilities that handle hazardous chemicals.

Land use planning agencies and others involved in planning decisions should work with the LEPC to develop maps that locate facilities with chemical inventories.

The more likely scenarios (alternative scenarios) reported in the RMPs may be useful to planners. If facilities have reported that these releases could travel a half mile from the site before dispersing, planners may want to refrain from allowing new residential development, nursing homes, day care centers, or hospitals within that area; school boards may want to ensure that new schools are not located in areas within the zones of alternative release scenarios.

New industrial facilities will not have filed information under these laws, but the data from similar facilities can be used to develop estimates of how large a buffer zone is needed to protect the public.

Planners should ask the new facility about the chemicals and quantities it expects to have on site. They and the facility owner can work with the LEPC to develop estimates of what a reasonable buffer would be.

They can also look at RMPs submitted by facilities using similar types and quantities of these chemicals to determine what distances the chemicals may travel. RMP data can also help both the community and the facility determine what types of safety measures should be installed to help reduce the risk.

Industry and Small Businesses

Hazardous substances are not found only at large chemical plants and refineries. They are also used routinely by other manufacturers, by food processors and distributors, most of whom have refrigeration systems, by water treatment and sewage treatment plants, and by many small operations such as garages and dry cleaners.

Even if these chemicals are handled and used safely, they may be of concern if stored or used improperly, or during an emergency such as a fire.

Facilities and the public should review environmental data to determine which chemicals are being used in the immediate area. Even if a business does not handle any chemicals, it should be aware of any nearby facilities that are handling hazardous chemicals.

A release of these chemicals could affect the business's workers, customers, and property. Talking with the facility and with the LEPC can ensure that should an emergency occur, the business will know what to do to protect workers and customers.

The RMP data can help both the public and industry assess its practices. You can look at RMPs from other facilities in the same sector with similar numbers of employees and determine the typical quantity of chemicals used and common process controls, detection and mitigation systems used, and training approaches.

Reviewing the prevention program data may provide ideas for additional steps that could be implemented. Reviewing accident histories may indicate potential problem areas that should be considered.

Safer operations are not only good for the public, they are also more cost-effective and efficient for businesses. Preventing accidents eliminates worker injuries, as well as costly down-time and clean-ups. Reducing routine emissions cuts hazardous wastes that require treatment and special care.

Responsible Care®

Besides complying with the law, some chemical manufacturers, distributors, and other industries have developed codes of practice that address accident prevention and community involvement. The Chemical Manufacturers Association has adopted Responsible Care®, a set of management codes that address safety practices, product stewardship, and community involvement. The National Association of Chemical Distributors has adopted the Responsible Distribution Process℠, which covers the same issues for the shipping and handling of chemicals. These programs require trade association members to reach out to the public and involve the community as a partner in managing chemical risks and planning for chemical emergencies. You should talk with your local facilities to see if they have adopted these codes or have similar programs. More information on these codes is available online at www.cmahq.com and www.nacd.com.

Indian Tribes

Because of the sovereignty of many Indian tribes, Federally recognized tribes may act as States, with the same responsibilities as States.

Tribes may negotiate agreements with States in which they are located so that the State assumes some or all of the responsibilities imposed by law.

Tribes that function as Tribal Emergency Response Commissions (TERCs) receive all reports on hazardous or toxic chemicals, and citizens should go to the TERC for information. If, however, the tribe has entered into an agreement with a State, the agreement will designate who will receive reports and answer questions.

States

State agencies serve a number of roles in collecting chemical information and implementing environmental rules. In some States, all information will be collected by the same State agency; in other States, different agencies may have the lead for chemical inventories, TRI, and RMP data. All of the agencies should, however, be members of the State Emergency Response Commission, or SERC, and, therefore, if you are seeking information across all of the right-to-know rules, your SERC is a good starting point. It will either provide the information to you directly or tell which other State agency has the data and how to contact the right person. Besides providing you with information submitted to it, the SERC can:

- Ask for further information from facilities about a particular chemical or facility.
- Help you identify other sources of environmental data.
- Help you interpret the data or identify experts who can assist you in understanding chemical risks and risk reduction methods.

Data available under the right-to-know laws can also be useful to State agencies, such as the State and regional water authorities and air permitting authorities. The RMP data can help water agencies identify patterns of chemical use and practices among water treatment and waste water treatment plants nationally; with that information, they can help local water authorities improve their knowledge of chemical storage and handling.

The Federal Role

States and local communities have the primary governmental responsibility to make community right-to-know programs work. The Federal government, however, also has important contributions to make. The Federal government's major responsibilities include:

- Providing guidance, technical assistance, and training to States, communities, and industry;
- Enforcing the laws to ensure compliance;
- Maintaining a national databases for TRI reports and making the data accessible to citizens;
- Ensuring that LEPCs have the information they need to take appropriate steps to reduce the risks in their communities; and
- Collecting and distributing RMP data to States, LEPCs, and the public.

The Federal government also has a variety of responsibilities to regulate certain toxic and hazardous substances under other Federal environmental and occupational health and safety laws.

CHEMICALS IN YOUR COMMUNITY

Preface by Lee M. Thomas, Administrator, U.S. EPA

Most of us have driven past an industrial plant and wondered what was happening inside. Did you ever think to yourself:

"I wonder what they're making in there?"

"Could they be using any dangerous chemicals?"

"What if there's an accident-will they be able to warn me and my family about toxic gases-before it's too late? Has anybody made plans for an evacuation?"

"What's in that smoke that's always coming out of that smokestack? When the wind's right, it looks like it's blowing right toward my house!"

If questions like these have occurred to you, you're not alone. More and more people have become concerned about hazardous chemicals in the last few years-especially since the 1984 chemical tragedy in Bhopal, India, where a release of toxic gas killed and injured thousands of people.

In the past, citizens who wanted to know more about the hazardous and toxic chemicals in their communities had to depend on the cooperation of industry for information. Some companies were willing to answer questions and even opened their gates for public tours a few times a year. But if a company wasn't willing to share information about its operations with its neighbors, there wasn't much a concerned citizen could do about it.

All that has changed. In November of 1986, Congress passed a law designed to help America's communities deal safely and effectively with the many hazardous substances that are used throughout our society. The law is called the Emergency Planning and Community Right-to-Know Act; and this booklet has been written to help you understand and take advantage of your rights and opportunities under this far-reaching law.

The law has two main purposes: to encourage and support emergency planning for responding to chemical accidents; and to provide local governments and the public with information about possible chemical hazards in their communities.

For the law to work, industry, interested citizens, environmental and other public-interest organizations, and government at all levels must work together to plan for chemical accidents and to reduce the risk to the public from releases of toxic chemicals into the environment. The law establishes an ongoing forum at the local level for discussion and a focus for action-the Local Emergency Planning Committee.

This is a ground-breaking new approach to environmental protection. It assumes that the more citizens know about chemical hazards in their communities, the better equipped they and their local governments will be to make decisions and take actions that will better protect their families and their neighbors from unacceptable risks.

A key to successful environmental protection programs, both now and in the future, is exactly this kind of community and citizen awareness and involvement in environmental decision-making. The federal government is developing a number of products and programs to assist communities in this process, and EPA continues to have important responsibilities for controlling pollution on a national basis. But local environmental problems cannot be solved by the federal government alone. Solutions must involve the people who have a direct, immediate stake in both the problems and their resolution, supported by government at all levels.

In response to the law's requirements, states, communities, industries, and citizens' groups around the country have joined forces to:

- Write emergency plans to protect the public from chemical accidents.
- Set up procedures to warn and, if necessary, evacuate the public in case of emergency.
- Provide citizens and local governments with information about hazardous chemicals and accidental releases of chemicals in their communities.
- Prepare public reports on annual releases of toxic chemicals into the air, water, and soil.

All of this planning and information-gathering is directed toward a common goal: to help you, your local officials and community leaders to be better informed as together, you make important decisions about how to deal with toxic and hazardous materials.

This guide explains your rights and opportunities under the Emergency Planning and Community Right-to-Know Act. It is also intended to help you exercise those rights and take advantage of those opportunities. The first part of the guide describes how the law works; what its provisions were intended to accomplish; and how all members of the community can play an active part in making sure that both the letter and the spirit of the law are carried out.

The second part discusses specific groups and organizations affected by the law; describes what they can do or are required to do to make it work; and tells how they can benefit from it.

As a citizen, you now have the right to know about the chemicals in your community. You have the right to make your own informed decisions as to whether these chemicals are a threat to your health or environment. The more each of us learns about, understands, and participates in managing chemical hazards, the safer our communities will be for everyone. Working together through the Emergency Planning and Community Right-to-Know program, we may save some lives.

PART ONE: An Introduction to the Emergency Planning and Community Right-to-Know Act

Why a New Law?

On December 4, 1984, a cloud of methyl isocyanate gas, an extremely toxic chemical, escaped from a Union Carbide chemical plant in Bhopal, India. More than 2,500 people lost their lives. Tens of thousands more were injured, some suffering permanent disabilities.

Americans asked: "Could it happen here?"

A chemical release in West Virginia shortly after the Bhopal tragedy, though not nearly as serious as Bhopal, made the question even more urgent. Even before 1984, there were groups trained to deal with chemical emergencies at the federal, state and local levels - the National Response Team, Regional Response Teams, state and local response teams, and others. But there was no mandatory national program, nor were there comprehensive state and local programs everywhere in the country, to deal with chemical accidents.

> The National Response Team is composed of representatives of 14 federal agencies with responsibilities for emergency preparedness, and response. Regional Response Teams consist of regional representatives of the federal agencies on the NRT, as well as state emergency response and preparedness officials.

The Bhopal tragedy started a chain of events in this country that is still unfolding:

- The Environmental Protection Agency established the voluntary Chemical Emergency Preparedness Program (CEPP) to raise state and local awareness of the potential for accidents involving extremely hazardous substances, and to foster development of state and local emergency plans.
- At the same time, the Chemical Manufacturers Association (CMA), an industry group, also set up a voluntary program called Community Awareness and Emergency Response (CAER). The CAER program encourages plant managers to become more involved in their local community by explaining their plant's operations and participating in local emergency planning.
- Environmental and labor groups became more active in working toward local and national legislation to protect against chemical accidents.
- More than 30 states passed laws (some before Bhopal) giving workers and citizens access to information about hazardous substances in their workplaces and communities. There are differences in these laws, but most require reporting of toxic chemical releases and the presence of hazardous substances. In some cases, that information is made available to the public.
- With these and other efforts in mind, Congress enacted the Emergency Planning and Community Right-to-Know Act. The new Jaw makes many of these voluntary programs mandatory. The federal law does not preempt states or local communities from having more stringent or additional requirements. It requires that detailed information about the nature of hazardous substances in or near communities be made available to the public. The law also provides stiff penalties for companies that do not comply, and it allows citizens to file lawsuits against companies and government agencies to force them to obey the law.

Dealing with Chemicals: It's Everybody's Job

The Emergency Planning and Community Right-to-Know Act creates a new relationship among government at all levels, business and community leaders, environmental and other public-interest organizations, and individual citizens. For the first time, the law makes citizens full partners in preparing for emergencies and managing chemical risks. Each of these groups and individuals has an important role in making the program work:

- **Local communities and states** have the basic responsibility for understanding risks posed by chemicals at the local level, for managing those risks, for reducing those risks, and for dealing with emergencies. By developing emergency planning and chemical risk management at the levels of government closest to the community, the law helps to ensure the broadest possible public representation in the decision-making process.
- **Citizens, health professionals, public-interest and labor organizations, the media,** and others are working with government and industry to use the information for planning and response at the community level. The new law gives everyone involved access to more of the facts they need to determine what chemicals mean to the public health and safety.
- **Industry** is responsible for operating as safely as possible using the most appropriate techniques and technologies; for gathering information on the chemicals it uses, stores, and releases into the environment and providing it to government agencies and local communities; and for helping set up procedures to handle chemical emergencies. Beyond meeting the letter of the law, some industry groups and individual companies are reaching out to their communities by explaining the health hazards involved in using chemicals, by opening communications channels with community groups, and by considering changes in their practices to reduce any potential risks to human health or the environment.
- **The federal government** is responsible for providing national leadership and assistance to states and communities so they will have the tools and expertise they need to receive, assimilate, and analyze all Title III data, and to take appropriate measures in accidental risk and emissions reduction at the local level. EPA is also working to ensure that industry complies with the law's

requirements; the public has access to information on annual toxic chemical releases; and the information is used in various EPA programs to protect the nation's air, water, and soil from pollution. EPA is also working with industry to encourage voluntary reductions in the use and release of hazardous chemicals wherever possible.

(Part II of this booklet provides more detailed information on the roles and responsibilities of these groups.)

How the Law Works

The Emergency Planning and Community Right-to-Know Act contains four major provisions:

- Planning for chemical emergencies.
- Emergency notification of chemical accidents and releases.
- Reporting of hazardous chemical inventories.
- Toxic chemical release reporting.

The law also deals with trade secrets, disclosure of information to health professionals, public access to information gathered under the law, and other topics. The four major elements are described in this section. (The main provisions of the law are also outlined in the box on later.)

Emergency Planning

The emergency planning section of the law is designed to help your community prepare for and respond to emergencies involving hazardous substances. Every community in the United States must be part of a comprehensive plan.

The governor of your state must appoint a State Emergency Response Commission (SERC). The governor can choose to name one or more existing state agencies, such as the environmental, emergency, health, transportation, commerce, and other relevant agencies, as the SERC.

Members of trade associations, public-interest organizations, and others with experience in emergency planning may also be included on the SERC. These commissions have already been named in all 50 states, and the U.S. territories and possessions.

Each SERC in turn has divided its state into local emergency planning districts, and must appoint a Local Emergency Planning Committee (LEPC) for each district. These committees should be broadly representative of their communities. They must include:

- Representatives of elected state and local officials.
- Law enforcement officials, civil defense workers, and firefighters.
- First aid, health, hospital, environmental, and transportation workers.
- Representatives of community groups and the news media.
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, small businesses, etc.

Around the country, LEPCs have been getting organized, and thousands of people, both volunteers and professionals, are participating in this program.

Your LEPC's first jobs are to get organized, receive information, analyze hazards, and proceed to develop a plan to prepare for and respond to chemical emergencies in your district. The initial plan must be completed by October 17, 1988 and must be exercised, reviewed annually, and updated. It should be based on the chemical information reported to the LEPC by local industries and public and other facilities with chemicals. This information enables the LEPC to conduct a community hazard analysis, identifying types and location of chemical hazards, vulnerable areas and populations, and the risk of accidents and their effects on the community.

Once the hazards have been analyzed, the LEPC develops a local emergency response plan. The plan lays out potential local hazards, response capabilities, and procedures to follow in an emergency. (The box on this page shows the elements of a comprehensive plan.) The planning process may identify opportunities for reducing risks by reducing chemical inventories.

Required Elements of a Local Emergency Plan

An emergency plan must:

- Use the information provided by industry to identify the facilities and transportation routes where hazardous substances are present.
- Establish emergency response procedures, including evacuation plans, for dealing with accidental chemical releases.
- Set up notification procedures for those who will respond to an emergency.
- Establish methods for determining the occurrence and severity of a release and the areas and populations likely to be affected.
- Establish ways to notify the public of a release.
- Identify the emergency equipment available in the community, including equipment at facilities.
- Contain a program and schedules for training local emergency response and medical workers to respond to chemical emergencies.
- Establish methods and schedules for conducting "exercises" (simulations) to test elements of the emergency response plan.
- Designate a community coordinator and facility coordinators to carry out the plan.

The list of 366 "extremely hazardous substances" identified by EPA as having immediate health effects and hazardous properties may serve as a focus for emergency planning, but plans should address all hazardous materials in the community that present risks to public health and safety. These substances are found in some widely used insecticides, herbicides, fertilizers, preservatives, photographic chemicals, and solvents as well as in wastewater treatment and drinking water treatment processes. (This and other chemical lists covered by the Emergency Planning and Community Right-to-Know Act are discussed later.)

The list of extremely hazardous substances includes a "threshold planning quantity" for each substance. If this amount or more of the chemical is present at any manufacturing plant, warehouse, hospital, farm, small business, or other facility, the owner or operator must notify both your state emergency response commission and your local emergency planning coordinator. This lets the planners know what hazardous chemicals are being used and stored in your community.

The facility's owner or operator must also name an employee as "facility coordinator," and that person must participate in your district's planning process.

Facility owners or operators who violate the reporting provisions of this section of the law are subject to civil penalties of up to $25,000 a day for each day a violation continues.

Your LEPC will appoint an information coordinator who will receive and process information as it is submitted to the committee and make it available to the public.

One of the distinctive characteristics of Title III is that an emergency response plan must address these unique characteristics in your community-a fill-in-the-blanks plan will not do this. Since membership on the LEPC is broad-based, your LEPC should be familiar with your community. It should know about the capacities of local hospitals, and about the location of schools, nursing homes and other special considerations in the community. It should consider all these factors in developing the emergency response plan.

The LEPC must let you and your neighbors know about the plan by publishing notices and scheduling public meetings, where you will have a chance to comment on the LEPC's activities. Your LEPC must also conduct emergency drills to make sure the plan will work if an accident occurs.

The plan due in October 1988 is the beginning, not the end, of your LEPC s responsibilities. The LEPC must review the plan annually, and as new information becomes available, your district's plan will have to be updated. The LEPC will be a focal point in the community for information on hazardous chemicals. LEPC meetings will also provide a forum for discussions of how your community should address hazardous situations identified during the planning process.

The SERCs also have continuing responsibilities: they must supervise and coordinate the activities of LEPCs, and they and LEPCs must establish procedures for receiving and processing public requests for information collected under other sections of the new law. They must also review local emergency plans annually to make sure of such things as coordination across the state.

If your SERC and LEPC do their jobs well under this new planning process, your community should be much better prepared to deal with chemical accidents than in the past, and will be better able to make decisions about the presence of chemicals in the community.

Emergency Release Notification

If there's a chemical accident at a commercial, municipal, or other facility or on a transportation route in your community, and if the accident results in the release of any one of a large number of hazardous substances, you have a right to know about it.

Under the Emergency Planning and Community Right-to-Know law, a facility must immediately notify the community and the state-the LEPC and the SERC-of the release of more than a predetermined amount of one of these chemicals. If the release results from a transportation accident, the transporter can dial 911 or the local telephone operator to report it.

Chemicals covered by this section include not only the 366 "extremely hazardous substances" mentioned in the preceding section, but also more than 700 hazardous substances subject to the emergency notification requirements of the Superfund hazardous waste cleanup law (some chemicals are on both lists). Superfund requires notification of releases to the National Response Center (NRC), which alerts federal responders.

For some of the most hazardous and toxic chemicals on these lists, releases of more than one pound must be reported. For others, the reporting quantities range from ten to 10,000 pounds. EPA is combining these two lists of chemicals into a single master list for accidental release reporting so that releases will be reported to federal, state, and local levels.

- The name of the chemical.
- The location of the release.
- Whether the chemical is on the "extremely hazardous" list.
- How much of the substance has been released.
- The time and duration of the incident.
- Whether the chemical was released into the air, water, or soil, or some combination of the three.
- Known or anticipated health risks and necessary medical attention.
- Proper precautions, such as evacuation.
- A contact person at the facility.

The notification will activate emergency plans. Information on emergency releases will also be considered in the SERC and LEPC planning process.

The law also requires follow-up reporting. As soon as practicable after the release, the facility coordinator must submit a written report to both the LEPC and the SERC. The follow-up report must update the original notification and provide additional information on response actions taken, known or anticipated health risks, and, if appropriate, advice regarding any medical care needed by exposure victims.

Any person who fails to notify the authorities of a release or to submit a follow-up emergency report is subject to civil penalties of up to $25,000 a day for each day of noncompliance. Repeat offenders can be fined up to $75,000 a day.

In addition, criminal penalties may be imposed on any person who knowingly and willfully fails to provide notice; criminal violators face fines of up to $25,000 or prison sentences of up to two years. Repeat criminal offenders can be fined up to $50,000 and imprisoned for as long as five years.

Hazardous Chemical Reporting

Information about accidental chemical releases is only the beginning of your "right to know" about hazardous substances. You also have a right to information about the amounts, location and potential effects of hazardous chemicals present in your community.

Facilities must report this information to your LEPC, your SERC, and your local fire departments. The LEPC and SERC, in turn, must make the information available to the public.

Never before has such comprehensive information on chemicals been so accessible to the public. All companies, large or small, manufacturing or nonmanufacturing, are potentially subject to this requirement.

This information provides a tool which can be used to lower chemical hazards in the community by reducing chemical inventories. The reports are also essential for LEPCs and emergency response workers, providing the raw material for the emergency planning process discussed earlier. Fire departments and public health officials will use the information to plan for and respond to emergencies.

Facilities must report on the hazardous chemicals in two different ways.

The first is through material safety data sheets (MSDSs), which contain information on a chemical's physical properties and health effects. Under federal laws administered by the Occupational Safety and Health Administration (OSHA), companies are required to keep MSDSs on file for all hazardous chemicals in the workplace. They must also make these sheets available to their employees, so workers will know about the chemical hazards they are exposed to and can take necessary precautions in handling the substances.

Under the Emergency Planning and Community Right-to-Know Act, facilities must submit either actual copies of the MSDSs, or lists of MSDS chemicals that are present at the facilities. These must be sent to the LEPC, the SERC, and the local fire department. This reporting requirement has been in effect since October 17, 1987.

The reporting for this part of Title III is based not on any list of specific chemicals, but on a definition of "hazardous chemical" under OSHA's requirements--essentially any chemical that poses physical or health hazards. As many as 500,000 products can fit the definition and thus, if present in amounts above the thresholds, must be routinely reported. Information below the thresholds must be provided by the facility when it is requested by the LEPCs.

When the Act was passed in 1986, OSHA's regulations applied only to manufacturers. OSHA has since expanded its requirements to include most facilities where workers are exposed to hazardous chemicals, and the community reporting requirements are tied to OSHA's by law. Before the change, about 350,000 facilities were covered by OSHA; now, an estimated 4.5 million facilities are covered.

The second way that companies must report on hazardous chemicals is by submitting annual inventories of these same hazardous chemicals to the same three organizations-the LEPC, the SERC, and the local fire department. The first annual inventory report was due on March 1, 1988.

The law includes a "two-tier" approach for annual inventory reporting. Under Tier I, a facility must report the amounts and general location of chemicals in certain hazard categories. For example, a Tier I report might say that a facility stores 10,000 pounds of substances that cause chronic health effects.

A Tier II report contains basically the same information, but it must name the specific chemical. A Tier II report might say that the facility has 500 pounds of benzene, and it would indicate the physical and health hazards associated with benzene.

Congress gave companies the flexibility to choose whether to file Tier I or Tier II forms, unless the SERC, LEPC, or fire department request Tier II. EPA believes that Tier II reports provide emergency planners and communities with more useful information, and is encouraging facilities to submit Tier II forms. Many companies have voluntarily provided Tier II reports.

You can gain access to MSDS and annual inventory reports by contacting your SERC or LEPC. While the information is available to the public, companies can ask that the locations of specific chemicals within the facility be kept confidential. This means that SERCs, LEPCs, and local fire departments can use the location information but not disclose it to the public.

Violators of the hazardous chemical reporting provisions are subject to the following penalties: for failing to submit MSDSs or lists of MSDS chemicals, civil penalties of up to $10,000 a day for each violation; for non-compliance with the annual inventory requirements, $25,000 per violation.

Toxic Chemical Release Reporting

Along with all the information on hazardous chemical use, storage and accidental release described above, you also have the right to know if certain manufacturing plants are routinely releasing any of some 320 toxic chemicals into the air, water or soil of your community.

This fourth major element of the Emergency Planning and Community Right-to-Know Act applies to facilities with ten or more employees that manufacture, process or use more than "threshold" amounts of these chemicals. An estimated 30,000 facilities nationwide are subject to reporting. They must estimate each year the total amount of the chemicals that they release into the environment-either accidentally or as a result of routine plant operations-or transport as waste to another location.

Reports must be filed by July 1 of each year covering releases in the previous calendar year. The first reports, covering 1987, were due on July 1, 1988.

Many chemicals covered by this section, although not all, pose long-term (chronic) health and environmental hazards such as cancer, disorders of the nervous system, and reproductive disorders from on-going routine exposure. To find out more about their health and environmental effects, see the "For Further Information" section.

While all Title III reports are intended for community use, some are submitted to LEPCs and SERCs, and fire departments; the annual release reports are submitted to EPA headquarters and to the state environmental, health, or emergency response agency which coordinates with the SERC. EPA is required to compile them into a national computerized data base called the Toxic Release Inventory, or "TRI." This data base must be accessible to the public through computer telecommunications and other means.

You will be able to obtain the release information on microfiche from a public library in your county; your state office where the forms are filed; federal depository libraries; the LEPCs, which also are a focal point for the data dissemination at the local level and will be able to access and review TRI for your community; and from EPA regional offices. Until the information has been computerized, you can get copies of the actual reports submitted by industry from your state or EPA.

You may also be able to get copies of the reports from submitting facilities, although they are not required to release their reports directly to citizens.

If you own a home computer and a telephone modem, you will also be able to call up the TRI data base "on line" on your computer to see what releases have occurred in your community (a nominal access fee will be charged).

You will be able to search through the reports electronically and pull out information of interest from more than one report at a time-for example, all reports filed by facilities in your zip code, or all discharges to a particular river, or all reports which include releases of a specific chemical. The public data base will be available in the spring of 1989.

The annual release data can be used, along with the other information the LEPC receives, to put together a more complete picture of the hazardous substances in your district.

Companies can also use the release information they collect to assess their operations with an eye to reducing the amount of toxic chemicals they use and release into the environment. Information that must be gathered and reported under this section of the Act includes:

- Which toxic chemicals were released into the environment during the preceding year.
- How much of each chemical went into the air, water and land.
- How much of the chemicals were transported away from the site of the facility for disposal.
- How chemical wastes were treated on-site.
- The efficiency of that treatment.

Companies that fail to file annual toxic chemical release reports are subject to civil penalties up to $25,000 a day for each chemical they should be reporting.

Many companies already report data on chemical emissions to EPA and the states under other environmental laws such as the Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery Act. The annual release reporting requirement is different because releases of a specific chemical to air, water, and land will appear on one form, and because the public will have direct access to the data.

By using the TRI data base, you will be able to determine the estimated annual emissions of the same chemical in a specific geographic area. You will also be able to compare the emissions reported by similar facilities in different parts of the country, to see which ones are doing the best job of controlling their releases.

The information reported under this section of the Act has some limitations. For one thing, much of the data in the Toxic Release Inventory will be based on estimates, not on actual measurements of releases.

Because most facilities do not normally monitor their releases, EPA is providing guidance to ensure that estimates are as accurate as possible. EPA will also conduct some audits and inspections to help facilities improve the accuracy of the data they report.

A second limitation is that not all toxic chemicals or sources of toxic chemical releases are covered. Only facilities in the manufacturing sector with ten or more employees must report.

A third limitation of the reports is that they show only total annual emissions, so you will not be able to learn from the Toxic Release Inventory whether a chemical was released in large amounts over a short period of time, or in small amounts every day throughout the year.

Information on the rate that chemicals are released can be important in determining the effects of the release on human health and the environment; but the TRI will not provide this information, at least in the early years of the program.

A final limitation is that the reports cover releases of chemicals, but do not show the extent of public exposure to the chemicals after they enter the air, water, or soil. (An exposure is the concentration of a chemical at the time an individual comes in contact with it.)

Many things can happen to a chemical once it is released into the environment; these processes make it difficult to determine the extent to which people are actually being exposed to chemicals as the result of any particular release.

What the Toxic Release Inventory can do best is to serve as a "pointer" to potential toxic chemical problems.

The TRI will enable EPA, state and local agencies, and citizens to look for "hot spots," or areas with apparently high emission levels. Using this information, environmental agencies can set priorities for further investigation and possible regulatory or other action, if needed, to protect the public health and the environment.

Environmental agencies, as well as public-interest organizations and LEPCs, can also use the data to encourage facilities to cut back on their releases.

As you learn more about toxic chemical releases and other hazardous substances in your area, you may want to consult with local and state health officials, environmental professionals, labor union officials, and other experts for advice on how you can use this information to make your community a safer and healthier place to live.

Highlights of the Law

Emergency Planning (Sections 301-303)

- Governors appoint state emergency response commissions (SERCs).
- SERCs establish emergency planning districts and appoint, supervise, and coordinate local emergency planning committees (LEPCs).
- LEPCs develop local emergency response plans and review them at least annually.
- Facilities notify SERCs and LEPCs if they have extremely hazardous substances present above "threshold planning quantities," and participate in emergency planning.

Emergency Release Notification (Section 304)

- Facilities notify SERCs and LEPCs immediately of accidental releases of hazardous substances in excess of "reportable quantities" and provide written reports on actions taken and on medical effects.
- SERCs and LEPCs make accidental release information available to the public

Hazardous Chemical Reporting (Sections 311-312)

- Facilities submit material safety data sheets (MSDSs) or lists of hazardous chemicals on-site (above "threshold quantities") to SERCs, LEPCs, and local fire departments.
- Facilities submit emergency and hazardous chemical inventory forms (amounts and locations of chemicals) to SERCs, LEPCs, and local fire departments.
- SERCs and LEPCs make hazardous chemical information available to the public.

Toxic Chemical Release Reporting (Section 313)

- Covered facilities submit annual reports on yearly toxic chemical releases to states and EPA.
- EPA establishes a national toxic chemical release inventory based on facility, reports.
- States and EPA make release information available to the public and communities, EPA makes the information accessible on a national computerized data base, and by other means.

Trade Secrets (Section 322)

- Facilities may claim chemical identity information trade secret, but must substantiate the claim.
- Trade secret information may be disclosed to health professionals for diagnostic, treatment, and prevention purposes.
- Citizens may challenge trade secret claims by petitioning EPA.

Penalties and Citizen Suits (Sections 325-326)

- The government may assess civil and administrative penalties of $10,000 to $75,000 per day against facilities that fail to comply with the above provisions.
- Anyone who knowingly and willfully fails to provide emergency release notification is subject to criminal penalties of up to $50,000 or five years in prison.
- The SERC, LEPC, or the state or local government may initiate actions against facility owners or operators for failure to comply with Title III requirements.
- Citizens may initiate civil actions against EPA, SER Cs, and facility owners and operators for failure to comply with the law.
- Anyone who knowingly and willfully discloses trade secret information may face penalties up to $20,000 and/or one year in prison.

- States may sue EPA for failure to provide trade secret information.

It's in the Federal Register

You can find detailed information on the various provisions of the Emergency Planning and Community Right-to-Know Act in the Federal Register, which is available at public or university libraries. Here are the Federal Register citations for the EPA regulations covering various sections of the Act:

- Sections 301 to 303 (emergency planning): April 22, 1987, December 17, 1987, February 25, 1988 (40 CFR 300 and 355)
- Section 304 (emergency release notification): April 22, 1987, December 19, 1987, February 25, 1988 (40 CFR 300 and 355)
- Sections 311-312 (hazardous chemical reporting): October 15, 1987, August 4, 1988 (40 CFR 370)
- Section 313 (toxic chemical release reporting): February 16, 1988, June 20, 1988 (40 CFR 372)
- Section 322 (trade secrets): July 29, 1988 (40 CFR 350)
- Sections 325-326 (penalties and citizen suits): to be published

Trade Secrets

Companies reporting under the Emergency Planning and Community Right-to-Know Act can, under very limited conditions, request that the identity of specific chemicals in their reports not be disclosed to the public. No other information required by this law in the reports can be withheld from the public.

To protect a chemical's identity from disclosure, the company must be able to prove among other things that the information has not been reported under any other environmental regulation, and that it is a legitimate trade secret-in other words, that disclosure could damage the company's competitive position.

The chemical's identity must be included in the company's reports to EPA. EPA will keep the original reports in a confidential file, and "sanitized" versions, with the chemical name deleted, will be available to the public.

SERCs and LEPCs will also receive sanitized versions and make them available to the public. Information about the general category of the chemical, which will enable you to determine its health and environmental effects, will be included in the public version of the report.

Facilities must substantiate any trade secret claims when they are submitted. If you or any other citizen wants to challenge a trade secret claim, you can do so by filing a petition requesting disclosure of the chemical identity with EPA. EPA will then review the claim to insure that it is a valid trade secret.

Companies should be careful when preparing trade secret claims. Owners and operators who submit frivolous claims can be penalized up to $25,000 for each such claim.

The law also allows health professionals to obtain access to trade secret chemical information if they need it to diagnose and treat patients or to do research.

To receive the information, they must submit a written request for access to the chemical identity, along with a statement of need and a confidentiality agreement. (In medical emergencies, physicians and nurses can obtain the information without providing a confidentiality agreement and statement of need in advance. They must, however, submit these documents as soon as circumstances permit, if asked to do so by the company.)

Lists of Chemicals

There are four groups of chemicals subject to reporting under the Emergency Planning and Community Right-to-Know Act. Some chemicals appear in several groups.

Extremely Hazardous Substances (Sections 301-304)

This list currently contains more than 300 chemicals. Because of their extremely toxic properties, these chemicals were chosen to provide an initial focus for chemical emergency planning. If these chemicals are released in certain amounts, they may be of immediate concern to the community. Releases must be reported immediately.

Hazardous Substances (Section 304)

These are hazardous substances listed under previous Superfund hazardous waste cleanup regulations (Section 103(a) of the CERCL-Superfund). The current list contains about 720 substances. Releases of these chemicals above certain amounts must be reported immediately because they may represent an immediate hazard to the community.

Hazardous Chemicals (Sections 311-312)

These chemicals are not on a list at all, but are defined by Occupational Safety and Health Administration regulations as chemicals which represent a physical or health hazard. Under this definition many thousands of chemicals can be subject to reporting requirements. Inventories of these chemicals and material safety data sheets for each of them must be submitted if they are present in the facility in certain amounts.

Toxic Chemicals (Section 313)

There are now more than 320 chemicals or chemical categories on this list, which were selected by Congress primarily because of their chronic or long-term toxicity. Estimates of releases of these chemicals into all media-air, land, and water-must be reported annually and entered into a national data base.

For further information on the chemical lists, contact your local Emergency Planning Committee or State Emergency Response Commission.

Key Deadlines

Requirement	Deadline
Governors establish State Emergency Response Commissions (SERCs)	April 17, 1987
Facilities subject to emergency planning requirements notify state commissions	May 17, 1987, or 60 days after they become subject to this provision
SERCs designate emergency planning districts	July 17, 1987
SERCs appoint members of Local Emergency Planning Committees (LEPCs)	August 17, 1987
Facilities subject to emergency planning requirements notify LEPCs of their facility coordinator	September 17, 1987
Covered manufacturing and importing facilities submit material safety data sheets (MSDSs) or lists of MSDS chemicals to SERCs, LEPCs, and local fire departments	October 17, 1987
Covered manufacturing and reporting facilities submit hazardous chemical inventory forms to SERCs, LEPCs, and local fire departments	March 1, 1988 (and annually thereafter)
Facilities submit their first toxic chemical release reports to EPA and designated state agencies	July 1, 1988 (and annually thereafter)
Covered non-manufacturing facilities submit MSDSs or lists of MSDS chemicals to SERCs, LEPCs, and fire departments	September 24, 1988
LEPCs complete their first emergency plans	October 17, 1988
Covered non-manufacturing facilities submit hazardous chemical inventory reports to SERCs, LEPCs, and fire departments	March 1, 1989 (and annually thereafter)

PART TWO: How Key Groups Are Affected by the Emergency Planning and Community Right-to-Know Act

A New Relationship

The Emergency Planning and Community Right-to-Know Act has forged a closer, more equal relationship among citizens, health professionals, industry, public-interest organizations, and the local, state, and federal government agencies responsible for emergency planning and response, public health and environmental protection.

In the past, most of the responsibility for these activities fell to experts in government and industry.

To the extent that citizens or their representatives participated, it was generally "from the outside looking in," as they did what they could to influence decisions that were, for the most part, out of their hands.

But under the provisions of the Emergency Planning and Community Right-to-Know Act, all of these groups, organizations and individuals have vital roles to play in making the law work for the benefit of everyone.

The law requires facilities to provide information on the presence of hazardous chemicals in communities directly to the people who are most affected, both in terms of exposure to potential risks and the effects of those risks on public health and safety, the environment, jobs, the local economy, property values, and other factors.

These "stakeholders" are also the people who are best able to do something about assessing and managing risks-through inspections, enforcement of local codes, reviews of facility performance and, when appropriate, political and economic pressures.

This relationship between the Title III data and community action can best occur at the local level, through the work of the LEPC.

For example, if a local firm has reported the presence of extremely hazardous substances at its facility, several accidents, substantial quantities of chemicals, and continuing releases of toxic chemicals, a community has the data it needs to seek appropriate corrective action.

In short, the law opens the door to community-based decision-making on chemical hazards for citizens and communities throughout the nation. This section describes how each of the key groups and organizations--as well as individual citizens--can help to fulfill the promise of the Emergency Planning and Community Right-to-Know Act: a safer, healthier environment for you and your family.

Local Emergency Planning Committees (LEPCs)

Local Emergency Planning Committees, or LEPCs, are crucial to the success of the Emergency Planning and Community Right-to-Know Act.

Appointed by State Emergency Response Commissions (SERCs), local planning committees must consist of representatives of all of the following groups and organizations: elected state and local officials; law enforcement, civil defense, firefighting, first aid, health, local environmental and transportation agencies; hospitals; broadcast and print media; community groups; and representatives of facilities subject to the emergency planning and community right-to-know requirements.

The LEPC's initial task is to develop an emergency plan to prepare for and respond to chemical emergencies.

EPA s list of extremely hazardous substances may provide a focus for setting priorities in your planning effort. The plan is required to be completed by October 17, 1988.

This is only the beginning. The plan must be reviewed annually, tested, and updated.

Because the LEPC's members represent the community, they should be familiar with factors that affect public safety, the environment, and the economy of the community. That expertise will be essential as the LEPC develops a plan tailored to the needs of its planning district.

An emergency plan must include the identity and location of hazardous materials; procedures for immediate response to a chemical accident; ways to notify the public about actions they must take; names of coordinators at plants; and schedules and plans for testing the plan.

Once the plan is written, the SERC must review it. The LEPC must publicize the plan through public meetings or newspaper announcements, get public comments, and periodically test the plan by conducting emergency drills.

The LEPC must also update the plan at least annually and let the public know of its activities.

The LEPC has other responsibilities besides developing an emergency response plan. It receives emergency release and hazardous chemical inventory information submitted by local facilities, and must make this information available to the public upon request. It must establish and publicize procedures for handling those requests.

LEPCs have the authority to request additional information from facilities for their own planning purposes or on behalf of others.

LEPCs may want to visit facilities in the community to find out what they are doing to reduce hazards, prepare for accidents, and reduce hazardous inventories and releases. LEPCs can take civil actions against facilities if they fail to provide the information required under the Act.

In addition to its formal responsibilities, the LEPC serves as a focal point in the community for information and discussions about hazardous substances, emergency planning, and health and environmental risks.

Citizens will expect the LEPC to reply to questions about chemical hazards and risk management actions. It can also anticipate questions about the extent and the health and environmental effects of routine toxic chemical releases.

Even though this information is not required by the law to be sent to LEPCs, EPA and the states are working together to ensure this information is available at the local level.

Many companies are voluntarily providing local committees and other citizens with this information.

An LEPC can most effectively carry out its responsibilities as a community forum by taking steps to educate the public about chemical risks, and working with facilities to minimize those risks.

The value of the information provided by the Emergency Planning and Community Right-to-Know Act will be limited unless citizens are given the means to understand the information and its implications.

The LEPC’s ability to improve the safety and health of its community will be greatly enhanced by the support of an informed and active citizenry.

Citizens

The Emergency Planning and Community Right-to-Know Act was written specifically with you, the citizen, in mind.

It is based on the principle that the more you and your neighbors know about hazardous chemicals in your community, the better prepared your community will be to manage these potential hazards and to improve public safety and health as well as environmental quality. By volunteering to work with your LEPC, you can play a major role in making the law work.

The law requires industry and others to make available to you information on potential chemical hazards and inventories, and on releases of toxic chemicals into the environment.

There are several ways you can become involved in obtaining and using this information to enhance the quality of life in your community:

- **Make sure that your Local Emergency Planning Committee (LEPC) has been formed**, attend its meetings, and make sure it is fully representative of the community. Volunteer to serve on it as a citizen representative.
- Make sure that the LEPC has obtained **all the information it needs** from local facilities to prepare a comprehensive emergency response plan.
- **Review and comment on the emergency response plan**, and ask questions about how procedures set out in the plan affect you, your family, or your place of business.
- **Ask for information** from your LEPC or State Emergency Response Commission (SERC) about chemical hazards, inventories, and releases in your community. Make sure both the SERC and LEPC have established procedures to make the information reported under Title III readily available to the public. Ask your LEPC what facilities are doing to reduce chemical hazards.
- Use the national Toxic Release Inventory (TRI) data base to **obtain information on routine releases of toxic chemicals** in your community. Your LEPC should have this information. If not, you or your LEPC can get the TRI information from a local library, your state, or the EPA Reporting Center in Washington, DC. If you have a home computer and a telephone modem, you can call up the national data base on the National Library of Medicine's TOXNET® computer system (a nominal access fee will be charged.)
- **Call or visit facilities** in your community and ask if they have complied with the reporting requirements.

Under certain conditions, facilities can withhold the name of a chemical on a "trade secret" basis (other information must be provided). You can challenge trade secret claims by submitting a petition to EPA.

Title III also allows you to sue the owner or operator of a business or facility who does not comply with the law, as long as that person is not facing a government administrative order or civil action to force compliance. You can also sue EPA, the SERC or the governor of your state if any of them fails to provide information that must be made public under the Act.

Finally, you can petition EPA to add or delete chemicals from the list of toxic chemicals that must be reported under the toxic chemical release inventory.

You also can petition to change the list of extremely hazardous substances used for emergency planning and accidental release notification.

The Emergency Planning and Community Right-to-Know Act creates a groundbreaking opportunity for you as a citizen to become directly involved in the decisions that affect your safety and health.

Your knowledge of and participation in this program can help ensure that it accomplishes its goals in your community.

Fire Departments

Because fire departments are often the first to respond to a hazardous chemical emergency, they must be involved in every aspect of the emergency planning and community right-to-know program.

Fire departments will be involved in emergency planning through their participation in the work of LEPCs.

It is essential that fire departments are involved in their LEPCs not only to ensure they are a part of the system but because fire departments have important expertise regarding chemical hazards and emergency planning. The community emergency response plan must include hazardous chemical emergency training for response workers, including firefighters. Federal and state programs are available to train firefighters for dealing with emergencies involving chemical hazards.

In addition to participating in emergency planning and training, fire departments will receive information about hazardous chemicals from facilities within their jurisdiction.

This information, in the form of either material safety data sheets (MSDSs) or lists of MSDS chemicals and hazardous chemical inventory forms, will be the same as the data submitted to LEPCs and SERCs.

Having access to this information will help a fire department responding to a chemical emergency know which chemicals, as well as their quantities and locations, to expect at the scene.

The fire department can request additional, more specific information about chemical inventories at a plant, and it can also request an on-site inspection. The plant must provide specific information regarding the location of hazardous chemicals.

In an effort to help fire departments respond to chemical accidents, the National Oceanic and Atmospheric Administration (NOAA) worked with the Seattle, WA, Fire Department to develop the Computer-Aided Management of Emergency Operations (CAMEO II) System.

EPA has helped NOAA expand this program to meet the information management needs of Title III. CAMEO II contains response information and recommendations for 2,629 commonly transported chemicals; an air dispersion model to assist in evaluating release scenarios and evacuation options; and several easily adaptable databases and computational programs that address the emergency planning provisions of the Emergency Planning and Community Right-to-Know Act.

Public Institutions

Public institutions such as hospitals, schools, and state and local governments are vital to the success of any emergency response plan.

Ambulance crews and emergency room personnel must know how to transport and treat victims of exposure to hazardous chemicals.

Schools and public buildings should plan for emergencies and may be called on to serve as emergency shelters for evacuees. Here are some of the other ways public institutions can participate in emergency planning and hazardous chemical risk reduction:

- Representatives of these institutions should be **members of the Local Emergency Planning Committee**, or at least learn who represents public institutions on the committee and stay in contact with that person.
- The institutions' officers should **inform the LEPC of sensitive facilities** within the community (hospitals, schools, and nursing homes) that should be included in the emergency response plan. These officers should know how they will be notified in the event of an accident and be prepared to respond. They should also be familiar with plans for responding to fires and other emergencies involving hazardous chemicals.
- State and local environmental and public health agencies, in addition to participating on SERCs and LEPCs, should take advantage of the new reporting requirements to **build an information base about hazardous chemicals** in their states and communities. This information can then be used to identify "hot spots," or potential problem areas that warrant further investigation to determine if they represent unacceptable risks to the public health or the environment. The agencies also can use this information to work with industry on voluntary programs to reduce the amounts and risks of hazardous chemicals present or released in the community.

Public institutions may be required to submit reports under the following notification requirements of the Act:

- **Emergency Planning**: If a public institution has more than a specified amount of an extremely hazardous substance, it must report to the SERC and LEPC.
- **Emergency Release Notification**: If the institution releases more than a reportable quantity of an extremely hazardous substance, it must immediately report the release to the SERC and LEPC.
- Toxic Chemical Release Reporting: If a public institution operates a manufacturing facility, it could be covered by the toxic chemical release reporting requirements.

Health Professionals

Doctors, nurses, and other trained medical professionals who serve in government health departments, hospitals, and private practice can be a valuable resource in emergency planning and response. They can also be an important source of information about risks to the public health in their communities. Here are some of the ways these professionals can participate in the Emergency Planning and Community Right-to-Know program:

- They can volunteer to be a **health professional representative** on the Local Emergency Planning Committee, or they can offer to assist the LEPC in its work.
- They can participate in programs to **train medical personnel** to deal with emergencies involving chemical hazards (health professionals should contact their state training officer through their LEPC or SERC for more information on training programs).
- They can **screen the information** submitted under Title III to determine if any acute or chronic health effects may be associated with hazardous substances in their communities.

In a more general sense, health professionals may be approached to provide and interpret information on chemicals available under this law. The law allows health professionals to gain access to chemical identity information, even if it is claimed as trade secret, in three different situations:

- If the chemical identity is needed for the diagnosis and treatment of an exposed person.
- If a medical emergency exists in which the chemical identity is needed to aid in diagnosis or treatment.
- If a health professional who is a local government employee requests a chemical's identity to conduct preventive research studies and to render medical treatment.

Except for medical emergencies, the request for a chemical's identity must be accompanied by a written statement of need and a confidentiality agreement.

Industry and Small Businesses

Hazardous substances are not only found at large chemical plants. They are also used routinely in many small operations--garages, dry cleaners, etc. These chemicals are not necessarily hazardous in normal practice but may be of concern if stored or used improperly, or during an emergency such as a fire. Most industrial facilities that use chemicals in the United States are probably subject to one or more provisions of the Emergency Planning and Community Right-to-Know Act. Many small businesses are also required to file reports under the law, although several of the provisions either specifically exempt certain small businesses or have reporting thresholds that make them apply only to larger facilities.

A company's initial responsibility under the Act is to determine whether it has reporting and emergency planning obligations, and if so, to meet those obligations. EPA has prepared a number of guidance documents, a videotape, and other materials to help explain the Act's requirements and to assist companies in filing required reports and participating in their communities' planning process. Industry trade associations, such as the Chemical Manufacturers Association (CMA), also have been active in alerting their member companies to their obligations under Title III.

Besides meeting the strict requirements of the law, some chemical manufacturers and other industries have also taken steps to establish a dialogue with citizens and to involve the public as partners in planning for chemical emergencies and managing chemical risks in their communities. CMA's Community Awareness and Emergency Response (CAER) program is an example of these efforts. EPA encourages all companies affected by Title III to consider similar programs.

The annual toxic chemical release reporting requirement applies only to manufacturing facilities (those in Standard Industrial Classification codes 20-39) with ten or more full-time employees. Therefore, many small businesses will not be subject to this requirement because they do not meet the manufacturing, processing or use thresholds.

All businesses, however, both manufacturing and non-manufacturing, are required to report under the emergency planning, emergency release notification, and hazardous chemical reporting provisions of the act if they have specified chemicals in amounts greater than the threshold quantities for those chemicals.

Beyond these requirements, some companies--both large and small-have taken steps to improve community safety by reducing their stocks of hazardous substances in heavily populated areas. Others are attempting to substantially lower the levels of chemicals they release into the environment. In some cases, these "source reduction" or "pollution prevention" programs have as their goal the virtual elimination of hazardous chemical wastes through substitutions, changes in industrial processes, reuse and recycling, and the use of new technologies to reduce the quantity and toxicity of hazardous substances before they enter the environment. To the extent that industrial facilities and other businesses pursue these efforts, they will be helping to achieve one of the major objectives of the Emergency Planning and Community Right-to-Know Act: a reduction in the amount of hazardous and toxic chemicals stored in the nation's communities and released into the nation's air, water, and soil.

Farmers

The presence of pesticides and fertilizers on a farm can present a potential chemical hazard to the community just as a factory can -- especially if the farm is located near a populated area or near transportation routes. Farmers, therefore, may be subject to one or more of the reporting requirements of the Emergency Planning and Community Right-to-Know Act:

- **Emergency Planning:** Farmers should first determine if they are using any of the 366 "extremely hazardous substances" that trigger the Act's emergency planning reporting requirement. If so, and if one or more of the substances exceeds specified amounts, the farm must alert the SERC and LEPC that it is covered by the emergency planning requirements. The farm must also identify a contact in case the LEPC needs additional information. This information will be used to develop an emergency response plan for the community. Because the circumstances under which farmers have extremely hazardous substances may be different from other businesses, it is important that an agriculture representative be included on the LEPC.
- **Emergency Release Notification:** Generally, farmers must notify their SERCs and LEPCs if there is a release of an "extremely hazardous substance," or a substance listed under the Superfund hazardous waste clean-up law, in excess of its "reportable quantity." There are two exceptions that may exclude farmers from this reporting requirement: First, reporting is required only by facilities that produce, use, or store a "hazardous chemical." Under the definition of a hazardous chemical, substances that are used in routine agricultural operations and household or consumer products are specifically exempt. Even with these exemptions, however, a farm may still have other hazardous chemicals present which would be subject to reporting. If you have a release and are unsure whether or not you need to report it because you don't know whether or not you have a hazardous chemical, you should report it anyway. Second, the proper application of a registered pesticide or fertilizer in accordance with its intended purpose is exempt from emergency release notification. In other words, farmers do not need to report routine pesticide and fertilizer application as emergency releases. An accidental release above a reportable quantity of those substances should be reported.
- **Hazardous Chemical Reporting:** These reporting requirements are tied to the worker right-to-know rules of the Occupational Safety and Health Administration (OSHA), so farmers may be covered if they already must comply with the OSHA regulations. Farms with fewer that ten full-time employees are not covered by OSHA and consequently are exempt from this requirement. Chemicals used in routine agriculture operations and household and consumer products are exempt from reporting because they do not meet the law's definition of hazardous chemicals.
- **Toxic Chemical Release Reporting:** These requirements cover only manufacturing facilities (those in Standard Industrial Classification codes 20-39) with ten or more employees. Thus only farms that are involved in manufacturing operations as a primary activity (such as food, tobacco, or textile manufacturing) would be covered under this section, but only if their use of listed chemicals exceeds the threshold levels for reporting.

State Emergency Response Commissions (SERCs)

The Emergency Planning and Community Right-to-Know Act requires each state to set up a State Emergency Response Commission, or SERC. The 50 states and the U.S. territories and possessions have established these commissions. Indian tribes have the option to function as an independent SERC or as part of the state in which the tribe is located (see box).

In some states, the SERCs have been formed from existing organizations, such as state environmental, emergency management, transportation, or public health agencies. In others, they are new organizations with representatives from public agencies and departments, along with various private groups and associations.

A broad perspective is crucial to the oversight role of the SERCs. Information available under the Act will involve air, water, solid waste, toxics, and other state and federal environmental programs and regulations. Among the SERC's duties are to:

- Designate local emergency planning districts within the state.
- Appoint a local emergency planning committee (LEPC) to serve each of the districts.
- Coordinate and supervise the activities of the local committees, through regular communication and contact.
- Coordinate proposals for and distribution of training grant funds.
- Review local emergency response plans annually, making recommendations for any needed changes.
- Notify EPA of all facilities in the state that are either covered under emergency planning requirements, or have been designated as subject to these requirements by the SERC or the governor.

The SERCs also receive reports and notifications required by the legislation: material safety data sheets (MSDSs) or lists of MSDS chemicals, emergency and hazardous chemical inventory forms, and notices of emergency releases (this data also goes to LEPCs).

The law requires that toxic release inventory information be provided to EPA and to the state, but does not designate any specific state agency. The SERC may be designated to receive these reports, or they may be submitted to the state environmental, health or emergency management agency (in almost every state this agency is a member of the SERC). The designated agency must make the reports available to the public, and it can use them itself in developing and enforcing state environmental and public health programs.

The SERC should provide the forum for coordinating all Title III information, and assisting in understanding and communicating the associated chemical risks.

Indian Tribes

Because of the sovereignty of many Indian tribes, EPA is developing regulations under which federally recognized tribes may act as states, with the same responsibilities as states under the Emergency Planning and Community Right-to-Know Act.

Under a draft policy statement developed by EPA, however, tribes may choose to negotiate agreements with the states in which they are located so that the state assumes some or all of the responsibilities imposed by the law.

People living and working under tribal jurisdiction must follow the same procedures as other persons under the law. In complying, they will need to know whether the tribe will be functioning as the SERC. If so, all reports and information requests must be forwarded to the tribal SERC. If, however, the tribe has chosen to enter into an agreement with a state, the agreement will designate who will receive reports and answer questions. The discussion of the SERC's role, authorities, and responsibilities applies to Indian tribes if the tribe is functioning as a SERC. Questions about this policy may be referred to EPA regional offices. The SERC is also responsible for:

- Establishing procedures for receiving and processing public requests for information collected under the Act.
- Asking for further information from facilities, at the request of the state or another party or at its own discretion, about a particular chemical or facility.
- Requesting information from EPA on the health effects of chemicals that EPA has agreed to designate "trade secret," and ensuring that this information is available to the public.
- Taking civil action against facility owners or operators who fail to comply with reporting requirements.

The SERC should ensure that its state programs are integrated with the federal law in order to strengthen enforcement. The SERC can provide strong leadership, coordination, technical assistance, and training, work closely with LEPCs to help identify their specific needs and carry out their programs, and use its knowledge and expertise to help all affected groups, organizations and individuals meet their responsibilities under the Act.

The Federal Role

States and local communities have the primary governmental responsibility for making emergency planning and community right-to-know work. The federal government, however, also has important contributions to make.

The federal government's major responsibilities in implementing this new law include providing guidance, technical assistance, and training to states, communities, and industry, in addition to enforcing the law to ensure compliance. EPA is also responsible for creating a national data base of toxic chemical releases, making it accessible to citizens, and ensuring that LEPCs have the information they need to take appropriate steps to reduce the risks from accidents and toxic chemical releases in their communities. The federal government also has a variety of responsibilities to regulate certain toxic and hazardous substances under other federal environmental and occupational health and safety laws.

Guidance and Technical Assistance

To help state and local officials as they develop their emergency plans, the National Response Team (NRT) has published the Hazardous Materials Emergency Planning Guide (NRT-1). In addition, EPA, the Federal Emergency Management Agency (FEMA), and the Department of Transportation (DOT) have published a follow-up document on hazards analysis which tells emergency planners how to determine the potential hazards of a chemical and its processes before there is an accident, so they can determine the priorities of chemical risks in their community and plan for them. LEPCs can work with their SERCS and ask their Regional Response Teams to review local emergency plans.

EPA has also published documents to help industry comply with the reporting provisions of Title III, and to help state and local officials manage and analyze the information submitted.

The industry guidance documents are designed to minimize reporting burdens while helping facilities submit accurate information in a format that can be effectively used by the SERCs, LEPCs, local fire departments, and EPA. These documents include both general and industry-specific guidance on estimating releases for the toxic chemical release reporting forms, and information on completing the emergency and hazardous chemical inventory forms.

To help SERCs and LEPCs analyze this information, EPA has developed chemical profiles for extremely hazardous substances which include some health effects and emergency response information. EPA is also distributing fact sheets prepared by the State of New Jersey showing the health and environmental effects to workers of the chemicals on the Toxic Release Inventory (TRI), as well as information on federal and state laws and regulations covering the chemicals.

EPA and FEMA staff are also helping SERCs administer the law by sponsoring workshops, speaking at meetings of SERCs and LEPCs, and providing guidance for developing and testing local emergency plans and managing, understanding, and communicating the information submitted under Title III.

Training

EPA offers a number of training activities m preparing for, responding to, and preventing chemical accidents through the Agency's Environmental Response Team and joint efforts with FEMA, DOT and other federal agencies. Under Section 305 of the Act, FEMA is authorized to provide $5 million a year for fiscal years 1987-1990 in training grants for state and local officials. These grants will be provided through the SERC in each state. The purpose of the grants is to allow states and local communities to gain or improve on the skills necessary for carrying out emergency planning and preparedness programs.

The training grants are earmarked for federal training programs and for developing state-delivered courses for local officials. States must match 20 percent of the funds requested in order to be eligible for the training grants. The training must focus on emergency planning, preparedness, mitigation, response, and recovery capabilities related to emergencies involving hazardous chemicals.

Toxic Chemicals Release Inventory

EPA will compile the computerized Toxic Chemical Release Inventory, and will update the data base semiannually as new information is gathered. The national data base will be available to the public through computer telecommunications and "other means," such as computer-generated microfiche, by the spring of 1989.

Special Studies Required by Title III

- EPA has reviewed existing emergency systems for monitoring, detecting, and preventing releases of extremely hazardous substances, and alerting the public to them. The Agency's report of this review was submitted to Congress m June 1988. It makes recommendations to improve technical capabilities in these areas.
- The National Academy of Sciences will conduct a study of "mass balance" analysis and information, to be completed by 1991. A mass balance compares the amount of a chemical entering a production process with the amount leaving the process, either in products or as waste. The study's purpose is to assess whether mass balance data is useful in estimating releases and waste treatment efficiencies that must be reported on the Toxic Chemical Release Inventory form.
- The General Accounting Office, also by 1991, must report to Congress on the collection and use of data in the Toxic Chemical Release Inventory.

Enforcement

EPA has a major role to play in the enforcement of Title III. The Agency is providing assistance to states and local communities for specific enforcement actions against violators of sections 302, 311, and 312. Since EPA does not receive or process information under these sections, and SERCs and LEPCs do, actions should be initiated at the state and local levels. EPA will assist as much as possible. Under sections 304 and 313, EPA does have a statutory mechanism to receive information directly from submitters. The Agency has already taken the lead in bringing enforcement actions against violators of these sections.

For Further Information

If you are interested in getting involved in your community, or would like more information on how the Emergency Planning and Community Right-to-Know Act is being carried out, please contact your local emergency planning committee. Your SERC can help you locate your local committee.

Your local committee and state commission are the focal points for information submitted under Title III. In addition to answering questions you may have after reading this brochure, they can provide you with information submitted under the law (see box below).

Toxic Release Inventory data can be obtained by contacting EPA in writing:

U.S. EPA, P.O. Box 70266, Washington, DC 20024-0266
Attention: TRI Public Inquiry

Please be specific when identifying the Toxic Release Inventory material you would like to obtain. At a minimum, you should provide the company name, city, and state.

If you have any technical or regulatory questions that your LEPC or SERC is unable to answer, please contact your nearest EPA Regional Office (call the toll-free Emergency Planning and Community Right-to-Know Information Hotline, between 8:30 am and 7:30 pm Eastern time at 800-535-0202 (in Washington, DC, 202-479-2449).

An introductory videotape on Title III, titled "Emergency Planning and Community Right-to-Know: What It Means to You," is also available.

Contact your EPA regional office or write to the Title III Information Hotline for information on how to obtain more copies of this brochure, and how to purchase or borrow the videotape.

Information Available Under Title III	
Information:	**Available From:**
Local Emergency Plans	Local Emergency Planning Committees
Material Safety Data Sheets or Lists of Hazardous Chemicals	Local Emergency Planning Committees State Emergency Response Commissions
Emergency and Hazardous Chemical Inventory Forms	Local Emergency Planning Committees State Emergency Response Commissions
Toxic Chemical Release Inventory Information	Local Emergency Planning Committees State Emergency Response Commissions Designated State Agencies U.S. Environmental Protection Agency

Glossary

- CERCLA (Comprehensive Emergency Response, Compensation, and Liability Act of 1980): The federal statute that authorized "Superfund." Superfund, which is administered by EPA, provides funding for cleanups and emergency response actions for hazardous substances at the worst hazardous waste sites in the United States. CERCLA is also significant because it set the first criteria for notification of emergencies involving hazardous substances.
- EHS (Extremely Hazardous Substance): Any one of 366 hazardous chemicals on a list compiled by EPA to provide a focus for state and local emergency planning activities.
- EPA: U.S. Environmental Protection Agency.
- FEMA: U.S. Federal Emergency Management Agency.
- LEPC: Local Emergency Planning Committee.
- NRC (National Response Center): The central U.S. clearinghouse for information involving emergency spills and other releases of oil and hazardous substances.
- NRT (National Response Team): The national team composed of representatives from 14 federal agencies, with emergency planning and response capabilities, including EPA and FEMA.
- MSDS (Material Safety Data Sheet): A worksheet required by the U.S. Occupational Safety and Health Administration (OSHA) containing information about hazardous chemicals in the workplace; MSDSs are used to fulfill part of the hazardous chemical inventory reporting requirements under the Emergency Planning and Community Right-to-Know Act.
- OSHA: Occupational Safety and Health Administration, part of the U.S. Department of Labor.
- RQ (Reportable Quantity): An amount of a Superfund hazardous substance or "extremely hazardous substance" that, if released, must be reported under the emergency release reporting requirements of the Emergency Planning and Community Right-to-Know Act or under those of CERCLA.
- SARA: Superfund Amendments and Reauthorization Act of 1986.
- SERC: State Emergency Response Commission.
- TPQ (Threshold Planning Quantity): The amount of an extremely hazardous substance present at a facility above which the facility's owner/operator must give emergency planning notification to the SERC and LEPC.
- Title III: The third part of SARA, also known as the Emergency Planning and Community Right-to-Know Act of 1986.
- TRI (Toxic Release Inventory): A national inventory of annual toxic chemical releases from manufacturing facilities.

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HOW TO BETTER PREPARE YOUR COMMUNITY FOR A CHEMICAL EMERGENCY – A Guide for State, Tribal and Local Agencies

HOME

The Emergency Planning and Community Right-to-Know Act (EPCRA) was passed by Congress in 1986 in response to concerns raised by the major industrial accident that occurred in 1984 in Bhopal, India. In that accident, which killed and disabled hundreds of thousands, the public was unaware of the hazardous chemicals in use and stored at the facility and they lacked information on what to do when accidents occur. Soon after, a chemical accident at a facility in Institute, West Virginia in 1985 raised concerns in the U.S. about local preparedness for chemical emergencies and the availability of information on hazardous chemicals.

The need for EPCRA continues today. More recent incidents have occurred, such as the 2013 West, Texas fertilizer facility ammonium nitrate explosion that killed 15 people, the 2010 explosion and fire at Tesoro Refinery in Anacortes, Washington, that killed seven employees, and the 2012 Chevron Refinery hydrocarbon fire in Richmond, California, that affected 15,000 people in the surrounding area. These incidents highlight the need for continued improvement in a number of areas related to chemical facility safety including the need for greater awareness of chemical hazards present in communities, better planning, and appropriate response to chemical incidents.

On August 1, 2013, the White House issued Executive Order (EO) 13650 on Improving Chemical Facility Safety and Security. The Chemical Facility Safety and Security Working Group, established by Executive Order 13650, released the status report entitled Actions to Improve Chemical Facility Safety and Security – A Shared Commitment on June 6, 2014, which includes key considerations identified in the process of implementing the EO. Some of those considerations include:

- Strengthening the state and local infrastructure created by EPCRA for emergency planning and preparedness
  - This infrastructure includes State Emergency Response Commissions (SERCs), Tribal Emergency Response Commissions (TERCs), Local Emergency Planning Committees (LEPCs), and Tribal Emergency Planning Committees (TEPCs)
- Ensuring participation of key stakeholders (i.e., community members, emergency responders and industry) in the planning process
- Engaging chemical facilities in preventing, preparing for, and responding to chemical accidents, and
- Ensuring effective communication and notifications to the community members before, during, and following a chemical accident.

The purpose of EPCRA is to:

- Encourage and support emergency planning efforts at the state, tribal and local levels
- Provide local governments and first responders with information concerning potential chemical hazards present in their planning district
- Prevent, prepare for, and mitigate the effects of a chemical incident, and
- Provide the public with information on chemical risks in their community and information on what to do if a chemical accident occurs.

<table>
<tr><th colspan="4">“What are the functions of the organizations created by EPCRA to protect the community from chemical risks?”</th></tr>
<tr><th>SERCs</th><th>TERCs</th><th>LEPCs</th><th>TEPCs</th></tr>
<tr><td>State Emergency Response Commissions</td><td>Tribal Emergency Response Commissions</td><td>Local Emergency Planning Committees</td><td>Tribal Emergency Planning Committees</td></tr>
<tr><td>SERCs are appointed by the governor of each state to establish LEPCs.</td><td>TERCs are established by the Chief Executive Officer of the Tribe. TERCs have the same responsibilities as SERCs under EPCRA in the tribal region.</td><td>LEPCs are established by the SERC in each state.</td><td>TEPCs are established by the TERC in each tribal region. They have the same responsibilities as LEPCs in the tribal region.</td></tr>
<tr><td colspan="2">Responsibilities include establishing LEPCs (or) TEPCs; reviewing local emergency plan; supervising LEPC (or) TEPC activities; establishing mechanisms for collecting hazardous chemical inventories and information on releases of chemicals from facilities; and establishing procedures for processing public information requests.</td><td colspan="2">Responsibilities include preparing chemical emergency response plan and reviewing the plan annually or more frequently as necessary; coordinating responses to emergency releases serving as a focal point in the community for providing information and holding discussions about chemical risks in the community; and establishing procedures for processing public information requests.</td></tr>
</table>

OVERVIEW OF EPCRA REQUIREMENTS		
Emergency Planning	**Hazardous Chemical Inventory Reporting**	**Emergency Release Notification**
Section 302, the emergency planning provisions of EPCRA, requires facilities to provide notification of the presence of extremely hazardous substances (EHSs) on their sites. Facilities must also provide a representative who will serve as the facility emergency coordinator to the LEPC or TEPC and participate in local emergency planning activities. The LEPCs and TEPCs use this information to develop or modify local emergency response plans as required under Section 303. Section 303 authorizes LEPCs and TEPCs to request any information that is needed to develop or update their emergency plans from facilities subject to Section 302 requirements.	Sections 311 and 312 of EPCRA contain provisions for hazardous chemical inventory reporting, also known as community right-to-know reporting. Facilities that handle hazardous chemicals, defined under the Occupational Safety and Health Act and its implementing regulations, above set threshold amounts are required to provide information on the chemicals, their quantities, locations, and potential hazards. Section 311 requires facilities to submit a Material Safety Data Sheet, MSDS (or Safety Data Sheet, SDS) for each hazardous chemical, or a list of hazardous chemicals, present at or above the reporting thresholds specified in the implementing regulations. Section 312 requires that facilities submit an inventory of these hazardous chemicals (Tier II form) annually by March 1st. The MSDSs or list of chemicals and Tier II form are submitted to the SERC (or TERC), LEPC (or TEPC), and the local fire department. Information submitted on the Tier II form may also be useful to LEPCs and TEPCs in their planning process since it provides information on other hazardous chemicals as well as EHSs present at the facilities in their community.	Facilities are required to provide immediate notification to the SERCs, TERCs, LEPCs and TEPCs of any releases of EHSs and hazardous substances listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Soon after a release, facilities are required to provide a written follow-up with additional information regarding the release. The immediate notification and follow-up reports will include: the name and quantity of the chemical released; the media to which the chemical was released; known or anticipated acute or chronic health risks; proper precautions to take (e.g., evacuation or shelter-in-place); actions taken to respond to and contain the release; and advice regarding medical attention necessary for exposed individuals. LEPCs and TEPCs can use this information to improve their local emergency plan to better prepare for a chemical incident. An actual incident can be used to evaluate and measure the effectiveness of the emergency plan. Effectiveness may be determined by how well the response was undertaken and how the emergency situation was communicated to responders and the community.

Roles and Responsibilities under EPCRA

SERCs and TERCs

SERCs and TERCs are required to establish emergency planning districts, appoint LEPCs and TEPCs, and supervise and coordinate all activities of the LEPCs and TEPCs in their state or tribal region. SERCs and TERCs should ensure that each planning district has an emergency plan and that emergency exercises are conducted at least once a year.

SERCs and TERCs must review the plan and make recommendations to improve the plan, as well as ensure that each LEPC or TEPC plan is coordinated with the plans of neighboring emergency planning districts.

SERCs and TERCs should assist LEPCs and TEPCs with community meetings to discuss emergency plans and understand the chemical risks.

Designation of Additional Facilities Subject to Emergency Planning

While the emergency planning provisions in EPCRA are limited to EHSs and the facilities that handle them, other chemicals and facilities may also pose danger to the community in an emergency.

Section 302 authorizes SERCs and TERCs to designate additional facilities subject to emergency planning notification. SERCs and TERCs could consider naming individual sites or companies, or designate certain classes of facilities as ways to expand the number of facilities included in the planning process after public notice and opportunity for comment.

EPA encourages SERCs and TERCs to use this authority so these additional facilities and the chemicals they handle would also be subject to emergency planning. This would require these facilities to participate in the local emergency planning process and provide information on chemical risks at their facility. LEPCs and TEPCs would be able to include these facilities also in their emergency plan.

LEPCs and TEPCs

LEPCs and TEPCs play a key role in meeting the goals of EPCRA. They are required to develop and implement an emergency plan for their community, as well as to ensure that the people in the community are aware of the chemical risks and know what to do if a chemical accident occurs.

It is important that the members of the LEPC or TEPC represent all stakeholders in their community. EPCRA states that LEPC or TEPC membership shall include, at a minimum, representatives from these entities:

- Elected state and local officials, Law enforcement
- Civil defense, Transportation
- Broadcast and print media, Hospital
- Fire fighters, First aid
- Local environmental, Health
- Community groups, Facility owners and/or operators

Representatives from each of these organizations play an important role in developing the local emergency plan and protecting the public during chemical emergencies.

For many communities, a successful LEPC or TEPC acts as a forum to support the overall emergency management program within the community.

Stakeholders bring their specific expertise and talents into the planning process to ensure all elements of the plan are appropriately addressed.

For example, facility owners and operators who know and understand the chemical risks at their facility can assist the LEPC or the TEPC in identifying actions to take in order to prepare for and respond to a chemical accident.

Members of the public also have a role to play in assisting the LEPC or the TEPC in understanding the unique needs of the community regarding communication about the chemical risks and emergency response procedures. For example, individuals with special medical needs, such as the elderly, disabled/handicapped, children, and those with transportation challenges.

Tailoring outreach to meet the specific considerations of the local community is key to enabling effective participation in the planning process and an efficient response to ensure safety of the public.

LEPCs and TEPCs must appoint a chairperson and establish rules by which the committee shall function. Rules shall include:

- Public notification of committee activities, and
- Public meetings to discuss the emergency plan, public comments, response to such comments by the committee, and distribution of the emergency plan.

The emergency plan should include:

- Facilities that handle EHSs and transportation routes of EHSs, as well as any facilities designated by the SERC or TERC
- Emergency response procedures for facility owners and operators, as well as for local emergency and medical personnel
- Designation of a community and a facility emergency coordinator to implement the plan
- Procedures for notifying the public and the local emergency response team that a release has occurred
- Methods for determining the occurrence of a chemical release
- Determination of the probable area and population affected by potential releases, including considerations of environmental justice, vulnerable residents, fence-line communities, etc.
- Identification of emergency response equipment in the community and at the facilities in the community, and the persons responsible for them (including identification of the response capabilities of regulated facilities)
- Evacuation plans (including evacuation routes and shelter-in-place procedures)
- Training program for emergency responders (including schedules)
- Methods and schedules for exercising emergency response plan.

An incident in one community may affect other communities. LEPCs and TEPCs should consult with other LEPCs and TEPCs near their emergency planning districts to coordinate planning efforts and potential mutual response support during an incident.

Additionally, LEPCs and TEPCs should consider the unique challenges of industrial parks (i.e., clustering of facilities) and their potential for impacts to adjacent facilities and fence-line communities.

LEPCs and TEPCs are required to review the emergency plan at least once a year or more frequently when changes occur in the community. To accomplish this, LEPCs and TEPCs should meet regularly to review and exercise the plan and update it as necessary. Conducting emergency plan exercises are important to ensure that the plan includes all necessary elements and any gaps or areas that need improvement are identified. Emergency plan exercises would benefit emergency responders to be better prepared for an incident.

Developing an Emergency Response Plan

With the information obtained from facilities under Section 302, LEPCs and TEPCs are required to develop the local emergency response plan for their community. There are approximately 90,000 facilities covered by Section 302. EPCRA authorizes LEPCs and TEPCs to obtain any information from these facilities necessary to develop or update the emergency response plan. Necessary information includes identification of chemicals of concern, identification of serious events that can lead to releases, amounts of toxic material or energy that could be released, predicted consequences of the release and associated damages, and prevention measures in place at the facility.

Emergency Planning for Hazardous Chemicals reported under the Community Right-to-Know sections of EPCRA

With approximately 400,000 facilities reporting under Section 311 and 312, the chemical information provided by these facilities offers a wealth of additional information that can be useful to first responders, LEPCs, and TEPCs in the local planning process.

LEPCs and TEPCs should use information received under Sections 311, 312, and 302 to develop, implement, and update the emergency response plan. It is critically important that first responder organizations make full use of the chemical hazard information for appropriate training and to minimize the risks to fire-fighters, medics and hazmat teams when responding to an emergency.

The Tier II form under Section 312 requires specific information on facilities that handle hazardous chemicals. Beyond the requirements for specific information about the facility (e.g., the address of the location where hazardous chemicals are stored, latitude and longitude, maximum number of occupants, and whether the facility is manned or unmanned), the form now requires facilities to provide contact information for the facility emergency coordinator.

This one-time notification required under Section 302 was originally provided by the facilities that existed when the law was passed in 1986.

Requirements to update this information may have been overlooked by some facilities; they are now required to report this information annually on the Tier II form.

In addition to the emergency contact information, facilities are required to provide contact information for the person responsible for the content of the Tier II form. The additional requirements on the Tier II form were published in the Federal Register notice on July 12, 2012 (77 FR 41314), effective January 1, 2014.

Regarding chemical information, the Tier II form requires facilities to report specific information on hazardous chemicals, such as the amounts (in ranges), locations, and the potential hazards related to those chemicals.

This information can supplement the information provided by facilities under Section 302 for local emergency planning. It can assist LEPCs and TEPCs in updating their emergency plan.

Additionally, some facilities should have an emergency plan in place for potential chemical accidents at their facility.

One important issue to address in the local emergency plan is to ensure that either the facility itself or the public emergency responders have the capabilities to respond to a chemical release at a facility.

LEPCs and TEPCs should use all information received under EPCRA and from chemical facilities to assist them in developing an emergency response plan that addresses chemical risks to the community.

Emergency Planning for Substances in Transportation

Although EPCRA provides an exemption for facilities from reporting substances in transportation for emergency planning purposes, chemicals in transportation or facilities that are involved in chemical transportation operations should also be included in the local emergency plan.

Section 303 requires LEPCs and TEPCs to identify transportation routes of EHSs as part of the planning process. LEPCs and TEPCs should consider including substances other than EHSs in transportation. Many transportation-related incidents involved other substances which have adversely affected the community and require response actions to be taken by local responders.

Some recent incidents involving crude oil transported by rail have significantly impacted communities. These incidents compelled the federal government to implement more protective regulations.

The US Department of Transportation issued an Emergency Order (USDOT Emergency Order on Transport of Bakken Crude Oil) requiring railroads that operate trains moving large quantities to notify the SERCs and TERCs about the operation of these trains through their states or tribes.

As of June 2014, SERCs began to receive such notifications under this EO. TERCS may reach out to SERCs to obtain information on trains operating through the tribal lands.

SERCs and TERCs should be sharing the information with local emergency planners and responders so that LEPCs and TEPCs can include these operations in the local emergency plan. On May 28, 2015 the DOT announced that the Emergency Order will remain in full force and effect until further notice while the DOT considers options for codifying the Order disclosure requirement.

The DOT notice is available: http://www.phmsa.dot.gov/hazmat/phmsa-notice-regarding-emergency-response-notifications-for-shipments-of-petroleum-crude-oil-by-rail.

LEPCs and TEPCs should use their authority provided in Section 303 to request information from facilities for substances that may be in transportation through their community. This will allow emergency responders to be prepared for any chemical-related transportation incident.

Tools for Planning and Response

Facilities subject to EPCRA requirements submit their reports to the SERCs, TERCs, LEPCs, TEPCs and their local fire department. Reports include the amount (in ranges), locations and potential hazards of chemicals present on site.

To assist state, tribal, and local agencies in collecting, managing, and using this information, EPA and the National

Oceanic and Atmospheric Administration (NOAA) created the Computer-Aided Management of Emergency Operations (CAMEO). CAMEO is a system of software applications used to plan for and respond to chemical emergencies.

CAMEO assists chemical emergency planners and responders to access, store, and evaluate information critical for developing emergency plans. There are four integrated programs within CAMEO:

- Facility and chemical data management
- Chemical properties and hazards
- Air dispersion modeling
- Mapping application

Fire Departments Role in Emergency Planning

Representatives of the fire service play a key role in implementing EPCRA. Since fire departments are often the first to respond to an emergency, they should be active in the emergency planning process for their community. EPCRA Sections 311 and 312 require facilities to submit MSDSs (or SDSs) or a list of hazardous chemicals along with the Tier II form to their local fire department and to the SERC (or TERC) and LEPC (or TEPC).

Having access to this information enables fire departments that respond to chemical emergencies to know which chemicals, as well as their quantities and locations they can expect to find at the scene.

Fire departments should inspect facilities that handle hazardous chemicals using the authority provided under Section 312.

As part of an on-site inspection, facilities are required to provide location information of all hazardous chemicals present at the facility.

Fire departments are encouraged to use this authority to understand the chemical risks at each facility in order to appropriately respond to those risks. As noted above, it is critically important that first responder organizations make full use of the chemical hazard information for appropriate training and to minimize the risks to fire-fighters, medics and hazmat teams when responding to an emergency.

It is also important to keep an open dialogue with facility personnel to ensure facility participation in the development and implementation of the local emergency plan. Facilities subject to emergency planning under Section 302 are required to provide the name of a facility representative to participate in the planning process.

Facilities subject to Section 312 Tier II reporting are required to appoint an emergency contact who can be reached in the event of an incident to assist the fire fighters.

These facility representatives can help the fire department in planning and fostering communication before and during response to an incident. Facilities in your community may offer training, technical assistance and resources for responding to chemical emergencies.

Collaboration and Outreach with Stakeholders

Working with Chemical Facilities on planning and prevention

There may be facilities in the community that are not aware of EPCRA and its reporting requirements. SERCs, TERCs, LEPCs and TEPCs should reach out to facilities in their community. Outreach could include compliance workshops and electronic media.

Many SERCs and LEPCs have published EPCRA outreach materials to educate facilities and the public. EPA encourages collaboration through outreach to facilities to illustrate the importance of public safety and the need to comply with EPCRA, as well as steps that can be taken to prevent chemical accidents.

These steps could include reducing inventories of chemicals, reducing shipments or adjusting transportation routes away from vulnerable populations, and working with adjacent chemical facilities to reduce the potential for “domino” effects from a chemical accident.

With regard to enforcement efforts, if facilities fail to comply, then SERCs, TERCs, LEPCs and TEPCs may use the authority provided in EPCRA Section 326 to file civil enforcement action against facilities. SERCs, TERCs, LEPCs and TEPCs may also refer facilities to EPA to take enforcement action, if necessary.

Engaging the Community

LEPCs and TEPCs serve as a community focal point for information and discussion about hazardous substances, emergency planning, and health and environmental risks. Engaging and educating the community is an important part of meeting the goals of EPCRA, especially for those members of the community identified in the local response plan that could be directly affected by the impacts of a chemical accident. Section 301 contains provisions for LEPCs and TEPCs to notify the public of its activities and hold public meetings to discuss the emergency plan with the community, educate the public about chemical risks, and share information on what is to be done during an emergency (i.e., evacuation or shelter-in-place). LEPCs and TEPCs are responsible for ensuring that procedures are in place for notifying the public when a chemical accident occurs (via reverse 911 or other system) and ensuring that the public understands what to do when they receive that information. To facilitate this, LEPCs and TEPCs should encourage the public and community groups to become LEPC or TEPC members, participate in the planning process, and promote participation in emergency exercises. Additionally, LEPCs and TEPCs should consider focused outreach (i.e., addressing language and cultural issues) to vulnerable, sensitive, and low income members of the community to assist them in effectively participating in the local planning meetings, understanding risk issues, and what to do when an accident occurs.

ENGAGING FACILITIES

LEPCs / TEPCs should educate facilities that are unaware of EPCRA reporting requirements and provide assistance to facilities to comply with EPCRA reporting requirements. In addition, LEPCs/TEPCs should work with facilities to identify actions which could be taken to reduce chemical risks to the community.

Ways in which LEPCs / TEPCs can reach out to facilities is by sending letters, as well as brochures and outreach materials to facilities in your community that cover the requirements of EPCRA - including penalties for non-compliance. Outreach may also include holding public meetings or workshops for local facilities to explain the reporting process and the information which is needed for reporting, as well as participating in the development of the local emergency plan.

In addition, LEPCs / TEPCs should encourage facility owners and operators to become members of the LEPC / TEPC and be a part of the planning process. Facilities are prime resources to assist LEPCs / TEPCs in explaining potential chemical risks to the community.

Another approach to gather needed facility and chemical information is for LEPCs / TEPCs to use questionnaires requesting facilities to provide information on available resources, emergency response training held at the facilities, emergency response equipment, and so forth. This information is invaluable during the LEPC / TEPC emergency planning process.

Public Access to Information under EPCRA

SERCs, TERCs, LEPCs and TEPCs receive reports and notifications under EPCRA from facilities covered under the requirements. EPCRA requires that this information be made available to the public. Fence-line Communities located close to chemical facilities will find this information useful to help them understand chemical risks and prepare for chemical accidents. Information that would be most helpful includes:

- The local response plan that identifies the potential chemical risks to their community and response actions to be taken;
- How the public will receive information on these risks, as well as how they will receive notification when a chemical accident occurs; and
- What they need to do to prepare for a chemical accident and how to protect themselves once they receive the notification that a chemical accident has occurred.

SERCs, TERCs, LEPCs and TEPCs are required to establish procedures for processing and receiving requests from the public as well as providing that information to community members. Procedures may include setting-up a reading room, establishing hours of operation, determining if copies of the reports can be made, and determining if service fees will be charged.

THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

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On December 4, 1984, methyl isocyanate, an extremely toxic chemical escaped from a Union Carbide chemical plant in Bhopal, India. Thousands died and many more were injured. Some suffered permanent disabilities. Approximately six months later, a similar incident occurred at the Institute, West Virginia. These two events raised concern about local preparedness for chemical emergencies and the availability of information on hazardous chemicals.

In response to these concerns, Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment.

What Are SERCs, TERCS, and LEPCs?

The Governor of each state designated a State Emergency Response Commission (SERC). The SERCs, in turn, designated about 3,500 local emergency planning districts and appointed Local Emergency Planning Committees (LEPCs) for each district. The SERC supervises and coordinates the activities of the LEPC, establishes procedures for receiving and processing public requests for information collected under EPCRA, and reviews local emergency response plans.

The Chief Executive Office of the Tribe appoints the Tribal Emergency Response Commissions (TERCs). TERCs have the same responsibilities as the SERCs.

The LEPC membership must include, at a minimum, local officials including police, fire, civil defense, public health, transportation, and environmental professionals, as well as representatives of facilities subject to the emergency planning requirements, community groups, and the media. The LEPCs must develop an emergency response plan, review it at least annually, and provide information about chemicals in the community to citizens.

What Does EPCRA Cover?

EPCRA has four major provisions:

- Emergency planning (sections 301-303),
- Emergency release notification (section 304),
- Hazardous chemical storage reporting requirements (sections 311-312), and
- Toxic chemical release inventory (section 313).

Information collected from these four requirements helps states and communities develop a broad perspective of chemical hazards for the entire community, as well as for individual facilities. Regulations implementing EPCRA are codified in Title 40 of the Code of Federal Regulations, parts 350 to 372. The chemicals covered by each of the sections are different, as are the quantities that trigger reporting. Table 1 summarizes the chemicals and thresholds.

What Are Emergency Response Plans (Sections 301-303)?

Emergency Response plans contain information that community officials can use at the time of a chemical accident. Community emergency response plans for chemical accidents were developed under section 303. LEPCs are required to update these plans annually. The plans must:

- Identify facilities and transportation routes of extremely hazardous substances;
- Describe emergency response procedures, on and off site;
- Designate a community coordinator and facility coordinator(s) to implement the plan;
- Outline emergency notification procedures;
- Describe how to determine the probable affected area and population by releases;
- Describe local emergency equipment and facilities and the persons responsible for them;
- Outline evacuation plans;
- Provide a training program for emergency responders (including schedules); and,
- Provide methods and schedules for exercising emergency response plans.

Planning activities of LEPCs and facilities initially focused on, but were not limited to, the 406 extremely hazardous substances (EHSs) listed by EPA in 1987 (now currently 355 chemicals).The list includes the threshold planning quantities (minimum limits) for each substance. Any facility that has EHS at or above its threshold planning quantity must notify the State Emergency Response Commission (SERC) or the Tribal Emergency Response Commission (TERC) and Local Emergency Planning Committee (LEPC) within 60 days after they first receive a shipment or produce the substance on site.

What Are the Emergency Notification Requirements (Section 304)?

Facilities must immediately notify the LEPC and the SERC or the TERC if there is a release into the environment of a hazardous substance that is equal to or exceeds the minimum reportable quantity set in the regulations. This requirement covers the 355 extremely hazardous substances, as well as the more than 700 hazardous substances subject to the emergency notification requirements under CERCLA section 103(a)(40 CFR 302.4). Some chemicals are common to both lists. Initial notification can be made by telephone, radio, or in person. Emergency notification requirements involving transportation incidents can be met by dialing 911, or in the absence of a 911 emergency number, calling the operator. This emergency notification needs to include:

- The chemical name;
- An indication of whether it is an extremely hazardous substance;
- An estimate of the quantity released into the environment;
- The time and duration of the release;
- Whether the release occurred into air, water, and/or land;
- Any known or anticipated acute or chronic health risks associated with the emergency, and where necessary, advice regarding medical attention for exposed individuals;
- Proper precautions, such as evacuation or sheltering in place; and,
- Name and telephone number of contact person.

A written follow-up notice must be submitted to the SERC or the TERC and LEPC as soon as practicable after the release. The follow-up notice must update information included in the initial notice and provide information on actual response actions taken and advice regarding medical attention necessary for citizens exposed.

What Are the Community Right-to-know Requirements (Sections 311 and 312)?

Under Occupational Safety and Health Administration (OSHA) regulations, employers must maintain a material safety data sheet (MSDS) for any hazardous chemicals stored or used in the work place. Approximately 500,000 products are required to have MSDSs.

Section 311 requires facilities that have MSDSs for chemicals held above certain threshold quantities to submit either copies of their MSDSs or a list of these chemicals to the SERC or TERC, LEPC, and local fire department. If the facility owner or operator chooses to submit a list of chemicals, the list must include the chemical or common name of each substance and must identify the applicable hazard categories. These hazard categories are:

- Immediate (acute) health hazard;
- Delayed (chronic) health hazard;
- Fire hazard;
- Sudden release of pressure hazard; and
- Reactive hazard.

If a list is submitted, the facility must submit a copy of the MSDSs for any chemical on the list upon request by the LEPC. Facilities that start using a hazardous chemical or increase the quantity to exceed the thresholds must submit MSDSs or a list of MSDSs chemicals within three months after they become covered. Facilities must provide a revised MSDS to update the original MSDS or list if significant new information is discovered about the hazardous chemical.

Facilities covered by section 311 must submit annually an Emergency and Hazardous Chemical Inventory Form to the LEPC, the SERC or the TERC, and the local fire department as required under section 312. Facilities provide either a Tier I or Tier II inventory form. Tier I inventory form include the following aggregate information for each applicable hazard category:

- An estimate (in ranges) of the maximum amount of hazardous chemicals for each category present at the facility at any time during the preceding calendar year;
- An estimate (in ranges) of the average daily amount of hazardous chemicals in each category; and,
- The general location of hazardous chemicals in each category. The Tier II inventory form contains basically the same information as the Tier I, but it must list the specific chemicals. Tier II inventory form provide the following information for each chemical:
- The chemical name or the common name as indicated on the MSDS;
- An estimate (in ranges) of the maximum amount of the chemical present at any time during the preceding calendar year and the average daily amount;
- A brief description of the manner of storage of the chemical;
- The location of the chemical at the facility; and
- An indication of whether the owner elects to withhold location information from disclosure to the public.

Many states now require Tier II inventory form or the state equivalent including electronic reporting under state law. Section 312 information must be submitted on or before March 1 each year for information on chemicals present at the facility in the previous year. The information submitted under sections 311 and 312 is available to the public from LEPCs and SERCs or TERCs.

What is the Toxics Release Inventory (Section 313)?

Section 313 of EPCRA established the Toxics Release Inventory. TRI tracks the management of certain toxic chemicals that pose a threat to human health and the environment. Facilities in different industry sectors must annually report how much of each chemical they managed through recycling, energy recovery, treatment and environmental releases. TRI reporting forms must be submitted to EPA and the appropriate state or tribe by July 1 of each year. These forms cover environmental releases and other management of toxic chemicals that occurred during the previous calendar year.

The information submitted by facilities is compiled in the Toxics Release Inventory and made available to the public through the TRI website: www.epa.gov/tri. TRI helps support informed decision-making by industry, government, non-governmental organizations and the public. TRI includes information about:

- On-site releases (including disposal) of toxic chemicals to air, surface water and land;
- On-site recycling, treatment and energy recovery associated with TRI chemicals;
- Off-site transfers of toxic chemicals from TRI facilities to other locations;
- Pollution prevention activities at facilities;
- Releases of lead, mercury, dioxin and other persistent, bioaccumulative and toxic (PBT) chemicals; and
- Facilities in a variety of industry sectors (including manufacturing, metal mining and electric power generation) and some federal facilities.

A complete list of covered facilities is available online: http://www.epa.gov/tri/lawsandregs/naic/ncodes.htm. Some of the ways TRI data can be used include:

- Identifying sources of toxic chemical releases;
- Beginning to analyze potential toxic chemical hazards to human health and the environment; and
- Encouraging pollution prevention at facilities.

Table 1: EPCRA Chemicals and Reporting Thresholds

Chemicals Covered	Section 302 355 Extremely Hazardous Substances	Section 304 >1,000 substances	Sections 311/312 Approximately 500,000 hazardous chemicals	Section 313 > 650 Toxic Chemicals and categories
Thresholds	Threshold Planning Quantity 1-10,000 pounds on site at any one time	Reportable quantity 1-5,000 pounds, released in a 24-hour period	500 pounds or TPQ whichever is less for EHSs; gasoline greater than or equal to 75,000 gallons (all grades combined)*; diesel greater than or equal to 100,000 gallons (all grades combined)*; 10,000 pounds for all other hazardous chemicals	25,000 pounds per year manufactured or processed; 10,000 pounds a year otherwise used; persistent bioaccumulative toxics have lower thresholds

*These thresholds are only applicable for gasoline and diesel present at retail gas stations in tank(s) entirely underground and was in compliance at all times during the preceding calendar year with all applicable Underground Storage Tank (UST) requirements at 40 CFR part 280 or requirements of the state UST program approved by the Agency under 40 CFR part 281.

What Else Does EPCRA Require?

Trade Secrets. EPCRA section 322 allows facilities to file trade secrets in their reports under EPCRA sections 303, 311, 312, and 313. Only the specific chemical identity may be claimed as a trade secret, though a generic class for the chemical must be provided. The criteria a facility must meet to claim a chemical identity as a trade secret are in 40 CFR part 350. A facility cannot claim trade secrets under EPCRA section 304.

Even if specific chemical identity information can be legally withheld from the public, EPCRA section 323 allows the information to be disclosed to health professionals who need the information for diagnostic and treatment purposes or local health officials who need the information for prevention and treatment. In non-emergency cases, the health professional must sign a confidentiality agreement with the facility and provide a written statement of need. During a medical emergency, the health professional may obtain the specific chemical identity from the facility for treatment.

Any person may challenge trade secret claims by petitioning EPA. The Agency must then review the claim and rule on its validity. EPCRA Penalties. EPCRA section 325 allows civil and administrative penalties ranging up to $10,000 - $75,000 per violation or per day per violation when facilities fail to comply with the reporting requirements. Criminal penalties up to $50,000 or five years in prison apply to any person who knowingly and willfully fails to provide emergency release notification. Penalties of not more than $20,000 and/or up to one year in prison apply to any person who knowingly and willfully discloses any information entitled to protection as a trade secret.

Citizens Suits. EPCRA section 326 allows citizens to initiate civil actions against EPA, SERCs, and the owner or operator of a facility for failure to meet the EPCRA requirements. A SERC or TERC, LEPC, and state or local government may institute actions against facility owner or operator for failure to comply with EPCRA requirements. In addition, states may sue EPA for failure to provide trade secret information.

Reporting Schedules	
Section	
302	One time notification to SERC / TERC and LEPC.
3004	Each time a release above a reportable quantity of an EHS or CERCLA Hazardous Substance occurs to LEPC and SERC or TERC.
311	One time submission of MSDS or list of hazardous chemicals. An update is required for new chemicals or new information about chemicals already submitted to the SERC or TERC, LEPC, and the fire department with jurisdiction over the facility.
312	Annually, by March 1 to SERC or TERC, LEPC, and the fire department with jurisdiction over the facility.
313	Annually, by July 1, to EPA, states and tribes.

Where Can You Find EPCRA Information?

Regulations, policy memorandums, answers to frequently asked questions related to EPCRA sections 301 to 312 can be obtained from: www.epa.gov/emergencies/content/epcra/index.htm.

MSDSs, hazardous chemical inventory forms, follow-up emergency notices, and the emergency response plan are available from the SERC or the TERC and LEPC.

EPA has compiled a list of all chemicals covered under these regulations into a single list and published them as The Title III List of Lists, which is available online: www.epa.gov/emergencies/tools.htm#lol.

Each year, EPA publishes the TRI National Analysis, a report summarizing the most recent TRI data. TRI data are available through a variety of online tools and applications at www.epa.gov/tri/tridata. Users can search TRI data by year, facility name, geographic location, chemical of interest and industry sector.

Initial emergency release notifications made to the National Response Center or EPA are available online: www.nrc.uscg.mil/nrchp.html.

Are There Other Laws That Provide Similar Information?

The Oil Pollution Act (OPA) of 1990 includes national planning and preparedness provisions for oil spills that are similar to EPCRA provisions for extremely hazardous substances. Plans are developed at the local, state and federal levels. The OPA plans offer an opportunity for LEPCs to coordinate their plans with area and facility oil spill plans covering the same geographical area.

The 1990 Clean Air Act Amendments require the EPA and OSHA to issue regulations for chemical accident prevention. Facilities that have certain chemicals above specified threshold quantities are required to develop a risk management program to identify and evaluate hazards and manage those hazards safely. Facilities subject to EPA's Chemical Accident Prevention regulations must submit a risk management plan (RMP) summarizing its program.

EPA 550-F-00-004, March, 2000

HOME

THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) establishes requirements for Federal, State and local governments, Indian Tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment.

What Does EPCRA Cover?

EPCRA has four major provisions:

- Emergency planning (Section 301-303),
- Emergency release notification (Section 304),
- Hazardous chemical storage reporting requirements (Sections 311-312), and
- Toxic chemical release inventory (Section 313).

Information gleaned from these four requirements will help States and communities develop a broad perspective of chemical hazards for the entire community as well as for individual facilities. Regulations implementing EPCRA are codified in Title 40 of the Code of Federal Regulations, parts 350 to 372. The chemicals covered by each of the sections are different, as are the quantities that trigger reporting. Table 1 on the next page summarizes the chemicals and thresholds.

What Are Emergency Response Plans (Sections 301-303)?

Emergency Response plans contain information that community officials can use at the time of a chemical accident. Community emergency response plans for chemical accidents were developed under section 303. The plans must:

- Identify facilities and transportation routes of extremely hazardous substances;
- Describe emergency response procedures, on and off site;
- Designate a community coordinator and facility coordinator(s) to implement the plan;
- Outline emergency notification procedures;
- Describe how to determine the probable affected area and population by releases;
- Describe local emergency equipment and facilities and the persons responsible for them;
- Outline evacuation plans;
- Provide a training program for emergency responders (including schedules); and,
- Provide methods and schedules for exercising emergency response plans.

Planning activities of LEPCs and facilities initially focused on, but were not limited to, the 356 extremely hazardous substances listed by EPA. The list includes the threshold planning quantities (minimum limits) for each substance. Any facility that has any of the listed chemicals at or above its threshold planning quantity must notify the SERC and LEPC within 60 days after they first receive a shipment or produce the substance on site.

What Are SERCs and LEPCs?

The Governor of each state designated a State Emergency Response Commission (SERC). The SERCs, in turn, designated about 3,500 local emergency planning districts and appointed Local Emergency Planning Committees (LEPCs) for each district. The SERC supervises and coordinates the activities of the LEPC, establishes procedures for receiving and processing public requests for information collected under EPCRA, and reviews local emergency response plans.

The LEPC membership must include, at a minimum, local officials including police, fire, civil defense, public health, transportation, and environmental professionals, as well as representatives of facilities subject to the emergency planning requirements, community groups, and the media. The LEPCs must develop an emergency response plan, review it at least annually, and provide information about chemicals in the community to citizens.

What Are the Emergency Notification Requirements (Section 304)?

Facilities must immediately notify the LEPC and the SERC if there is a release into the environment of a hazardous substance that is equal to or exceeds the minimum reportable quantity set in the regulations. This requirement covers the 356 extremely hazardous substances as well as the more than 700 hazardous substances subject to the emergency notification requirements under CERCLA Section 103(a)(40 CFR 302.4). Some chemicals are common to both lists. Initial notification can be made by telephone, radio, or in person. Emergency notification requirements involving transportation incidents can be met by dialing 911, or in the absence of a 911 emergency number, calling the operator. This emergency notification needs to include:

- The chemical name;
- An indication of whether the substance is extremely hazardous;
- An estimate of the quantity released into the environment;
- The time and duration of the release;
- Whether the release occurred into air, water, and/or land;
- Any known or anticipated acute or chronic health risks associated with the emergency, and where necessary, advice regarding medical attention for exposed individuals;
- Proper precautions, such as evacuation or sheltering in place; and,
- Name and telephone number of contact person.

A written follow-up notice must be submitted to the SERC and LEPC as soon as practicable after the release. The follow-up notice must update information included in the initial notice and provide information on actual response actions taken and advice regarding medical attention necessary for citizens exposed.

Table 1: EPCRA Chemicals and Reporting Thresholds				
	Section 302	**Section 304**	**Sections 311/312**	**Section 313**
Chemicals Covered	356 extremely hazardous substances	>1,000 substances	500,000 products	650 toxic chemicals and categories
Thresholds	Threshold Planning Quantity 1-10,000 pounds on site at any one time	Reportable quantity, 1-5,000 pounds, released in a 24-hour period	TPQ or 500 pounds for Section 302 chemicals; 10,000 pounds on site at any one time for other chemicals	25,000 pounds per year manufactured or processed; 10,000 pounds a year used; certain persistent bioaccumulative toxics have lower thresholds

What Are the Community Right-to-know Requirements (Sections 311/312)?

Under Occupational Safety and Health Administration (OSHA) regulations, employers must maintain a material safety data sheet (MSDS) for any hazardous chemicals stored or used in the work place. Approximately 500,000 products have MSDSs.
Section 311 requires facilities that have MSDSs for chemicals held above certain quantities to submit either copies of their MSDSs or a list of MSDS chemicals to the SERC, LEPC, and local fire department. If the facility owner or operator chooses to submit a list of MSDS chemicals, the list must include the chemical or common name of each substance and must identify the applicable hazard categories. These hazard categories are:
- Immediate (acute) health hazard;
- Delayed (chronic) health hazard;
- Fire hazard;
- Sudden release of pressure hazard; and
- Reactive hazard.

If a list is submitted, the facility must submit a copy of the MSDSs for any chemical on the list upon the request of the LEPC or SERC.

Facilities that start using a chemical or increase the quantity to exceed the thresholds must submit MSDSs or a list of MSDSs chemicals within three months after they become covered. Facilities must provide a revised MSDS to update the original MSDS if significant new information is discovered about the hazardous chemical.

Facilities covered by section 311 must, under section 312, submit annually an emergency and hazardous chemical inventory form to the LEPC, the SERC, and the local fire department. Facilities provide either a Tier I or Tier II form. Tier I forms include the following aggregate information for each applicable hazard category:
- An estimate (in ranges) of the maximum amount of chemicals for each category present at the facility at any time during the preceding calendar year;
- An estimate (in ranges) of the average daily amount of chemicals in each category; and,
- The general location of hazardous chemicals in each category.
- The Tier II report contains basically the same information as the Tier I, but it must name the specific chemicals. Many states require Tier II information under state law. Tier II forms provide the following information for each substance:
- The chemical name or the common name as indicated on the MSDS;
- An estimate (in ranges) of the maximum amount of the chemical present at any time during the preceding calendar year and the average daily amount;
- A brief description of the manner of storage of the chemical;
- The location of the chemical at the facility; and
- An indication of whether the owner elects to withhold location information from disclosure to the public.

Because many SERCs have added requirements or incorporated the Federal contents in their own forms, Tier I/II forms should be obtained from the SERC. Section 312 information must be submitted on or before March 1 each year. The information submitted under sections 311 and 312 is available to the public from LEPCs and SERCs.

In 1999, EPA excluded gasoline held at most retail gas stations from EPCRA 311/312 reporting. EPA estimates that about 550,000 facilities are now covered by EPCRA 311/312 requirements.

Reporting Schedules	
Section	
302	One time notification to SERC
304	Each time a release above a reportable quantity occurs; to LEPC and SERC
311	One time submission; update only for new chemicals or information; to SERC, LEPC, fire department
312	Annually, by March 1 to SERC, LEPC, fire department
313	Annually, by July 1, to EPA and State

What is the Toxics Release Inventory (Section 313)?

EPCRA section 313 (commonly referred to as the Toxics Release Inventory or TRI) requires certain facilities (see box) to complete a Toxic Chemical Release Inventory Form annually for specified chemicals. The form must be submitted to EPA and the State on July 1 and cover releases and other waste management of toxic chemicals that occurred during the preceding calendar year. One purpose of this reporting requirement is to inform the public and government officials about releases and other waste management of toxic chemicals. The following information is required on the form:

- The name, location and type of business;
- Whether the chemical is manufactured (including importation), processed, or otherwise used and the general categories of use of the chemical;
- An estimate (in ranges) of the maximum amounts of the toxic chemical present at the facility at any time during the preceding year;
- Quantity of the chemical entering the air, land, and water annually;
- Off-site locations to which the facility transfers toxic chemicals in waste for recycling, energy recovery, treatment or disposal; and
- Waste treatment/disposal methods and efficiency of methods for each waste stream;

In addition, the Pollution Prevention Act of 1990 requires collection of information on source reduction, recycling, and treatment. EPA maintains a national TRI database, available on the Internet (see the Where Can I Find EPCRA Information? section for further details).

Who's Covered by TRI?

The TRI reporting requirement applies to facilities that have 10 or more full-time employees, that manufacture (including importing), process, or otherwise use a listed toxic chemical above threshold quantities, and that are in one of the following sectors:

- Manufacturing (Standard Industrial Classification (SIC) codes 20 through 39)
- Metal mining (SIC code 10, except for SIC codes 1011,1081, and 1094)
- Coal mining (SIC code 12, except for 1241 and extraction activities)
- Electrical utilities that combust coal and/or oil (SIC codes 4911, 4931, and 4939)
- Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste treatment and disposal facilities (SIC code 4953)
- Chemicals and allied products wholesale distributors (SIC code 5169)
- Petroleum bulk plants and terminals (SIC code 5171)
- Solvent recovery services (SIC code 7389)

What Else Does EPCRA Require?

Trade Secrets. EPCRA section 322 addresses trade secrets as they apply EPCRA sections 303, 311, 312, and 313 reporting; a facility cannot claim trade secrets under section 304 of the statute. Only chemical identity may be claimed as a trade secret, though a generic class for the chemical must be provided. The criteria a facility must meet to claim a chemical identity as a trade secret are in 40 CFR part 350. In practice, less than one percent of facilities have filed such claims.

Even if chemical identity information can be legally withheld from the public, EPCRA section 323 allows the information to be disclosed to health professionals who need the information for diagnostic and treatment purposes or local health officials who need the information for prevention and treatment activities. In non-emergency cases, the health professional must sign a confidentiality agreement with the facility and provide a written statement of need. In medical emergencies, the health professional, if requested by the facility, provides these documents as soon as circumstances permit.

Any person may challenge trade secret claims by petitioning EPA. The Agency must then review the claim and rule on its validity.

EPCRA Penalties. EPCRA Section 325 allows civil and administrative penalties ranging up to $10,000-$75,000 per violation or per day per violation when facilities fail to comply with the reporting requirements. Criminal penalties up to $50,000 or five years in prison apply to any person who knowingly and willfully fails to provide emergency release notification. Penalties of not more than $20,000 and/or up to one year in prison apply to any person who knowingly and willfully discloses any information entitled to protection as a trade secret.

Citizens Suits. EPCRA section 326 allows citizens to initiate civil actions against EPA, SERCs, and the owner or operator of a facility for failure to meet the EPCRA requirements. A SERC, LEPC, and State or local government may institute actions against facility owner/ operators for failure to comply with EPCRA requirements. In addition, States may sue EPA for failure to provide trade secret information.

Where Can You Find EPCRA Information?

MSDSs, hazardous chemical inventory forms, follow-up emergency notices, and the emergency response plan are available from the SERC and LEPC.

MSDSs on hazardous chemicals are maintained by a number of universities and can be accessed through www.hazard.com.

EPA also provides fact sheets and other information on chemical properties through its website: www.epa.gov. EPA has compiled a list of all chemicals covered by name under these regulations into a single list and published them as The Title III List of Lists available at www.epa.gov/ swercepp/ds-epds.htm#title3.

Profiles of extremely hazardous substances are available at www.epa.gov/ceppo/ep_chda.htm#ehs

Each year, EPA publishes a report summarizing the TRI information that was submitted to EPA and States during the previous year. In addition, TRI data are available through EPA's Envirofacts database at www.epa.gov/ enviro. TRI data are also available at www.epa.gov/tri, www.rtk.net, and www.scorecard.org.

All of these sites can be searched by facility, city, county, and state and provide access to basic TRI emissions data. The RTK-Net site, maintained by the public advocacy group OMB Watch, provides copies of the full TRI form for each facility. The Scorecard site, maintained by the Environmental Defense public advocacy group, ranks facilities, States, and counties on a number of parameters (e.g., total quantities of carcinogens released) as well as maps that show the locations of facilities in a county or city.

Initial emergency release notifications made to the National Response Center or EPA are available on line at www.epa.gov/ernsacct/pdf/index.html.

A list of LEPCs and SERCs is available at http:// www.RTK.NET:80/lepc/.

Many of these sites can also be accessed through www.epa.gov/ceppo/.

Are There Other Laws That Provide Similar Information?

The Oil Pollution Act (OPA) of 1990 includes national planning and preparedness provisions for oil spills that are similar to EPCRA provisions for extremely hazardous substances. Plans are developed at the local, State and Federal levels. The OPA plans offer an opportunity for LEPCs to coordinate their plans with area and facility oil spill plans covering the same geographical area.

The 1990 Clean Air Act Amendments require the EPA and OSHA to issue regulations for chemical accident prevention. Facilities that have certain chemical above specified threshold quantities are required to develop a risk management program to identify and evaluate hazards and manage those hazards safely. Facilities subject to EPA's risk management program rules must submit a risk management plan (RMP) summarizing its program. Most RMP information is available through RMP*Info, which can be accessed through www.epa.gov/enviro.

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SARA TITLE III FACT SHEET -- EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

HOME

Overview

The Emergency Planning and Community Right-to-Know Act of 1986 establishes requirements for Federal, State and local governments and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals.

This law builds upon EPA's Chemical Emergency Preparedness Program (CEPP) and numerous state and local programs aimed at helping communities to better meet their responsibilities in regard to potential chemical emergencies. The Community Right-to-Know provisions will help to increase the public's knowledge and access to information on the presence of hazardous chemicals in their communities and releases of these chemicals into the environment.

States and communities, working with facilities, will be better able to improve chemical safety and protect public health and the environment.

Nothing in this document should be construed to indicate that EPA has determined states have Title III authority over Indian reservations. For purposes of this document, definition of the terms "State" and "Governor" includes "Indian Tribe" and "Tribal Chairman." EPA has issued a final rule on July 26, 1990, regarding the application of the Emergency Planning and Community Right-to-Know law to Indian lands.

The Emergency Planning and Community Right-to-Know Act (also known as SARA Title III or EPCRCA provisions has four major sections: emergency planning (Section 301-303), emergency release notification (Section 304), community Right-to-know reporting requirements (Sections 311, 312) and toxic chemical release inventory (Section 313).

Information from these four reporting requirements will help States and communities develop a broad perspective of chemical hazards for the entire community as well as for individual facilities.

Section 301-303: Emergency Planning

This emergency planning sections are designed to develop State and local governments' emergency response and preparedness capabilities through better coordination and planning, especially within the local community.

State Emergency Response Commission

The Emergency Planning and Community Right-to-know Act required the Governor of each state to designate a State Emergency Response Commission (SERC).

Many SERCs include public agencies and departments concerned with issues relating to environment, natural resources, emergency services, public health, occupational safety, and transportation.

Also, interested public and private sector groups and associations with experience in emergency planning and Community Right-to-Know issues may be included in the State commission.

At this time, all governors have established SERCs. The SERC must also have designated local emergency planning districts and appointed Local Emergency Planning Committees (LEPC) for each district. SERCs have designated over 4,000 local districts.

Thirty-five State commissions chose counties as me basic district designation (often with separate districts for municipalities) and ten SERCs designated sub-state planning districts.

The SERC is responsible for supervising and coordinating the activities of the LEPC, for establishing procedures for receiving and processing public requests for information collected under other sections of SARA Title III, and for reviewing local emergency plans.

Local Emergency Planning Committees

This LEPC must include, at a minimum elected state and local officials, police, fire, civil defense, public health professionals, environmental, hospital, and transportation officials as well as representatives of facilities subject to the emergency planning requirements, community groups, and the media.

As soon as facilities are subject to the emergency planning requirements, they must designate a representative to participate in the planning process.

The LEPC is required to complete a number of tasks, including establishing rules, giving public notice of its activities, and establishing procedures for handling public requests for information; however, the LEPC's primary responsibility is to develop an emergency response plan by October 17, 1988 and review it at least annually thereafter.

In developing this plan, the LEPC evaluates available resources for preparing for and responding to a potential chemical accident. The plan must:

- identify facilities and transportation mutes of extremely hazardous substances;
- describe emergency response procedures, onsite and off-site;

- designate a community coordinator and facility coordinator(s) to implement the plan;
- outline emergency notification procedures;
- describe methods for determining the occurrence of a release and the probable affected area and population;
- describe community and industry emergency equipment and facilities and identify the persons responsible for them;
- outline evacuation plans;
- describe a training program for emergency response personnel (including schedules); and,
- present methods and schedules for exercising emergency response plans.

Rulemaking in the Federal Register		
April 22, 1987	301-303	EPA published final List of Extremely Hazardous Substances and Threshold Planning Quantities as well as Find Rule for Sections 302, 303, and 304 of the law.
October 15, 1987	311-312	EPA published final format for emergency inventory forms and reporting requirement as well the Final Rule for Sections 311 and 312 of the law.
December 17, 1987	301-303	EPA published a Final Rule delisting four chemicals from the Extremely Hazardous substance List
February 16, 1988	313	EPA Published the final Toxic chemical Release forms and instructions as well as the Final Rule for Section 313 of the law.
February 25, 1988	301-303	EPA Published a Final Rule delisting 36 chemicals from the Extremely Hazardous Substance List.
July 29, 1988	322	EPA published a Final Rule governing trade secret claims.
January 23, 1989	301-303	EPA published a Proposed Rule designating several Extremely Hazardous Substances as CERCLA Hazardous Substances.
January 26, 1989	325	EPA Published a Proposed Rule governing policies and procedures for Citizens Suits under the law.
July 24, 1990	304	EPA published a Final Rule for the continuous release reporting regulation, under which the SERCs' and LEFCS will receive both initial telephone notifications and written reports about the continuous release.
July 26, 1990	311-312	EPA published a Final Rule to the reporting requirements for Sections 311 and 312.
August 27, 1990	301-304	EPA published an Advanced Notice of Proposed Rulemaking seeking comments on a proposal to specify criteria that would be used to add chemicals to the Extremely Hazardous substances list
September 25, 1991	313	EPA published a proposed rule on the additional requirements under Section 313 as mandated by the Pollution Prevention Act
NOTE: The middle column denotes the section of the Title III law which applies to the rulemakings la the Federal Register. These are not all-inclusive		

Emergency Response Plans

In order to assist the LEPCs in preparing and reviewing plans, Congress required the National Response Team (NRT), composed of 15 Federal agencies with emergency response responsibilities, to publish guidance on emergency response planning.

This guidance, the "Hazardous Materials Emergency Planning Guide, (NRT-1)" was published by the NRT in March 1987. In 1990, the NRT also published "Developing a Hazardous Materials Exercise Program: A Handbook for State and Local Officials (NRT-2)" to help assist SERCs and LEPCs exercise their emergency response plans.

The emergency response plan must be initially reviewed by the SERC and, at least, annually by the LEPC. Regional Response Teams (RRTs), composed of federal regional officials and state representatives, may review the plans and provide assistance to the LEPCs upon request by the SERC or LEPC.

Planning activities of LEPCs and facilities should be initially focused on, but not limited to, the 360 extremely hazardous substances published in the Federal Register.

Plans should be comprehensive, addressing all hazardous materials of concern and transportation as well as fixed facilities.

The list includes the threshold planning quantities (minimum limits) for each substance (see Code of Federal Regulations (CFR) Part 40, Section 355). Through rulemaking, EPA can revise the list and threshold planning quantities based on the toxicity, reactivity, volatility, dispersability, combustibility, or flammability of a substance.

Any facility that has present any of, the listed chemicals in a quantity equal to or greater than its threshold planning quantity is subject to the emergency planning requirements.

In addition, the SERC or the Governor can designate additional facilities, after public comment, to be subject to these requirements.

Covered facilities must notify the SERC and LEPC that they are subject to these requirements within 60 days after they begin to have present any of the extremely hazardous substances in an amount equal to or in excess of threshold planning quantities.

In addition, the SERC must notify the EPA regional office of all facilities subject to the emergency planning requirements, including facilities designated by the SERC or the governor.

Section 304: Emergency Notification

Facilities must immediately notify the LEPCs and the SERCs likely to be affected if there is a release into, the environment of a hazardous substance that exceeds the reportable quantity for that substance.

Substances subject to this requirement are those on the list of 360 extremely hazardous substances as published in Federal Register (40 CFR 355) as well as the more than 700 hazardous substances subject to the emergency notification requirements under CERCLA Section 103(a) (40 CFR 302.4).

Some chemicals ate common to both lists. The CERCLA hazardous substances also require notification of releases to the National Response Center (NRC), which alerts federal responders.

Initial notification can be made by telephone, radio, or in person.

Emergency notification requirements involving transportation incidents can be met by dialing 911, or in the absence of a 911 emergency number, calling the operator.

This emergency notification needs to include:

- The chemical name;
- An indication of whether the substance is extremely hazardous;
- An estimate of the quantity released into the environment;
- The time and duration of the release;
- Whether the release occurred into air, water, and/or land
- Any known or anticipated acute or chronic health risks associated with the emergency, and where necessary, advice regarding medical attention for exposed individuals;
- Proper precautions, such as evacuation or sheltering in place; and,
- Name and telephone number of contact person.

Section 304 also requires a written follow-up emergency notice as soon as practicable after the release. The follow-up notice or notices must:

- Update information included in the initial notice, and
- Provide information on
    - o actual response actions taken; and
    - o advice regarding medical attention necessary for exposed individuals.

If LEPCs are not yet formed, releases should be reported to appropriate local response officials.

Section 311-312: Community Right-to-Know Requirements

There are two community Right-to-Know reporting requirements within the Emergency Planning and Community Right-to-Know Act Section 311 requires facilities that must prepare material safety data sheets (MSDS) under the Occupational Safety and Health Administration (OSHA) regulations to submit either copies of their MSDSs or a list of MSDS chemicals to:

- The LEPC,
- The SERC, and,
- The local fire department with jurisdiction over the facility.

If the facility owner or operator chooses to submit a list of MSDS chemicals, the list must include the chemical or common name of each substance and must identify the applicable hazard categories.

These hazard categories are:

- Immediate (acute) health hazard,
- Delayed (chronic) health hazard
- Fire hazard,
- Sudden release of pressure hazard, and,
- Reactive hazard.

If a list is submitted, the facility must submit a copy of the MSDS for any chemical on the list upon the request of the LEPC or SERC.

Also, EPA has established threshold quantities for hazardous chemicals below which no facility must report.

The current thresholds for Section 311 are:

- For extremely hazardous substances: 500 pounds or the threshold planning quantity, whichever is lower.
- For all other hazardous chemicals: 10,000 pounds.

The initial submission of the MSDSs or a list of MSDS chemicals was due on October 17, 1987, or three months after the facility is required to prepare or have available an MSDS under OSHA regulations.

Currently, OSHA regulations require all employers to have or prepare MSDSs for their chemicals.

Under the Emergency Planning and Community Right-to-Know statute, facilities newly covered by the OSHA regulations must submit MSDSs or a list of MSDS chemicals within three months after they become covered.

An MSDS or a revised list must be provided when new hazardous chemicals become present at a facility in quantities at or above the established threshold levels after the deadline.

A revised MSDS must be provided to update the original MSDS if significant new information is discovered about the hazardous chemical.

Reporting under section 312 requires a facility to submit an emergency and hazardous chemical inventory form to the LEPC, the SERC, and the local fire department with jurisdiction over the facility. Hazardous chemicals covered by section 312 are those for which facilities are required to prepare or have available an MSDS under OSHA's Hazardous Communication Standard and that were present at the facility at any time during the previous calendar year above specified thresholds.

The specific threshold quantities established by EPA for Section 312 for hazardous chemicals, below which no facility must report, are:

- For extremely hazardous substances: 500 pounds or the threshold planning quantity, whichever is lower.
- For all other hazardous chemicals: 10,000 pounds.

The inventory form incorporates a "two-tier" approach. Under Tier I, facilities must submit the following aggregate information for each applicable hazard category:

- An estimate (in ranges) of the maximum amount of chemicals for each category present at the facility at any time during the preceding calendar year,
- An estimate (in ranges) of the average daily amount of chemicals in each category; and,
- The general location of hazardous chemicals in each category.

The Tier II report contains basically the same information as the Tier I, but it must name the specific chemical if requested by an LEPC, SERC, or local fire department, the facility must provide the following Tier II information for each substance subject to the request:

- The chemical name or the common name as indicated on the MSDS,
- An estimate (in ranges) of the maximum amount of the chemical present at any time during the preceding calendar year,
- A brief description of the manner of storage of the chemical,
- The location of the chemical at the facility, and,
- An indication of whether the owner elects to withhold location information from disclosure to the public.

EPA published a uniform format for the inventory forms on October 15, 1987.

However, because many state commissions have additional requirements or have incorporated the federal contents in their own forms, Tier I/II forms should be obtained from the SERC.

The Tier I information must be submitted for covered facilities on or before March 1 annually.

The Tier II form may be sent by the facility instead of a Tier I form.

EPA believes that Tier II reports provide emergency planners and communities with more useful information and encourages facilities to submit Tier II forms.

The public may also request Tier II information from the SERC and the LEPC.

The information submitted by facilities under Sections 311 and 312 must generally be made available to the public by LEPCs and SERCs during normal working hours.

Section 313: Toxic Chemical Release Reporting

Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 requires EPA to establish an inventory of routine toxic chemical emissions from certain facilities.

Facilities subject to this reporting requirement are required to complete a Toxic Chemical Release Inventory Form (Form R) for specified chemicals.

The form must be submitted to EPA and those state officials designated by the governor annually on July 1.

These reports should reflect releases during the preceding calendar year.

The purpose of this reporting requirement is to inform the public and government officials about routine releases of toxic chemicals to the environment.

It will also assist in research and the development of regulations, guidelines, and standards.

The reporting requirement applies to owners and operators of facilities that have 10 or more full-time employees, that are in Standard Industrial Classification (SIC) codes 20 through 39 (i.e., manufacturing facilities) and that manufacture (including importing), process, or otherwise use a listed toxic chemical in excess of specified threshold quantities.

Facilities manufacturing or processing any of these chemicals in excess of 25,000 pounds are required to submit the form by July 1st of the following calendar year.

Facilities otherwise using listed toxic chemicals in quantities over 10,000 pounds in a calendar year are required to submit toxic chemical release forms by July 1 of the following calendar year.

EPA can revise these threshold quantities and covered SIC codes.

The list of toxic chemicals subject to reporting consisted initially of chemicals listed for similar reporting purposes by the States of New Jersey and Maryland.

There are over 300 chemicals and categories on these lists. Through rulemaking, EPA can modify this combined list.

The final Toxic Chemical Release Form and regulations were published in the Federal Register on February 16, 1988. (NOTE: EPA has revised and updated the Toxic Chemical Release Form since that time) The following information is required on the form:

- The name, location and type of business;
- Off-site locations to which the facility transfers toxic chemicals in waste for recycling, energy recovery, treatment or disposal,
- Whether the chemical is manufactured (including importation), processed or otherwise used and the general categories of use of the chemical;

- An-estimate (in ranges) of the maximum amounts of the toxic chemical present at the facility at any time during the preceding year,
- Quantity of the chemical entering each medium-air, land, and water-annually;
- Waste treatment/disposal methods and efficiency of methods for each waste stream;
- Some reduction and recycling activities; and,
- A certification by a senior facility official that the report is complete and accurate

Reports are sent to EPA and designated state agencies. EPA established and maintains a national toxic chemical inventory based on the data submitted.

The public is able to access this national database and obtain the data through other means. See the Public Access Section of this document for further details.

Pollution Prevention Law

The Pollution Prevention Act of 1990 has significantly expanded the Toxics Release Inventory (TRI).

It requires collection of mandatory information on source reduction, recycling, and treatment beginning with the 1991 reporting year.

The new requirements include reporting of the following information:

- Amounts released or disposed on-site or offsite, the quantities from the previous year, the quantities anticipated for the next two years;
- Amounts recycled on-site and sent off-site for recycling, the quantities from the previous year, the quantities anticipated for the next two years;
- Amounts mated on-site and sent off-site for treatment the quantities from the previous year, and the quantities anticipated for the next two years;
- Amounts used for energy recovery on-site and sent off-site, quantities from the previous year, and the quantities anticipated for the next two years;
- Types of source reduction practices implemented and the techniques used to identify those practices;
- Methods of recycling used on-site;
- Production ratio or activity index to track changes in the level of economic activity at a facility; and
- Amount of releases resulting from one-time events not associated with production processes.

Other SARA Title III Provisions

Trade Secrets

Section 322 of the Emergency Planning and Community Right-to-Know Act addresses trade secrets as they apply to emergency planning, Community Right-to-Know, and toxic chemical release reporting.

A facility may withhold the specific chemical identity on these submittals. No trade secrets are allowed to be claimed under Section 304 of the statute. The withholder must show that:

- The information has not been disclosed to any person other than a member of the local planning committee, a government official, an employee of the withholder or someone bound by a confidentiality agreement; measures have been taken to protect the confidentiality; and the withholder intends to continue to take such measures;
- The information is not required to be disclosed to the public under any other Federal or State law;
- Disclosure of the information is likely to cause substantial harm to the competitive position of the withholder; and
- The chemical identity is not readily discoverable through reverse engineering.

However, even if chemical identity information can be legally withheld from the public, section 323 provides for disclosure of this information to health professionals who need the information for diagnostic and treatment purposes or local health officials who need the information for prevention and treatment activities.

In non-emergency cases, the health professional receiving the information must sign a confidentiality agreement with the facility and provide a written statement of need.

In medical emergency situations, the health professional must if requested by the facility, provide these documents as soon as circumstances permit.

Information claimed as a trade secret and substantiation for that claim must be submitted to EPA.

More detailed information on the procedure for submitting trade secrecy claims can be found in the trade secrets final rule, published in the Federal Register, July 29, 1988 (40 CFR 350). Any person may challenge trade secret claims by petitioning EPA.

The Agency must then review the claim and rule on its validity.

The trade seat regulations cover the process for submission of Claims, petitions fop disclosure, and the review process for petitions.

SARA Title III Penalties

Section 325 of the Emergency Planning and Community Right-to-Know Act addresses the penalties for failure to comply with the requirements of this law.

Civil and administrative penalties ranging up to \$10,000-\$75,000 per violation or per day per violation can be assessed to facilities that fail to comply with the emergency planning (section, 302), emergency notification (section 304), Community Right-to-Know (sections 311 and 312), toxic chemical release (section 313), and trade secret (Sections 322 and 323) reporting requirements.

Criminal penalties up to $50,000 or five years in prison may also be given to any person who knowingly and willfully fails to provide emergency release notification.

Penalties of not more than $20,000 and/or up to one year in prison may be given to any person who knowingly and willfully discloses any information entitled to protection as a trade secret.

In addition, section 326 allows citizens to initiate civil actions against EPA, state emergency response commissions, and/or the owner or operator of a facility for failure to meet the requirements of the emergency planning and Community Right-to-Know provisions; A state emergency response commission, local emergency planning committee, state or local government may institute actions against facility owner/operators for failure to comply with Title III requirements.

In addition, states may sue EPA for failure to provide trade secret information.

Training Grants

Section 305(a) of the Emergency Planning and Community Right-to-Know Act authorized the Federal Emergency Management Agency to provide $5 million for each of fiscal years 1987, 1988, 1989, and 1990 for training grants to support state and local governments.

These training grants continue to be funded past 1990. These training grants are designed to improve emergency planning, preparedness, mitigation, response, and recovery capabilities. Such programs must provide special emphasis to hazardous chemical emergencies. The training grants may not exceed 80 percent of the cost of any such programs. The remaining 20 percent must come from non-federal sources.

These training grants are coordinated within each state by the state emergency response commission.

Public Access

Section 324 of the Emergency Planning and Community Right-to-Know Act provides for public access to information gathered under this law. Under this section, all material safety data sheets, hazardous chemical inventory forms, toxic chemical release inventory forms, toxic chemical release form follow-up emergency notices, and the emergency response plan must be made available during normal working hours by the SERC and LEPC.

In order to inform the public of the availability and location of the information provided to the LEPC, the LEPC must publish a notice annually in the local newspaper.

In addition, Toxic Release Inventory (Section 313) information collected by EPA is available by telecommunications and other means. This information can be accessed through a variety of sources. Each year, EPA releases a printed report summarizing the information that was submit for the annual Toxic Release Inventory.

A computerized on-line database of the Toxic Release Inventory data is available through the National Library of Medicine's TOXNET on-line system 24 hours a day.

The complete Toxic Release Inventory on magnetic tape is available from the National Technical Information Service (NTIS) and the Government Printing Office (GPO).

The 1987 TRI and pertinent Hazardous Substance Fact Sheets containing reference material on the health and ecological effects of the regulated substances is available on CD-ROM from both NTIS and GPO.

Also available through NTIS and GPO are floppy diskettes containing state specific Toxic Release Inventory information.

Interested parties may view the 1987 Toxic Release Inventory data on microfiche at selected Federal Depository and public libraries.

The list of libraries is also available from NTIS and GPO. Both state and national sets of microfiche can also be purchased from NTIS and GPO.

Most of these products are updated on an annual basis; therefore be sure to indicate which year's TRI data you would like.

Related Legislation

The Oil Pollution Act (OPA) of 1990 includes national planning and preparedness provisions for oil spills that are similar to SARA Title III provisions for extremely hazardous substances. Plans are to be developed at the local, State and federal levels. The OPA offers an opportunity for LEPCs to coordinate their Title plans with area and facility oil spill plans covering the same geographical area.

The Hazardous Materials Transportation Uniform Safety Act (HMTUSA) includes funding grants to States for planning and hazmat training, as well as requiring the development of a national curriculum for training for responders.

States must certify that they are complying with SARA Title III sections 301 and 303, and must pass through at least 75 percent of their planning grant directly to LEPCs; training grants to States and Indian tribes are to be used for training public sector employees in hazmat response and 7596 of the training grant money must go to benefit the local responders.

The Clean Air Act Amendments require the EPA and the Occupational Safety and Health Administration (OSHA) to develop regulations for chemical safety management.

Facilities that have certain chemicals above specified threshold quantities will be required to develop a system to identify and evaluate hazards and manage those hazards safely. Information facilities develop on their hazards must be submitted to States and local emergency planners and available to the public.

The Pollution Prevention Act represents a fundamental shift in the traditional approach to pollution control. Instead of concentrating on the treatment and disposal of wastes, it focuses on source reduction. Specific provisions affect section 313 reporting and are described above.

Chemical Lists Associated With Emergency Planning and Community Right-to-Know		
List	**Section**	**Purpose**
• List of Extremely Hazardous Substances (40 CFR 355)	• §302 Emergency Planning • §304: Emergency Notification • §311/312: Material Safety Data Sheets and Emergency Inventory	• Facilities with more than threshold planning quantities of these substances must notify the SERC and LEPC. • Initial focus for preparation of emergency plans by local emergency planning committees. • Certain releases of these substances in excess of the reportable quantity (RQ) trigger section 304 notification to SERC and LEPC. • Separate and lower thresholds are established for these substances of concern for the MSDS and Tier I/II (section 311/312) reporting requirements.
• Substances requiring notification under Section 103 (a) of CERCLA (40 CFR 302.4)	• §304: Emergency Notification	• Certain releases of these substance: in excess of the RQ trigger section 304 notification to SERC and LEPC as well as section 103(a) requirements for National Response Center notification.
• Hazardous Chemicals considered physical or health hazards under OSHAs Hazard Communication Standard (29 CFR 1910.1200) (This is a performance standard; there is no list of chemicals.)	• §304: Emergency Notification • §311: Material Safety Data Sheets • $312: Emergency and Hazardous Chemical Inventory	• Identifies facilities subject to emergency notification requirements. • MSDS or list of MSDS chemicals provided by covered facilities to SERC, LEPC and local fire departments. • Tier I/II hazardous chemical inventory forms must be provided by facilities to SERC, LEPC and local fire departments.
• Toxic Chemicals • More than 300 chemicals and categories) (40 CFR 372)	• §313: Toxic Chemical Release Reporting	• These chemicals are reported on a Toxic Release Inventory to inform government officials and the public about the release of toxic chemicals into the environment

WHEN ALL FAILS! ENFORCEMENT OF THE EMERNGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

HOME

A Self-Help Manual for Local Emergency Planning Committees

Does your emergency plan address the key preparedness problems in your area? Do your first responders know what chemical hazards they face when arriving at the scene of an emergency? Has missing information limited your emergency preparedness?

Have all affected facilities reported? What steps are you planning to take in the future to improve emergency preparedness? What can you do to ensure that facilities are complying with the law?

During the next few years, many Local Emergency Planning Committees (LEPCs) will look to improve the quality of their communities' chemical emergency response plans and to reduce chemical risks.

One of the most significant ways to improve overall planning is to ensure that all the facilities have reported and, where appropriate, are participating in the emergency planning process. Only then can the local community completely understand and prepare for potential chemical accidents.

The Emergency Planning and Community Right-to-know Act (EPCRA or SARA Title III) grants specific state and local authority to request information from facilities and to take enforcement actions in those situations where voluntary compliance has not occurred.

This pamphlet contains information on these authorities and provides tips to help LEPCs ensure that facilities covered by SARA Title III are complying with the law. The material presented outlines the enforcement authorities granted to citizens, local governments, States, and EPA.

Under this law, facilities that store extremely hazardous substances are required to report the presence of those substances and participate in the planning process. Your experience may indicate that there are facilities in your community that have not yet come forward with the required information. As an LEPC, you have many options for promoting voluntary compliance or compelling compliance.

What is the role of the LEPC in obtaining compliance? This question can only be answered by the LEPC itself. The Act offers many opportunities and obligations. It also provides enforcement mechanisms. In addition, citizens may compel you to obtain information for them.

How actively you choose to pursue these opportunities or how you will respond to citizen inquiries will depend on your situation. As you work to implement the program, you will find that some facilities have not complied with the law.

There will be two main reasons. Either the facility was unaware that it was subject to the law, or the facility simply did not report based on the assumption it would not be found and penalized.

As LEPCs, you may find the lack of cooperation from some facilities frustrating. You can do something about it – you have options. You may want to take an enforcement action or work with the State and EPA to enforce the provisions of the Act.

What is the role of the SERC? Under SARA Title III, the State Emergency Response Commission (SERC) is the focal point for emergency planning at the State level. You should look upon your SERC as a resource that can provide support. The law requires SERCs to provide oversight and coordination of LEPCs. They will be able to serve as your link to State law enforcement and emergency management offices. They should also be your link to the federal government (i.e., EPA) for enforcement requests.

Why does facility noncompliance matter? Facility compliance with reporting requirements is central to what the Act is all about: emergency preparedness and right-to-know. Since the enactment of SARA Title III in 1986, LEPCs across the country have spent considerable time and energy assessing the chemical hazards in their communities.

To a great degree, this planning has enhanced the safety of the emergency responders and citizens of the community. Yet, many facilities still present unnecessary risks to those who arrive first on the scene of a chemical accident and to the community by not providing the required information on chemical use and storage.

The quality of your plan may be compromised by the missing information. The safety of your local fire fighters may be in jeopardy because a facility has not complied. Additionally, a facility that refuses to cooperate or that fails to report denies you and citizens in your community your legal right to have that information.

How can compliance be achieved? In the context of SARA Title III and the local emergency planning committees, encouraging compliance can include many types of activities from outreach to enforcement. LEPCs can work with local organizations such as Chambers of Commerce to get the message out to small businesses, as well as large companies, to encourage their compliance.

Site visits and community meetings may be helpful. LEPCs, SERCs, State and local governments, and citizen groups can use informal mechanisms such as warning letters and are given authority to file civil enforcement actions in the U.S. District Courts.

The Act provides, and State and local laws may further provide, other mechanisms to be used by State and local committees to compel facility compliance with the law. Knowledge of your authorities under the law will help you in your efforts to gain the cooperation you need.

Where To Start – Education And Outreach

The process of improving facility compliance may involve four steps: outreach to inform facilities of requirements; identification of facilities required to report; communication, education and persuasion; and enforcement actions where necessary.

Everyone prefers that facilities comply voluntarily. Voluntary compliance depends, in part, on efforts made to educate local facility owners about the Act, its reporting requirements, and how the information collected can benefit the community. Enlisting the local news media, cable television stations, fire departments, the Chamber of Commerce, local Rotary clubs and any other business organizations is a starting point.

Speaking to meetings of these groups and using their newsletters can help get the message out effectively and inexpensively. Some LEPCs have conducted extensive letter-writing campaigns.

Others have visited facilities and spoken directly to the owners about their reporting obligations. Once owners learn of their reporting obligations, most will provide the necessary information quickly and accurately.

What Next -- Identifying And Persuading Non-compliers

To reach facilities that are not complying, you can use general outreach or target your efforts to facilities that may be covered. Unfortunately, no comprehensive set of data exists that will identify every facility that is required to comply.

However, sources of information such as water permits, air permits, SARA Title III §313 toxic release inventory reports, and other data housed by your State or local authorities (e.g., hazardous materials permits) may help to identify facilities potentially required to report. Working in coordination with local fire departments will also help identify facilities that store large quantities of chemicals.

In addition, EPA has developed a cross-listing of Standard Industrial Classification (SIC) Codes and the SARA Title III §302 extremely hazardous substances (EHS). This list, together with county or city specific information on businesses, should aid in identifying facilities that may be required to report under the planning provisions. Contact your SERC for copies of the SIC code/EHS cross-listing.

When you identify a facility that is out of compliance, what are your options? Direct contact with the facility owner or operator may be the easiest and most effective way to persuade the facility to comply. If the facility comes into compliance and the LEPC has received all the information it needs, no further action may be necessary.

However, if the LEPC is unsatisfied with the results of its efforts or the facility refuses to comply, the LEPC may want to take further action.

What tools does the law provide to help the LEPC obtain information from a facility? Two provisions in SARA Title III authorize the LEPC to obtain information from facilities. If the LEPC needs additional information from a facility to assist the LEPC in its planning, the authority of SARA Title III §303(d)(3) can be used.

Section 303(d)(3) requires facilities to promptly provide information the LEPC deems necessary for developing and implementing its emergency response plan. This authority is broad in the sense that it may be used to obtain a variety of information related to the identity and location of extremely hazardous substances, existence of facility emergency plans, and additional information needed to develop the LEPC plan.

Section 303(d)(3) is an enforceable provision. Failure to comply with the LEPC request could result in a penalty of up to $25,000 per day. An LEPC should document the information request in a letter to the company.

The request letter should: be sent to the owner or operator; cite the authority the LEPC has to request information (§303(d)(3)); be as specific as possible regarding the information requested; allow the facility a reasonable amount of time in which to reply (e.g., 30 days); and inform the facility owner or operator that failure to comply with the request is a violation of the law which could result in a $25,000 per day penalty. LEPCs should consider the use of certified mail (return receipt requested) for these requests.

Many facilities required to report under the planning provisions are also covered by SARA Title III §312. Under §312, covered facilities must report to the SERC, LEPC, and fire department annually (every March 1) their inventories of hazardous chemicals. Section 312 also authorizes the SERC, LEPC, or a fire department to request information from a facility.

Specifically, §312(e) authorizes these groups to request chemical specific forms on hazardous chemicals present at the facility above (§312(e)(3)(B)) or below (§312(e)(3)(C)) the 10,000 pound threshold.

Section 312(e) can be a powerful tool to get information from facilities that have not been cooperating with the LEPC. Like §303(d)(3), this, too, is an enforceable provision. If the owner or operator fails to provide the information, he or she may be liable for a penalty of up to $25,000 per violation per day.

As with other requests made of a facility, the LEPC, SERC or fire department should formally request the information in a letter, cite the proper authorities, give ample time for the facility to reply (e.g., 30 days) and cite the potential penalty for failure to comply. Use of certified mail may again be appropriate.

If a company has filed a report under §312, SARA Title III authorizes local fire departments to inspect the facility to determine the specific location of hazardous chemicals. LEPC members may want to accompany the fire department to promote a better understanding of the SARA Title III reporting requirements and to obtain information for planning purposes.

In planning inspections, try to give the owner or operator advance notice. Should you encounter problems gaining access to the facility, contact your SERC and the Regional EPA office that has jurisdiction in your area.

These "enforcement" tools may never be needed if a facility is cooperating in the planning process. However, they are available to SERCs, LEPCs, and fire departments should a specific facility be unwilling to provide the necessary information.

If a facility fails to respond to your information request, what are the next steps? If your attempts to obtain information are disregarded or the information is not submitted in a timely manner, you have several options. First, you can work with your SERC to try to get the facility to cooperate. Second, you can notify the facility of your intention to:

- File a civil action in the U.S. District Court for violations of SARA Title III; or
- Assist the SERC and EPA in the enforcement of the provision(s) violated.

If an LEPC decides to cooperate with the SERC and EPA in an enforcement action, it is important that its efforts to bring the facility into compliance be documented. Establishing a record of efforts will aid the State and EPA in taking an enforcement action.

LEPCs should maintain records of phone contacts, direct contacts, any letters that were sent to the company, etc. In developing enforcement actions, EPA will need your support in providing any evidence you have that the facility is in violation. The Agency will also request affidavits from you certifying that the required reports were not filed by the appropriate deadline. Contact your SERC and the Regional EPA office for additional information.

EPA is looking forward to cooperating with SERCs and LEPCs in the effort to make the Emergency Planning and Community Right-to-Know Act a success.

EPA wants to establish enforcement ties with every SERC. This network of people will help to set priorities for enforcement actions within the State and provide a mechanism through which LEPCs can elevate and resolve compliance problems. It is only through our combined efforts that facilities will come to know and comply with this important law.

Enforcement Authorities

SARA Title III contains provisions to ensure that citizens' rights to information are backed by the legal tools needed to obtain cooperation of facility owners and operators. Congress included stiff penalties for failure of owners and operators to comply with the law's reporting requirements.

SARA Title III contains two sections dealing with enforcement: §325 Federal Enforcement and §326 Civil Actions. Actions initiated by LEPCs would likely fall under the civil category, but as described above, LEPCs could cooperate with the State and EPA.

Civil Actions (§326)

SARA Title III provides States, local groups, and citizens the authority to file civil actions in the U.S. District Court against owners and operators if they fail to comply with the law.

The Act gives the public the right to access information and the legal remedies to make information available if an owner or operator is unwilling to cooperate in the emergency planning process or submit the required reports. These provisions emphasize that everyone has a role in ensuring that facilities comply with the Act.

Citizen Suits. Under SARA Title III §326(a)(l), any person has the authority to file a civil action in the U.S. District Court against owners or operators of facilities for their failure to submit: §304(c) follow-up reports; §311 MSDSs or lists of MSDSs; §312 Tier I forms; and §313 Toxic Chemical Release forms.

For any civil action described above, the plaintiff must notify the EPA, the State in which the alleged violation occurs, and the alleged violator 60 days prior to initiating a suit. On January 26, 1989 EPA issued a Proposed Rule on Prior Notice for Citizen Suits under CERCLA and SARA Title III (See the Federal Register Vol. 54 Page 3913). Consult this rule if you plan to bring a civil suit.

State and Local Suits. Section 326(a)(2) authorizes State and local suits. State and local governments have the authority to bring civil actions in the U.S. District Court for: failure to notify under §302; failure to provide information under §303; failure to submit MSDSs or a list of MSDSs as required under §311; and failure to submit Tier I information required under §312. These actions do not require notification prior to commencement.

SARA Title III §329(7) defines "person" as any individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, or interstate body [emphasis added].

Because §326 authorizes any "person" to bring a civil action ·against owners and operators for their failure to submit reports specified under §326(a)(l), this definition suggests that State and local governments, SERCs, and LEPCs could take action under the citizen suit provisions in addition to the suits authorized under §326(a)(2).

FEDERAL ENFORCEMENT (§325)

Under SARA Title III §325, the Federal government has the authority to bring administrative, and civil or criminal judicial actions against violators. EPA's ability to handle SARA Title III cases administratively means that the delays and expenses associated with judicial cases can be avoided. The enforcement authorities available to EPA and the maximum penalties vary by each reporting requirement.

Section 325(a) authorizes the EPA Administrator to order owners or operators of facilities to comply with §§302 and

303. The local U.S. District Court has jurisdiction to enforce the order and assess a civil penalty of up to $25,000 per violation for each day the violation continues. EPA cannot assess these penalties administratively.

Violation of the §304 emergency notification requirements can be addressed through administrative or judicial enforcement. SARA Title III also establishes criminal penalties for knowingly and willfully failing to provide notice or providing false or misleading information.

Section 304 violations can carry a Class I civil penalty of not more than $25,000 per violation or a Class II civil penalty of not more than $25,000 per violation per day.

In the case of subsequent violations, Class II penalties of up to $75,000 for each day a violation continues may be assessed. Any person who knowingly and willfully fails to provide notice in accordance with SARA Title III §304 could receive a fine of up to $25,000 or be imprisoned for not more than two years, or both.

For second or subsequent convictions, the violator will be subject to a fine of not more than $50,000 or imprisoned for not more than five years, or both.

For violations of SARA Title III §§311, 312, and 313, EPA can assess civil penalties by issuing administrative orders or by filing actions in the U.S. District Court to enforce compliance and assess penalties. Violation of §311 subjects the violator to a civil penalty of up to $10,000 for each violation.

Sections 312 and 313 violations subject the violator to civil penalties of not more than $25,000 for each violation. The statute establishes that every day a violation continues is considered a separate violation.

Under §325(d), EPA may assess a penalty of $25,000 for each trade secret claim that is found to be frivolous. The statute also provides criminal penalties for disclosure of trade secret information.

Any person who knowingly and willfully divulges trade secret information will be subject, upon conviction, to a fine of not more than $20,000 or to imprisonment for not more than one year, or both.

SARA Title III provides a special enforcement authority for health professionals: Whenever an owner or operator of a facility fails to provide information to the health professional as required under §323 of the Act, the health professional may bring action in the U.S. District Court to require the owner or operator to comply.

The U.S. District Court has the jurisdiction to issue orders and take other actions as may be necessary to enforce §323.

It's In The Federal Register

You can find detailed information on the various provisions of the Emergency Planning and Community Right-to-know Act in the Federal Register, which is available at public or university libraries. Here are the citations for the EPA regulations covering various sections of the Act.

- Sections 301-303 (emergency planning): April 22, 1987; December 17, 1987; February 25, 1988 (40 CFR 300 and 355)
- Section 304 (emergency release notification): April 22, 1987; December 17, 1987; February 25, 1988 (40 CFR 300 and 355)
- Sections 311-312 (hazardous chemical reporting): October 15, 1987; August 4, 1988 (40 CFR 370)
- Section 313 (toxic chemical release reporting): February 16, 1988; June 20, 1988 (40 CFR 372)
- Section 322 (trade secrets): July 29, 1988 (40 CFR 350)
- Section 325 (Federal Enforcement): May 16, 1989 (40CFR 22)
- Section 326 (Citizen Suits): January 26, 1989 (40 CFR 373 and 374)

Conclusion

The Emergency Planning and Community Right-to-know Act is unique among Federal environmental statutes in providing numerous opportunities for active participation at the local level.

It is designed to enhance local emergency preparedness and awareness of chemical hazards at the community level. The benefits of a successful program can be many, ranging from reducing the potential for injuries and deaths relating to chemical accidents to designing effective city planning standards for air, water and waste management.

The LEPC is the focus of this effort for a community to better understand and prevent chemical accidents. Understanding the authorities that SARA Title III provides will make you better able to carry out an effective chemical awareness and emergency planning program.

Your efforts to implement the program need not be hindered by facilities that are unwilling to cooperate. SARA Title III provides the information gathering and enforcement tools you need to ensure that you can obtain the information that you and your community have a right to know.

Who can I contact for more information or enforcement assistance? For more information or assistance with a specific enforcement-related problem, contact the State Emergency Response Commission of your State and/or your U.S. EPA regional office. There are ten EPA regional offices that serve the States and U.S. territories.

Title Ill: EPCRA Enforcement Authorities

Requirement	Federal	State and Local	Citizen
§302(c) o/o with EHS>TPQ notify SERC by 5/17/87 (or 6 months after EHS>TPQ becomes present) that facility is subject to Act.	§325(a) EPA may order o/o to comply. USDC has authority to enforce and assess a penalty of up to $25k per day.	§326(a}(2)(A)(i) State & Local Governments can file civil action in USDC for failure of o/o to notify SERC.	No authority under §326(a}(1).
§303(d) o/o must appoint facility representative to participate in planning by9/17/87 & provide info for planning when requested.	§325(a) EPA may order o/o to comply. USDC has authority to enforce and assess a penalty of up to $25k per day.	§326(a)(2)(B) SERC or LEPC can file civil action in USDC against o/o for failure to provide information.	No authority under §326{a)(1).
§304(b) o/o must notify SERC & LEPC immediately after release of EHS or CERCLA HS RQ. §304(c) o/o must provide follow-up report as soon as practicable.	§325(b)(l) & (b)(2) Class I& Class II penalties of up to $25k/day (up to$75k/day for second or after) by Administrative Order or in USDC. Criminal penalty: up to $25k per day and/or 2 years.	No authority under§326(a)(2). See §326(a)(1).	§326(a)(I)(A)(i) any person can file civil action in USDC against o/o for failure to submit follow-up report.
§311 o/o who must prepare MSDS for OSHA must submit MSDS/list to SERC, LEPC & fire department by 10/17/87 or3 months after newly subject to OSHA.	§325(C)(2),(4) EPA can assess penalty of up to$10k per violation per day by Administrative Order or in USDC.	§326(a)(2)(A)(ii) & (iii) State & Local Governments can file Civil action in USDC against o/o for failure to submit MSDS or list or make available information requested under §311(c).	§326(a)(l)(A)(ii) any person can file civil action in USDC against o/o for failure to submit MSDS or list.
§312(a) o/o who must prepare MSDS under OSHA must also submit Tier 1 form on 3/1/88, then annually. For newly covered facilities, first forms due 3/1/90.	§325(c)(1),(4) EPA can assess penalty of up to$25k per violation per day by Administrative Order or in USDC.	§326(a)(2)(A)(iv) State & Local Governments can file civil action in USDC against o/o for failure to submit Tier I form. §326(a)(2)(B) SERC & LEPC can file action for failure to submit Tier II form under §312(e)(l).	§326(a)(l)(A)(iii)any person can file civil action in USDC against o/o for failure to submit Tier I information.
§313 o/o of facility that manufactured, processed or used a toxic chemical in previous year must submit TRI form annually starting 7/1/88.	§325(c)(l),(4) EPA can assess penalty of up to$25k per violation per day by Administrative Order or in USDC.	No authority under§326(a)(2). See §326(a)(1).	§326(a)(l)(A)(iv) anyone can file a civil action in USDC against an o/o for failure to submit a TCR form under §313.
§322(a)(2) o/o must submit information to support a trade secret claim.	§325(c)(2) EPA can assess a penalty of up to $10k per violation per day by Administrative Order or in USDC.	No authority.	No Authority.
§325(d) claim must not be frivolous.	§325(d)(l) EPA can assess penalty of $25k per claim for claim that is unsubstantiated or not a trade secret and frivolous by Administrative Order or in USDC.	No Authority	No Authority
§323(b) o/o must submit a MSDS, inventory form, and a TCR form to physician who requests information in an in emergency situation.	§325(c)(2) EPA can assess a penalty of up to $10k per violation by Administrative Order or in USDC.	No Authority	§325(e) Health professional can file action in USDC to compel o/o to comply. USDC may issue order and enforce.

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HOME

IT'S NOT OVER IN OCTOBER

The purpose of this booklet is to offer suggestions to Local Emergency Planning Committees (LEPCs) to help them implement Title III; it is not a comprehensive guide to running an LEPC. This booklet draws on the experience of those LEPCs that have developed comprehensive plans as well as on the experience of the U.S. Environmental Protection Agency (EPA), the Federal Emergency Management Agency (FEMA), the states, the Chemical Manufacturers Association (CMA), other industry and trade associations, and public interest groups. It is intended to help LEPCs establish and maintain their momentum in meeting the Title III mandate and to address some possible implementation problems.

About This Booklet

About Title Ill

In 1986 Congress passed the Emergency Planning and Community Right to Know Act as Title III of the Superfund Amendments and Reauthorization Act (SARA).

Congress enacted this law to help local communities protect public health and safety and the environment from chemical hazards.

To implement Title III, Congress required each state to appoint a State Emergency Response Commission (SERC}.

The SERCs, in turn, were required to divide their states into emergency planning districts and name a Local Emergency Planning Committee (LEPC) for each district.

The expertise (e.g., fire fighting, health, local officials, community groups, media. facility representatives, emergency management) of the required LEPC members ensures that all the necessary elements of the planning process are represented.

The LEPC is the focal point for Title III activities in the community.

The performance of the LEPC is critical to ensuring that the public benefits from the opportunities and information provided for under the law.

The responsibilities of the LEPCs are stated in the law: each LEPC must develop an emergency plan, collect and store information provided by facilities, and make that information available to the public.

Other LEPC activities can be anticipated and are important to carrying out the spirit of the law.

For example, LEPCs will provide a continuing forum in which the local community and facilities can discuss issues related to hazardous substances.

Two of the main goals of Title III are to:

- Provide a basis for each community to develop a chemical emergency preparedness and planning program that suits its individual needs, and
- Provide the public with the identity, quantity, location, and properties of hazardous substances in the community as well as data on annual releases of certain chemicals into the environment.

Getting Off to the Right Start: Outreach Makes It Work

Title III introduced a new relationship among governments at all levels, the private sector, public organizations, and the general public.

Each group has a different, but equally important role in making emergency planning and community right-to-know work.

The goal is national chemical safety and the value to a community can be very real.

The need for outreach -- establishing and maintaining two-way communication -- is a responsibility everyone shares.

The need for outreach in this program is unprecedented because the audience is so diverse. For example, states and localities need support to implement the law; industry needs to understand how and when to comply; the public needs to be aware of the kinds of information available and what it might mean to them. Everyone has a role and the LEPC is critical to the success of the program.

Title III sets October 17, 1988, as the deadline for each LEPC to complete a comprehensive emergency plan. However, October 17 is not the end of the planning process: it is the first step. Each plan must be revised and updated annually. The SERCs must review and make recommendations for any revisions. Other LEPC activities such as managing the information collection from facilities and making it available to the public, coordinating response activities with other planning districts, conducting exercises based on the plan, training, and maintaining the dialogue with the community and industry to improve the safety of facilities and preparedness for accidents are ongoing. In short, as far as LEPCs and the law are concerned, it's not over in October.

A Role for Everyone

- The federal role is to provide national leadership, guidance, technical assistance, access to data about chemical releases, and training through the states.
- The states, through the SERCs, provide leadership to ensure that an emergency planning and implementation structure is developed and to provide training and technical assistance to communities.
- The local role is to work with LEPCs in actually carrying out emergency planning, community right-to-know, and response functions.
- Industry complies with Title III reporting requirements and participates actively with LEPCs and SERCs to ensure that Title III works.
- The public can get involved by increasing their awareness and understanding of chemical risks and supporting actions to increase public safety and protection of the environment.

The LEPC Is the Key

Although EPA, FEMA, other federal agencies, state governments, and industry are cooperating with local communities to make Title III work, the ultimate responsibility for the success of the program rests with you at the local level. Because you are most familiar with your community, you are in the best position to develop plans to prevent emergency situations to ensure appropriate responses if they occur, and to become the forum in your community for discussions and decisions on hazardous substances. The SERCs appoint LEPCs and have the responsibility for coordinating and supervising LEPC activities, but it is up to you at the local level to make the LEPC work. The mission of your LEPC is:

- To develop a comprehensive emergency plan for your community by October 17, 1988, and keep the plan up-to-date. To be effective, planning must be an ongoing activity.
- To receive information about accidental chemical releases.
- To collect, manage, and provide public access to information on hazardous chemicals in your area.
- To educate the public about risks from accidental and routine releases .of chemicals and work with facilities to minimize the risks.

The first three responsibilities .are mandated by Title III; the last is not included in the letter of the law, but rather in its spirit. The right-to-know provisions of the law will be of limited value to the community unless the public is given the means to understand the information and its implications.

The ability of your LEPC to improve the safety of your community will be far greater if you have an informed and active citizenry to support your activities.

"Because you are most familiar with your community, you are in the best position to develop plans to prevent emergency situations." SERCs designated emergency planning districts for which LEPCs have been named. Thirty-five states used existing local government subdivisions (counties, municipalities, or a combination of the two). Ten states and one territory named existing regional response or planning districts. Five states designated the entire state as the planning district. Overall, an estimated 4,000 districts have been designated across the country. Some states have allowed local jurisdictions to consolidate into multi-jurisdictional districts to form their LEPC.

Work with Your SERC

You should look upon your SERC as a resource that can provide support and might save you time and money.

The law requires SERCs to provide coordination and oversight of LEPCs; the SERC should serve as your link to state environmental and health agencies as well as to state law enforcement and emergency management offices.

These agencies may be able to provide technical assistance and guidance. The SERC is also your link to the Regional Response Team (RRT), which is available to review plans from state priority areas and provide information on federal assistance during an emergency.

Your SERC may be able to provide you with some of the following kinds of assistance:

- Planning assistance, plan testing, and training;
- Information on sources of funding;
- A storage/retrieval location for computerized information, as well as other information management assistance:
- Contact with statewide and possibly national industry groups that can help you with information and expertise;
- Workshops that focus on Title III issues;
- Data on chemicals being transported on interstate and state highways that pass through your planning district: and
- Literature that can be used to inform the public about Title III.

Because the SERCs will be reviewing all LEPC plans, they will have information and ideas they can pass on to you.

Working with your SERC at an early stage will be to your benefit.

"The SERC should serve as your link to state agencies." All states as well as the District of Columbia, Puerto Rico, and American territories have established SERCs. Some states, such as Nebraska and Mississippi, have named a single state agency to act as the SERC. Others, such as Montana, have drawn members from a number of state agencies. Many states have included local officials, industry representatives, and the public as well as state officials; for example, the Ohio SERC has 14 representatives of state agencies and 17 members drawn from industry, public interest groups, and local officials.

Knowing the Law

Title III is a complex law that places a number of requirements on you, your SERC, facilities, and EPA. To carry out your role, it is important that you understand the law.

One part of Title III that has confused some LEPCs involves the various information reporting requirements. You will receive different kinds of information from facilities about chemicals on several lists. This information must be made available to the public through the LEPCs and SERCs. Facilities may also give you information that they are required to submit only to the SERCs and EPA. The following is a summary of the Title III reporting requirements.

- ***Emergency Planning (section 303***). Facilities that have one or more of 366 extremely hazardous substances in quantities above limits set by EPA (threshold planning quantities) must notify you that these substances are present. Substances are included on the list of extremely hazardous substances because they are acutely toxic, that is they can cause death or injury with a brief exposure. In addition to facilities that handle these chemicals, Title III requires you to identify any other facility that could pose a risk or be at risk (e.g., hospitals or facilities that handle explosives or flammable substances). A comprehensive plan will include all facilities and transportation routes that you judge to pose a threat even if they do not handle extremely hazardous substances.
- ***Emergency Notification (section 304***). You and the SERC will receive emergency information (e.g., identity of the substance released, the quantity released, health effects) about accidental releases of chemicals on the extremely hazardous substances list, as well as substances covered by Superfund, the hazardous substance cleanup program. As soon as possible after an accident, the facility must submit a written follow-up notice with additional information.

A complete copy of the law is available in the United States Code (42 USC 11001 et seq.) and can be obtained from the federal and state governments, most attorney's offices, many public libraries, and all law libraries. EPA, the states, industry, and public interest groups have published a number of fact sheets and guides to Title III requirements. Videotapes and slide shows are also available.

If you need ideas on how to organize your LEPC, what to include in your plan, and how to arrange your plan, consult the Hazardous Materials Emergency Planning Guide (NRT-1), published by the National Response Team in March 1987. NRT-1 contains a sample plan outline as well as the key elements that should be included in your plan.

- ***Hazardous Chemical Reporting (sections 311-12***). Each LEPC, SERC, and local fire department will receive information on hazardous chemicals for which the Occupational Safety and Health Administration (OSHA) requires industry to have Material Safety Data Sheets (MSDSs). MSDSs include the basic characteristics of the chemical involved; this information can be used for emergency planning, response, and other public purposes. Under section 311 facilities must submit either the MSDS for each chemical or a list of MSDS chemicals. Under section 312 each facility must submit an inventory form that includes general information on the quantity and location of OSHA-regulated hazardous chemicals it handles and stores.
- ***Toxic Release Inventory (section 313***). EPA headquarters and the states will receive information about total annual releases to air, land, and water of over 300 toxic chemicals and 20 chemical categories listed under section 313 of Title III. EPA is required to make this information available to the public through a data base. In general, the chemicals on the section 313 list are those that are toxic, are suspected carcinogens, or are capable of having a significant adverse effect on the environment. Although industry is not required to submit the release information to your LEPC, some companies may provide it to you directly. You should request it from the state or facilities or access the EPA data base. This information will assist you in developing a full picture of chemical hazards for your community and for individual facilities. The public may request it and you can anticipate questions on this information.

In summary, your plan must include facilities that have extremely hazardous substances. You will receive information about other chemicals. Together these four reporting requirements provide a broad picture of hazardous chemicals present in your community. The information you receive will help your planning and make it easier for you to make decisions about the potential hazards posed by these chemicals in your community.

Tennessee is making data submitted under Title III easier for its I.EPCs to use. The Tennessee Emergency Management Agency (TEMA) has developed its own format for the MSDS information submitted under Sections 311 and 312. The reorganized data is divided into 3 general areas:

- Baseline data (facility and contact, local, fire department, TEMA region);
- Compliance data; and
- Chemical lists.

The reorganized data is provided to the LEPCs. TEMA has also developed a tracking system for data submitted under Sections 302, 304, and 313. To help the LEPCs understand the data, how it can be obtained, and how it can be used for planning. TEMA has held workshops for LEPCs.

Get Everyone Involved

Congress required that LEPC meetings and decisions involve public participation and that you provide the public with access to the information you receive. The right-to-know provisions of Title III are meant to give the LEPC and the public information about chemical hazards and to involve the entire community in a process of protecting public safety and health and the environment.

LEPCs are to be broad-based and include at a minimum, representatives of elected officials, law enforcement, emergency management, fire service, emergency medical services, health, local environmental and transportation groups, hospitals, the media, community groups, and owners and operators of the facilities covered under Title III. The average LEPC has about 15 members.

Regardless of the number of members, you must be sure that the LEPC membership represents the entire community, particularly those people who will have to make the plan work in an emergency. Your plan is more likely to be carried out successfully if the people who have to use it have a voice in creating it. In addition, wide-ranging community involvement will increase the credibility of the plan and improve community cooperation in an emergency.

Leadership Is Critical

The LEPC chairperson can be any LEPC member. Some LEPCs have chosen political leaders; others have appointed representatives from public safety departments, emergency management agencies, environmental agencies or groups, industry, or civic organizations. Important factors to consider are the leader's availability, credibility, management and communications skills, commitment to the process, and the degree of respect the person has from other members and the community.

Because LEPC members have diverse backgrounds and perspectives, conflicts could arise. Members should see their role as providing their particular expertise, rather than representing a specific organization. For example, the media representative does not represent a newspaper or broadcast station looking for a story, but rather is there to ensure that communications issues are addressed adequately.

“The LEPC membership represents the entire community."

The Baytown, Texas, LEPC created joint industry/non-industry co-chairs for the LEPC as a whole and for individual subcommittees. The LEPC will include representatives from the following:

• Petrochemical industry	Baytown Health Department	Houston Emergency Management
• Fire Department	Police Department	American Red Cross
• City Safety Coordinator	City Public Works/Engineering	Office of the state senator
• Baytown Emergency Management	Baytown City Manager	Baytown newspaper
• Local radio station	Medical community	School district
• Women's Club	Chamber of Commerce	Baytown Emergency Services
• Environmental groups	Private citizens	

Appoint Subcommittees

Large LEPCs have found that dividing the work among subcommittees can facilitate planning and data management. Subcommittees allow members to specialize and help the process move forward more quickly because you can work on several areas at one time. You might appoint subcommittees for the following tasks:

- Gathering and reviewing existing community and facility plans;
- Making a list of existing response equipment available in the community;
- Identifying financial resources;
- Coordinating with neighboring LEPCs and the SERC;
- Conducting a hazards analysis;
- Managing information (e.g., MSDSs); and
- Replying to citizens' requests for information.

"Subcommittees allow members to specialize and help move the process forward."

The Racine, Wisconsin, LEPC has established 7 standing subcommittees:

- Medical and Community Health
- Public Information and Media Relations
- Facilities
- Border (for cross-county planning)
- Fire Service
- Law Enforcement
- Liaison (with SERC, EPA)

Encourage Compliance

Businesses that manufacture, process, or handle any hazardous or toxic chemicals in quantities above EPA's limits must comply with Title Ill.

However, small companies that use hazardous substances and perhaps even larger businesses that do not usually think of themselves as involved with chemicals· may need your help.

Because some small businesses may not be aware of Title Ill, let alone that they are subject to its provisions, one of your first jobs will be outreach -- getting the message to small businesses, as well as large companies, to encourage their compliance.

Many business owners belong to organizations such as the Chamber of Commerce, Rotary, and local manufacturers associations. Speaking to meetings of these groups and using their newsletters can help get the message out inexpensively.

If you, your SERC, local industries, or trade associations have printed brochures about Title Ill, you may be able to include the brochures in a newsletter mailing.

Some LEPCs have sent notices to industry in utility bills. You may also want to have your SERC contact statewide trade associations and use their newsletters, meetings, and trade shows to reach particular groups of small businesses that might not be aware of Title III.

Local governments may also be covered under Title III. For example, municipal water and sewage treatment plants may use chemicals that are listed as extremely hazardous substances.

Transit authorities may also handle extremely .hazardous substances in sufficient quantity to be covered by Title III. You may be able to use the appropriate representatives on your LEPC to ensure that such local agencies are aware of the requirements.

"Small companies that use hazardous substances may need your help."

Reaching the back shop electroplating plant with its 5,000-gallon dip tank of sulfuric acid was the concern of Bob Straw, chairman of the York County, Pennsylvania, LEPC. Straw included a member of the county manufacturers association on the LEPC to serve as a link to these small businesses. He also appointed the county agricultural agent to help the committee contact farmers. Through these people, Straw was able to put notices about Title III requirements in newsletters from the manufacturers' association and the local Chamber of Commerce.

Draw on Existing Plans

Existing plans developed specifically for your area may include information about issues, such as transportation routes that you will need to consider.

You can reduce your planning load by “piggybacking” on these plans; that is, you can use the information and ideas in existing plans as a basis for developing elements of your plan.

Before using information from other plans, however, be sure it is up-to-date and relevant to your plan.

- If your area has an “all-hazard emergency operations plan" funded by FEMA, or other state or local plans, you may be able to integrate your Title III plan into the overall plan as an appendix (see NRT-1).
- If your area is near a nuclear power plant, check existing plans for traffic control, evacuation, or sheltering provisions; many such provisions may be applicable to planning for chemical emergencies.
- If hospitals in the area already have mass casualty plans, you can probably incorporate portions of these.
- If your fire departments have mutual aid agreements with other jurisdictions, you will probably want to integrate these into your Title III plan.
- If local facilities have plans developed under the Chemical Manufacturers Association's Community Awareness and Emergency Response program (CAER), you may be able to incorporate these.

Developing an emergency plan is time-consuming. Some possible short-cuts, such as using a "model plan," are not only contrary to the intent of Title III planning but more importantly will reduce effective local preparedness in the long run.

"Model plans" have generalized language appropriate for any planning district, with blank spaces in which a LEPC can insert specific local information.

Using a model plan does not encourage the active participation of all LEPC members in the planning process and does not recognize unique local issues.

Title III (section 303) requires that a plan include at least the following:

1. Facilities that have extremely hazardous substances (EHSs), routes used to transport EHSs, and other facilities contributing to or subject to risks;
2. Methods and procedures to be followed by facilities and responders during an incident;
3. Designation of community and facility emergency coordinators;
4. Procedures for effectively notifying the community of a release;
5. Methods for determining the occurrence of a release and identifying areas likely to be affected;
6. Emergency equipment and facilities in the community and at covered facilities;
7. Evacuation plans;
8. Training programs: and
9. Methods and schedules for testing the emergency plan.

In addition, plans should clearly identify a chain of command during response actions and provide for effective communications among those who respond. See NRT-1 for a detailed discussion of elements to be included in an emergency plan.

Set Priorities

Title III sets October 17, 1988, as the deadline for each LEPC to complete a plan. While you must have a first plan by this date, you may not have a comprehensive plan completed by the deadline. As you work toward the October 17 deadline, you will need to set priorities.

To determine which facilities you should plan for first, do a hazards analysis in order to identify those that pose the greatest risk. These can be facilities that handle large quantities of extremely hazardous substances, facilities that have had serious releases in the past, or facilities that are close to highly populated areas. Then focus your planning efforts on the high priority hazards.

Technical Guidance for Hazards Analysis – Emergency Planning for Extremely Hazardous Substances (prepared by EPA, FEMA, and the U.S. Department of Transportation (DOT)) provides technical assistance to LEPCs to assess the hazards related to potential airborne releases.

You can follow the guidance to decide which hazards pose the greatest risk and develop plans for high priority hazards before the October deadline. You should then expand the plan, where needed, to cover the lower priority hazards in your area. The exercises or simulations you run to test your community's ability to respond to an emergency and your annual plan reviews will provide the basis for revising the plan and for developing standard operating procedures for responders.

"Develop plans for high priority hazards before the October deadline."

A hazards analysis is essential to developing a plan. As used in NRT-1 and in the Technical Guidance the term "hazards analysis" includes three steps:

- Hazards Identification: determining the identity, location, and quantity of hazardous chemicals, and the hazards they pose.
- Vulnerability Analysis: determining the areas, populations, and facilities that may be vulnerable to harm if a release occurs.
- Risk Analysis: determining the likelihood of a release and the severity of the consequences.

A community hazards analysis should not be confused with facility risk assessments or hazard evaluations, both of which involve formal techniques requiring technical experts.

Make the Best Use of Available Resources

Because LEPC members are likely to have full-time jobs you will need to be creative in your use of community 'resources to help carry out the LEPC's functions. Many LEPC members will be able to call upon their organizations' staff for some support functions. Community groups, volunteer organizations, environmental and public interest groups, and industry may be able to provide administrative and secretarial support. Technical support may be available from science and engineering faculties at local colleges or high schools, from industry, or from retired scientists and engineers.

Some of your best sources of help for planning and outreach are the organizations in your community that deal with emergencies. For example, fire departments can help analyze hazards and assess potential risks; police departments may have information about possible evacuation routes; the local emergency management agency can provide information on existing emergency procedures.

LEPC members represent a wide range of community agencies and organizations. Maximize your capabilities by using the LEPC members as contact points to identify people within the community who can provide you with specific help.

"Some of your best sources of help are the organizations in your community that deal with emergencies."

In Pampa, Texas, the fire department is expanding an existing program in which every business in the city is inspected annually for fire hazards. During the inspections, a hazardous materials response team member surveys the facility to determine reportable chemicals, informs the owner or operator about Title III, and assists with reporting procedures. This not only helps planning, but also enhances the department's relations with the public.

The Butler, Kansas, LEPC found help in an unlikely place: the state prison honor camp. A well-educated inmate was working as a file clerk in the Health Department. The LEPC got him interested in Title III and he directed the county's hazardous materials survey.

Talk with Neighboring Communities

Consult with your neighboring LEPCs, especially if you have common risks and concerns. In an emergency, you may have to call on them for help or they may call you. In many cases, plans must include several communities to be effective. Consider the need to:

- Identify whom to call in other planning districts if you need help in an emergency;
- Ask them how they are funding their activities;
- Identify available response equipment and personnel;
- Negotiate procedures for mutual assistance for emergencies that cross boundary lines;
- Coordinate your hazards analyses;
- Coordinate your review of transportation routes; and
- Investigate sharing computers or other resources.

Each LEPC should consider its neighboring LEPCs as partners and resources. They share your problems; working with them may help you find common solutions.

"Consider your neighboring LEPCs as partners and resources."

When the hazards analysis subcommittee of the Prince William County, Virginia, LEPC needed information on transportation routes, one subcommittee member suggested that neighboring LEPCs might have information because the types and quantities of hazardous materials transported on the interstate highway through Prince William County would be roughly the same on other segments of the highway. After he began asking other planners in the area for information on the availability of transportation data bases for the highway, it was discovered that the State of Virginia had such a database.

Industry's Role

Title III requires each facility owner or operator with extremely hazardous substances to promptly provide you with any information you need to develop and implement the emergency plan. Title III also requires these facilities to designate a facility emergency coordinator. Experience has shown that many facility emergency coordinators will be eager to cooperate with you.
They can provide:

- Technical experts;
- Community awareness programs;
- Training and safe handling instructions;
- Access to non-emergency chemical information through the Chemical Referral Center
- Computer assistance; and
- Information about transportation routes.

Facility hazard information, safety audits, and emergency plans are a good starting point for information-gathering and planning.

The Chemical Manufacturers' Association (CMA), a trade association for chemical companies, developed the Community Awareness and Emergency Response (CAER) program to encourage chemical plant managers to take the initiative in opening a dialogue and cooperating with local communities to develop integrated hazardous materials response plans. Even if you have no CAER facilities in your district, CAER resources (e.g., "CAER Program Handbook") can be useful to LEPCs.

The Chemical Transportation Emergency Center (CHEMTREC), operated by CIMA, provides information and assistance to first responders at the scene of a chemical release. CHEMTREC contacts the shipper or producer of the material for more detailed information, including on-scene assistance when feasible. CHEMTREC provides a digital transmission of the chemical report, which includes data on the hazards, protective actions needed, mitigation techniques, and first-aid. For emergencies involving chlorine, a call to CHEMTREC will activate the mutual aid program operated by the Chlorine Institute, the Chlorine Emergency Plan.

The initial process of data collection creates a dialogue between the LEPC and chemical facilities that may lead to prompt safety results. The Washington, DC, LEPC has met with an official of each industry that uses extremely hazardous substances within the city. Discussions led to immediate commitment by one industry to reduce the amount of ammonia on site. The city's sewage treatment plant will reduce its storage of chlorine by 60 percent.

Managing Information

Title III requires local facilities to give you information on a variety of substances. You are probably already facing the problem of how to cope with all this material. As you develop strategies to deal with the material, keep in mind that:

- You must have procedures for making the material available to the public;
- You are required to designate an information coordinator; and
- You must be able to access the information quickly in an emergency.

LEPCs are using a number of approaches to organize the Title III materials. Some LEPCs are able to manage the data manually using the LEPC members or staff. Other LEPCs manage the data using their own computers or those of other agencies with systems and information management techniques already in place.

If your LEPC wants to use a computer to handle the information but does not have the funds to buy one, you may be able to enlist the help of your local fire departments, local governments, state agencies, or local businesses. They may have computers, software, and staff who can help organize the data. In the case of fire departments. or other government agencies, they may already have data bases that can be expanded to include your information.

One method of controlling the amount of data you have to handle is to encourage facilities fulfilling MSDS requirements to supply a list of the chemicals for which MSDSs are required, rather than to supply the MSDSs themselves. You can then request MSDSs on those chemicals that are of particular concern. If you need more information on certain chemicals, you can draw on a number of data bases maintained by federal agencies and on CMA's Chemical Referral Center {1-800-262-8200), which provides access to chemical information in non-emergency situations.

For some LEPCs, developing a system for accessing information during an emergency will be challenging. Areas having one or two facilities may be able to store files on emergency response vehicles for now. However, communities receiving large volumes of information will need other approaches. A number of communities are exploring computer systems or asking facilities to set up lock boxes on site that contain the information about the facility.

Kansas is planning to set up an integrated computerized data base to handle all Title III information submitted in the state. EPCs will be able to use the system to gain access to chemical data and to feed it to responders. The state also hopes to make the information available on computer disks for libraries so the public will be able to check on local facilities if they wish.

Responding to Public Requests

Title III gives the public the right to obtain copies of information the facilities submit to you. You should keep this in mind when you develop methods of organizing information. For instance, you may want to file the data by facility for emergency purposes, but the public may be more interested in obtaining information· on all the facilities in the area using a particular chemical.

Reserve some of your LEPC resources for responding to, public requests for information.

Simply providing the information may not be enough; you may also have to help the public understand the risks posed by certain substances and certain situations. Although it has often been left to technical experts, educating the public about risks and involving them in decisions about what is an "acceptable" level of risk are important challenges for LEPCs. The LEPC, as the focal point for public discussion, can help reach a common understanding of the risks in the community, and can help communicate this information to the general public.

Sometimes, anger about what the public perceives as risky situations arises not so much from the actual risk, as from people's feeling that they have no control over what is happening to them.

You can mitigate this by including the public in the decision-making process from the beginning

"Educating the public about risks and involving them in decisions are important challenges for LEPCs."

The SERC and local industries may be able to help you with risk communication. EPA has published a short pamphlet, Explaining Environmental Risk, which can help you deal with both the public and the press, and Technical Assistance Bulletin #4, which summarizes the results of a conference on risk communications. CMA and the New Jersey Department of Environmental Protection have also published material on this subject.

Liability

Check with your SERC about your state law and ask about liability considerations and protection.

Some LEPCs and individual LEPC members have expressed concern that they might be held legally liable if they approve an emergency response plan that proves to be inadequate during an accident. SERCs are generally considered state agencies and are, therefore, covered by the state's immunity provisions.

Some states have extended this immunity to LEPCs through laws or through legal decisions. Others have provided liability coverage for LEPCs.

Funding Your Activities

When Title III was passed, Congress did not provide funding for most of the required activities. Some states and communities have appropriated general revenue funds for LEPC activities: others are relying on implementation fees and existing state agency budgets. Because states have limited resources, each LEPC must find the means for achieving its goals. Some LEPCs will do their work with little additional money. Your LEPC members may already be donating their time.

LEPCs and Computers

You may have decided that the right computer could help you with your LEPC tasks. Available software can provide you with a way to store information submitted by facilities, conduct hazards analyses, map hazards in your community as part of your planning process, and store information on the properties and health risks posed by chemicals in your area. Appendix K of the Technical Guidance for Hazards Analysis includes information on computer applications for emergency response planning.

Virginia has obtained a commitment from the State Division of Risk Management to provide insurance coverage for LEPC members for any claims made against them as LEPC members.

Some LEPCs are tapping local businesses and agencies for cost-saving services and donations. Local colleges and universities may be a source of volunteer data collectors, planners, and programmers.

EPA has made chemical data bases available to states, the public, and private sector computer firms. EPA has also collaborated with the National Oceanic and Atmospheric Administration (NOAA) to develop the Computer-Aided Management of Emergency Operations (CAMEO) program to help emergency planners.

Training

Title III mandated federal emergency training courses to emphasize hazardous chemicals. Congress authorized $5 million a year for 1987 through 1990 for Title III training funds to help state and local governments improve emergency planning, preparedness, mitigation, and response. Over the past two years, several hundred planners from around the country have attended weeklong emergency planning training sessions at FEMA's Emergency Management Institute in Emmitsburg, Maryland. These courses, sponsored by FEMA, EPA, and DOT, are designed to train planners so they will be able to return to states and communities to instruct others. Consult your EPA and FEMA Regional Office for federally sponsored training courses.

One way to maximize the impact of training programs and other information programs is to coordinate them with other LEPCs and with industry. For example, if your LEPC arranges a meeting with experts on transportation planning or hazards analysis, invite your neighboring LEPCs to join you. If you hear that another LEPC is setting up a seminar that interests you, ask to participate. By doing this, you will create a network of contacts and mutual aid that will benefit everyone.

Enforcement

Section 325 of Title III addresses the penalties for failure to comply with the requirements of this law. Civil and administrative penalties ranging from up to $10,000-$75,000 per violation or per day per violation can be assessed to facilities that fail to meet the emergency planning, emergency notification, community right-to-know, toxic chemical release, and trade secret reporting requirements.

Also, criminal penalties of up to $50,000 or five years in prison may be given to any person who knowingly and willfully fails to provide emergency release notification. Penalties of not more than $20,000 and/or up to one year in prison may be given to any person who knowingly and willfully discloses any information entitled to protection as a trade secret. In addition, section 326 allows citizens to initiate civil actions against EPA, SERCs, and the owner or operator of a facility for failure to meet certain requirements of Title III. LEPCs have the authority to initiate actions under the provisions for state and local suits or under the citizen suit provisions of section 326.

''Maximize the impact of training programs and other information programs."

In FY 1987 Kansas received $51,000 and California $334,000 under Title III. All states received some of the federal training grant funds. Kansas added $10,000 in state funds to begin separate training seminars for LEPC members and first responders. These funds are being administered by FEMA. Check with your SERC and learn how to apply for federal funds and to see what state training programs may be available to you.

"LEPCs have the authority to initiate legal actions."

CHECKLIST*

- ✓ Make sure your LEPC membership is broad-based and representative of your community.
- ✓ Develop a plan for financing your LEPC.
- ✓ Organize your LEPC to use available resources such as trade and volunteer organizations.
- ✓ Develop a public education and information program to:
    - o Involve the public in the planning process;
    - o Respond to requests for information; and
    - o Help the public understand the risks.
- ✓ Take steps to reach small businesses in your community.
- ✓ Organize your LEPC into functional subcommittees to make the tasks more manageable.
- ✓ Include all appropriate agencies, departments, or organizations in the process of developing or reviewing the emergency plan.
- ✓ Complete a hazards analysis that:
    - o Identifies the types and locations of hazards;
    - o Identifies the vulnerable zones and human populations at risk; and
    - o Assesses the likelihood of an accident and the severity of consequences to humans.
- ✓ Identify available emergency equipment, personnel, and facilities:
    - o In the community;
    - o At facilities; and
    - o In the region.
- ✓ Identify (by title or position) the one individual responsible for each participating organization during a response, as well as the one individual responsible for each major response, function and service.
- ✓ Develop a program to:
    - o Train emergency personnel to carry out your plan; and
    - o Test the plan and revise it.
- ✓ Obtain the Toxic Release submissions for your area in order to develop a full picture of chemical hazards for your community and for individual facilities.
- ✓ Review all chemical information you receive for your area and work to reduce risks.

·For an extended list of criteria, see NRT-1. '

EPA 550-B99-003, June, 1999

RMPs ARE ON THE WAY! HOW LEPCS AND OTHER LOCAL AGENCIES CAN INCLUDE INFORMATION FROM RMPs IN THEIR ONGOING WORK

HOME

ABOUT THIS BOOKLET...

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) calls for the establishment of local emergency planning committees (LEPCs). LEPCs are to have broad-based membership whose primary work is to receive information from local facilities about chemicals in the community, use that information to develop a comprehensive emergency plan for the community, and respond to public inquiries about local chemical hazards and releases. There are now more than 3,500 LEPCs, and they reflect the diversity of our country. Most LEPCs are organized to serve a county; some are for a single large city; others cover the better part of an entire state.

We are publishing this booklet in anticipation of the impact a new regulation will have on LEPCs. The regulation implementing section 112(r) of the Clean Air Act requires facilities to develop a risk management program to prevent and mitigate the effects of chemical accidents, and to document the program in a Risk Management Plan (RMP). These RMPs will be available to state and local agencies and to the public. Therefore, LEPCs will have access to more detailed information about chemical hazards in their communities. LEPCs can use this information to improve emergency response plans, inform the public about chemical accident hazards and risks, and work with industry and the public to reduce risks and improve chemical safety.

This booklet will not teach you everything about the RMP regulation. Rather, the purpose of this booklet is to describe how LEPCs and similar local agencies can take advantage of the risk management program to build on their existing planning and right-to-know activities under EPCRA. We intend this booklet to follow the style of and replace It's Not Over in October, a document that EPA and other groups published in 1988 to encourage new LEPCs not to stop working once they had completed their emergency plans by the October 1988 deadline. For more detailed information about the RMP regulation, consult EPA's General Guidance for Risk Management Programs (http://www.epa.gov/ceppo).

The RMP regulation contains a deadline for industry: June 21, 1999. By that date, covered facilities were required to have in place a risk management program and must have submitted an RMP to EPA. This deadline for industry is an opportunity for LEPCs. June 1999 can be a beginning, a time to update existing emergency plans with the new RMP information, a time to better understand chemical hazards in your community and share your understanding with the public, a time to declare in word and deed that you will promote chemical safety in your community by focusing on preventing accidents.

RMPs are on the way! We hope that this booklet helps you and your LEPC in your important work of protecting human life and the environment where you live.

NEW INFORMATION IS BECOMING AVAILABLE ABOUT CHEMICALS IN YOUR COMMUNITY

In 1990, section 112(r) was added to the Clean Air Act (CAA). Section 112(r) calls on EPA to establish requirements for facilities to reduce the likelihood and severity of accidental chemical releases, using hazard assessments, prevention programs, and emergency response planning. EPA implemented section 112(r) in its Risk Management Program regulation. Facilities that are covered by the Risk Management Program will summarize their program activities in Risk Management Plans (RMPs). Facilities were required to submit their RMPs to EPA by June 21, 1999, and EPA has made the RMPs available to the public. A host of new information is now available to you!

The provisions for accidental release prevention in CAA section 112(r) and the Risk Management Program regulation build on the planning and preparedness foundation laid by the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA—also known as SARA Title III). EPCRA is intended to encourage emergency planning efforts at state and local levels and to increase public awareness and understanding of potential chemical hazards present in the community. EPCRA sets up a framework for emergency planning at the state and local levels and provides the authority to collect chemical information that is important to communities. The CAA section 112(r) program provides a complementary approach to chemical safety—it requires that facilities take steps to identify and control on-site hazards. It also provides for public access to information about the actions facilities are taking to prevent and mitigate the potential offsite effects of these hazards.

CAA section 112(r) is entitled Prevention of Accidental Releases. This booklet speaks about the Risk Management Program rule (40 CFR part 68) that EPA published to implement section 112(r). The rule established the requirements of the Risk Management Program.

Another term you will want to become familiar with is "Risk Management Plan," which refers to the document a facility must prepare to summarize its risk management program. In this booklet, we use "RMP" to refer to the Risk Management Plan.

Information You Already Have

Under EPCRA, you currently receive information from covered facilities on the chemicals they have, the quantities of chemicals stored, the hazards associated with those chemicals, and information on storage locations and conditions. Specifically, the EPCRA program provides you with the following information:

- Notification from facilities that have extremely hazardous substances (EHSs) in excess of threshold planning quantity amounts. This information is reported directly to the local emergency planning committee (LEPC). (EPCRA sections 302 and 303)
- Notification of emergency information about accidental releases of reportable quantities of EHSs and substances regulated under CERCLA (CERCLA hazardous substances). This information is reported to the LEPC's community emergency coordinator. (EPCRA section 304)
- Material Safety Data Sheets (MSDSs) – or lists of hazardous chemicals – from facilities that have threshold quantities of hazardous chemicals and that must have an MSDS under the Occupational Safety and Health Act, and annual inventory information on the quantity, hazard category, and location and storage conditions of hazardous chemicals at facilities at threshold levels. This information is reported directly to the LEPC. (EPCRA sections 311 and 312)
- Annual reports on total yearly releases of toxic chemicals from regulated facilities. This information is reported to EPA. EPA compiles this information in a database called the Toxics Release Inventory (TRI) and makes the information available to the public. (EPCRA section 313)

New Information

Under the CAA section 112(r) Risk Management Program, additional information is now available to you – in the RMPs that facilities submitted to EPA.

- Facility hazard assessments, including worst-case release and alternative release scenarios;
- Facility accident prevention activities, such as use of special safety equipment, employee safety training programs, and process hazards analyses conducted by the facility;
- Past chemical accidents at a facility; and
- Facility emergency response programs and plans.

Both EPCRA and the CAA section 112(r) Risk Management Program encourage communication between facilities and the surrounding communities about chemical safety and chemical risks. Regulatory requirements, by themselves, will not guarantee safety from chemical accidents. Information about hazards in a community will allow local emergency officials and the public to work with industry to prevent accidents.

For example, facilities are required to provide information about possible worst-case scenarios under the Risk Management Program – and officials and the public can use the information to understand the chemical hazards in the community and then engage in a dialogue with industry to reduce risk. In this way, accident prevention is focused primarily at the local level where the risk is found.

Information Sources and Contacts

Q: Where can I get updates on the latest EPCRA and RMP guidance and program information?

A: EPA's Chemical Emergency Preparedness and Prevention Internet Homepage at http://www.epa.gov/ceppo/

Q: Where can I order copies of documents?

A: National Service Center for Environmental Publications (NSCEP) Toll-Free: (800) 490-9198

Q: Where can I get answers to my questions and order single copies of documents?

A: The RCRA, Superfund and EPCRA Hotline Toll-Free: (800) 424-9346

Tips & Hints

By combining RMP information with EPCRA data, your LEPC can enhance its role as a key player on issues that relate to the use of hazardous chemicals in the community. You can:

1) Use accidental release scenarios to set realistic priorities among your local emergency preparedness activities.
2) Serve as a resource for facilities and the public in promoting risk communication.
3) Use accident histories and summaries of prevention activities to help you talk with facilities about steps to reduce risk.
4) Provide compliance assistance to facilities on emergency response, accidental release scenarios, and other issues.
5) Reach out to other community groups (for example, the local zoning board, environmental groups) who may be interested in elements of the RMP and help them understand the data and how the data could assist them.

A ROLE FOR EVERYONE IN CHEMICAL SAFETY

Industry complies with EPCRA and RMP reporting requirements and participates actively with LEPCs and State Emergency Response Commissions (SERCs) to ensure that the public understands chemical hazards in the community and that community responders are prepared to take appropriate steps if an accident happens. In addition to the reporting requirements, the RMP regulation requires facilities to develop a risk management program to ensure that the facility has implemented accident prevention and emergency response programs that fit the chemical hazards at the facility. In addition to these specific requirements, CAA section 112(r)(1) establishes a general duty for industry to operate safely. EPA's federal role is to provide national leadership, guidance, and technical assistance for implementing both EPCRA and the RMP regulation; provide access to TRI data about chemical releases (under EPCRA section 313); and receive risk management plans from industry and then make them available to state and local agencies and the general public. Additionally, EPA Regional offices will implement all or part of the risk management program in states that have chosen not to seek formal delegation from EPA to implement the RMP program. The states, through the SERCs, provide EPCRA leadership to ensure that an emergency planning and EPCRA implementation structure is developed and to provide training and technical assistance to communities. Under the Clean Air Act, state (as well as local and regional) air permitting agencies issue permits to some facilities that are also covered by the RMP regulation.

In addition, EPA will delegate to interested states and local agencies the authority to implement the RMP program – this is already happening in Georgia, Florida, North Carolina, South Carolina, New Jersey, California, Puerto Rico, and the Virgin Islands. Some SERCs are involved in implementing the RMP program. At the local level, LEPCs carry out the emergency planning and community right-to-know requirements of EPCRA. First responders (who are typically represented on LEPCs) implement contingency plans when response to a chemical accident is necessary. LEPCs will increasingly be a source of information about chemical risks in the community, as information under the RMP regulation becomes available to the public.

Did you know?

According to EPA's Emergency Response Notification System (ERNS), more than 402,000 accidents involving hazardous chemicals were reported in the United States in the 12 years from 1987 to 1998. These accidents resulted in nearly 4,000 deaths, 25,300 injuries, and 1,400 evacuations affecting 147,000 individuals. Eighty percent of these reported accidents occurred at industrial and commercial facilities.

A major role for LEPCs is to work with industry and the interested public to encourage continuous attention to chemical safety, risk reduction, and accident prevention by each local stakeholder.

The public can get involved by increasing its awareness and understanding of chemical hazards and supporting actions to ensure public safety and protection of the environment.

CAA Section 112(r) Implementing Agencies

Agencies charged with implementing the RMP regulation will conduct outreach, technical assistance, training, reviews of RMPs, audits of RMPs, and inspection of risk management programs at facilities. In its Guidance for Implementing Agencies (see table of resources for how to obtain a copy), EPA notes that each state and locality will have its own approach to encouraging chemical safety. EPA will work with each interested state and/or local agency to develop an appropriate RMP implementation program.

To learn which agency is implementing the RMP regulation in your area, you can call your EPA Regional Office (see contact list at the back of this booklet), or visit the CEPPO website at http://www.epa.gov/ceppo.

WHAT IS THE RMP REGULATION?

The RMP regulation (40 CFR part 68) is designed to prevent accidental releases to the air of substances that may cause immediate, serious harm to public health and the environment and to mitigate the effects of releases that do occur.

The regulation is available from EPA. Call the RCRA, Superfund and EPCRA Hotline at (800) 424-9346 or visit EPA's website at http://www.epa.gov/ceppo.

A facility (called a "stationary source" in the regulation) is covered by the RMP regulation if:
1) It has a regulated substance… 2) …over the threshold quantity… 3) …in a process.

What Chemicals Are Covered?

The RMP regulation applies to processes at facilities that have more than a threshold quantity of any of 77 acutely toxic substances, such as chlorine and ammonia, and 63 highly volatile flammable substances, including propane. These substances are called "regulated substances" in this booklet to distinguish them from chemicals on other lists.

A new law excludes regulated flammable substances from the RMP program when those substances are used as fuel or held for sale as a fuel at a retail facility.

The law defines retail facility as a facility at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program.

The main effect of this provision is to exempt from RMP coverage all facilities that had previously been covered solely because they used flammable substances, particularly propane, for fuel (e.g., for heating, drying, etc.), and to exempt most propane distribution facilities.

Propane distribution facilities that do not meet the criteria for "retail facility" are still covered by the RMP rule.

Facilities such as oil refineries that manufacture listed flammable substances are still covered, as are facilities that use listed flammable substances for non-fuel purposes (e.g., as a chemical feedstock). Most of the acutely toxic regulated substances are also extremely hazardous substances (EHSs) under EPCRA section 302. The flammable regulated substances are all subject to reporting under EPCRA sections 311 and 312.

Each toxic regulated substance is assigned a threshold quantity under the RMP regulation that is generally higher than the threshold planning quantity for the same substance under EPCRA.

All flammable regulated substances have a threshold quantity of 10,000 pounds under the RMP regulation, the same as the threshold for these substances under EPCRA sections 311 and 312. The list of RMP regulated substances and thresholds is provided at the back of this booklet.

Tips & Hints

EPCRA section 312 reports will provide you with a list of local facilities potentially subject to the RMP regulation. However, remember that the EPCRA thresholds apply to the facility as a whole, rather than to an individual process, and thus the list of EPCRA facilities may include facilities not covered by the RMP regulation. In addition, the RMP thresholds for toxics are generally higher than the EPCRA thresholds.

The RMP thresholds are applied to individual "processes" at a regulated facility, while EPCRA thresholds are applied to the site as a whole. A process, as defined by the RMP regulation, means any activity involving a regulated substance, including any use, storage, manufacturing, handling, or on-site movement of such substances, or combination of these activities. Any group of vessels that are interconnected, or separate vessels that are located such that a regulated substance could be involved in a potential release, is considered a single process. Consequently, there may be some facilities in your community that report under EPCRA for a specific substance and might appear to meet the threshold quantity under the RMP regulation as well, but in fact are not subject to the RMP rule because they do not have a threshold quantity in a single process.

Examples of specific operations that may be regulated under the RMP rule:

- Manufacturers of inorganic chemicals and industrial gases
- Manufacturers of plastics, resins, and organic chemicals
- Petroleum refineries and gas processing plants
- Propane retailers and distributors
- Agricultural retailers who sell ammonia fertilizer
- Larger water treatment and wastewater treatment systems
- Refrigerated warehouses, warehouses that handle chemicals, and chemical distributors
- Larger industrial facilities and institutions that store propane for use as fuel

Metal and equipment manufacturers
Manufacturers of agricultural chemicals
Food businesses with large ammonia refrigeration systems
Pulp and paper mills
Large U.S. military and Department of Energy installations
Electric companies

What Facilities Are Covered?

EPA has estimated that thousands of facilities are potentially subject to the regulation, including manufacturers, warehouses, retail businesses, and public facilities. The rule does not apply to transportation, including pipelines. Regulated substances present in gasoline, when in distribution or related storage for use as fuel for internal combustion engines, also are not covered. In addition, the rule provides an exemption for the use of ammonia by farmers as a fertilizer (although not for those businesses that produce or sell ammonia to those farmers).

What Must a Facility Do?

There are five main elements of facility compliance with the RMP regulation:

1) A hazard assessment;
2) A management system;
3) A prevention program;
4) An emergency response program; and
5) A Risk Management Plan (RMP) that describes these activities.

The first four elements are described here. The Risk Management Plan is described in more detail in the next chapter.

Hazard Assessment

The hazard assessment consists of two components:

a) A five-year history of serious accidents involving the regulated substances. Every covered facility must provide detailed information on any serious accident that occurred in the previous five years and had specific impacts either on the site or in the surrounding community.

b) Descriptions of one or more potential accidental release scenarios involving the regulated substances. Every facility must analyze the potential offsite consequences of a worst-case (catastrophic) release.

EPA has defined the parameters of a worst-case scenario (such as atmospheric conditions, endpoints, and release criteria) for this analysis. In addition, if the worst-case scenario could impact the public, one or more alternative releases that are more likely to occur must be examined. (Some of these special terms are explained in the section of this booklet called "More on Offsite Consequence Analysis.")

For each release scenario, the facility must estimate the greatest distance from the facility to a point beyond which no serious acute effects are anticipated.

The facility must also identify the populations and environments potentially affected.

Tips & Hints

The RMP regulation requires every facility subject to the regulation to coordinate its response activities with the LEPC for its area or with local responders. This is an opportunity for you to:

- Ensure that you have in place a clear and quick method to notify neighbors when an accident happens
- Ensure that all call-down lists are consistent
- Coordinate operating procedures among community first responders and facility employees
- Review equipment lists to ensure you have the right equipment and that you know where it is when an accident happens
- Practice evacuation and shelter-in-place procedures with neighbors

Management System

Every facility that has a worst-case analysis showing potential offsite impacts is required to develop a management system to oversee the implementation of the Risk Management Program elements.

The management system provision also requires the facility to designate a qualified person or position with overall responsibility for the development and implementation of the risk management program elements and to document the names of people or positions and define lines of authority.

Prevention Program

The main objective of the Risk Management Program regulation is to prevent accidents from occurring, and this is done by ensuring that every covered facility implements a chemical accident prevention program. To do this, the facility must understand its hazards and integrate safety into all aspects of its processes and business.

The facility must make safety a way of life so that the risk from chemical accidents to employees and the public is minimal. The prevention program must be implemented on a daily basis if it is to achieve its goal—no chemical accidents.

The prevention program is intended to formalize a series of management practices for identifying hazards and managing the risk of a chemical accident.

A good prevention program focuses on hazard analysis, process controls, operating procedures, employee training, and maintenance activities.

Not all facilities are required to develop a prevention program. A facility with only Program 1 processes (see box on next page) is not subject to prevention program requirements and will provide no data on its prevention activities.

Facilities May Have Processes Subject to Different Risk Management Requirements Based on the Different Risks They Present

Program 1 Processes

No accidental releases resulting in offsite impacts within five years of RMP submittal
No public receptors in worst-case scenario zone and
Emergency response procedures coordinated with local emergency organizations

Program 2 Processes

Not eligible for Program 1 or subject to Program 3

Program 3 Processes

Not eligible for Program 1 and
Subject to OSHA process safety management standard or in NAICS code 32211, 32411, 32511, 325181, 325188, 325192, 325199, 325211, 325311, or 32532

Emergency Response Program

At a minimum, every facility subject to the regulation must coordinate its response activities with the LEPC for its area or with local responders.

In addition, if a facility will use its own employees to respond to releases (for example, with a facility hazmat team), the facility must implement a full emergency response program that includes a plan, training, and plan review and updates. The facility may choose to develop one plan following National Response Team guidance (available at http://www.epa.gov/ceppo). The facility must coordinate its plan with its LEPC plan.

Different Requirements for Different Kinds of Facilities

Facility risk management programs will vary. The RMP regulation requires facilities to develop a program that reflects the different levels of risk and complexity that different processes pose.

A process falls into one of three categories—Program 1, Program 2, or Program 3—based on accident history, worst-case scenario results, and industrial sector.

In general, Program 1 processes are less complex, pose less risk to the public, and have had no accidents with offsite consequences. Program 2 and 3 processes are more complex and have worst-case scenarios that would impact the public.

The compliance requirements for Program 1 processes are less stringent than are the requirements for Program 2 and 3 processes, which are also more formal.

RMPS ARE COMING!

The RMP describes the activities that each facility is conducting to comply with the regulation, its "risk management program." Initial RMPs were submitted to EPA by June 21, 1999.

The information in the RMP will be updated every five years or sooner under certain circumstances, including major changes to the facility or its covered processes.

In addition, facilities will keep additional supporting documentation on their risk management program on site.

Tips & Hints

- The executive summary can be used by the community as a background piece for events involving the facility, such as developing exercises and contingency plans. In the Kanawha Valley in West Virginia and in Augusta, Georgia, the executive summaries have been used as a tool to provide information to the public.
- NAICS codes are a new industrial classification system that is replacing the Standard Industrial Codes (SIC).
- LEPCs can compare the new RMP registration information with existing EPCRA data about the facility. This is an opportunity to update "Facility" data in CAMEO.
- For alternative release scenarios, the facility can choose modeling parameters (e.g., typical weather and atmospheric stability information) that fit the local situation.

What Information Is in an RMP?

An RMP consists of an executive summary in text form as well as answers to a series of questions focusing on individual elements of the risk management program.

The latter information is reported as data, such as names, dates, multiple choice selections, and "yes" or "no" answers.

Each RMP will contain information on the identity of the facility, its offsite consequence analysis, five-year accident history, prevention program, and emergency response program. The RMP is not like a contingency plan—even though we call it a "plan."

The RMP is primarily a series of data fields with numbers, words and phrases, and yes/no answers to specific questions.

You can use information in the data fields to understand steps the facility is taking to prevent or respond to a possible accident; for example, there will be information about employee safety training, inspections by non-facility personnel, equipment maintenance, and management oversight.

Executive Summary

The executive summary in the RMP is your introduction to the facility. This section includes a brief description of the facility, its primary operations and processes, and the regulated substance(s) handled. The executive summary also reviews the release scenarios from the offsite consequence analysis; general and chemical-specific release prevention activities; the five-year accident history; the emergency response program; relevant facility response and prevention policies; and any planned changes to improve safety.

Registration

The registration section in the RMP provides information about the facility (e.g., street address and emergency contacts) and the processes in which regulated substances are found.

The facility-specific data include points of contact for emergencies and risk management program questions as well as standard address information.

For each covered process, the registration section lists the regulated substances (and quantities) in the process, the program level of the process, and the North American Industry Classification System (NAICS) code for the process. The NAICS code identifies what the process does (for example, water treatment or metal plating). These data will help you identify specific operations at a facility or compare them with similar operations elsewhere.

Offsite Consequence Analysis

Facilities with any Program 1 processes must include at least one worst-case release scenario in their RMPs. Facilities with Program 2 or Program 3 processes must include in their RMPs information about both worst-case release and alternative release scenarios. The number of scenarios depends in part on the type and number of regulated substances in covered processes. EPA has defined many of the release modeling parameters for the scenarios, although some facility-specific data (for example, certain weather conditions) can be used.

In the RMP, facilities report the modeling parameters and dispersion model(s) they used to do their offsite consequence analyses. You can use this information to "re-create" a facility's results, using CAMEO and ALOHA, EPA's Offsite Consequence Analysis Guidance, or RMP*Comp (available at http://www.epa.gov/ceppo). For each release scenario, facilities report in the RMP the distance beyond which no serious, acute effects are anticipated; the residential population within that distance (in all directions from the point of release); and which categories of public receptors (for example, schools, residences, hospitals, commercial/ industrial areas) or environmental receptors (national/state parks, wildlife sanctuaries, and federal wilderness areas) are located within that distance. Facilities may choose to submit a graphic file to illustrate each scenario on a local map.

Five-Year Accident History

The accident history that facilities report in their RMPs provides information on each accidental release from a regulated process that resulted in specific on-site or offsite impacts during the preceding five years, in greater detail than the EPCRA section 304 reports that you have received in the past. Releases from non-covered processes, even if they involved regulated substances, or releases of non-listed substances from covered processes, are not included.

For each accidental release reported in the accident history section of the RMP, facilities report standard descriptive information, as well as some new information such as the weather conditions, onsite and known offsite impacts, the initiating event and contributing factors, whether offsite responders were notified, and any changes made at the facility as a result of the accident.

Tips & Hints

- As you review the data about potential offsite consequences that facilities report in their RMPs, keep in mind that air modeling uncertainties are significant and different models are likely to produce different results. (For more information, including explanations of some of the special terms used when discussing offsite consequence analysis, see "More on Offsite Consequence Analysis")
- Workers at the facility and local residents may consult the accident history information as they try to understand previously unexplained odors and gas clouds coming from the facility. However, such events will only be included in the accident history if they meet the RMP rule's criteria for reporting an accident.
- LEPCs may want to compare the prevention program information for a local facility with that of a similar facility in the community, the state or even the nation. The LEPC might be able to work with facilities (privately, or through discussion at open meetings) to introduce safety practices that are effective at another facility.

Prevention Program

In the RMP, facilities report prevention program information separately for each covered process. This section of the RMP identifies the major hazards for the process; the relevant process controls, mitigation systems, and detection and monitoring systems; and any changes made to the process since the last hazard evaluation. This section also provides dates indicating when specific prevention activities (for example, updates of procedures) were last conducted. This information provides a basis for comparing similar operations at different facilities.

Facilities must retain a substantial amount of supporting documentation to comply with program requirements of the RMP regulation. While facilities are required to make this documentation available to EPA or the state implementing agency, they are not required to make it available to the public. If certain items are of interest to you or to members of the public, you may want to talk to facilities about making this information available. Much prevention program documentation will relate to internal tracking or standard work records, but there will also be hazard review or PHA (process hazards analysis) recommendations, compliance audit reports, and accident investigation reports. EPA is encouraging facilities to make as much of this information as possible (or some form of summary) available to the public if requested. Because the RMP regulations expand the information collection authority granted to LEPCs under

EPCRA section 303(d)(3) to apply to facilities with flammable regulated substances, the LEPC can get any of this information that is necessary to develop an emergency plan.

Emergency Response Program

The RMP does not provide detailed information on the facility emergency response program. There is a series of yes/no questions indicating whether the facility has a response program and also some dates indicating when specific activities (for example, drills or exercises, plan review) were last conducted. Facilities that have chosen to develop their own response capability will keep an emergency response plan and procedures on site. As noted above, the LEPC can request this information from all facilities subject to CAA section 112(r) in developing an emergency plan.

Confidential Business Information

Facilities can claim some RMP data as confidential business information (CBI). An LEPC interested in obtaining data claimed CBI may request that EPA determine whether the claim is valid. If EPA determines that the information is not CBI, and after EPA has notified the facility claiming CBI, the information may be released. If EPA determines that the information is CBI, an LEPC may nonetheless be able to obtain the information under 40 CFR 2.301(h)(3), which provides for sharing of CBI with state and local governmental agencies having responsibilities under the CAA or its implementing regulations. However, LEPCs can gain access to CBI data under this rule only if they can protect its confidentiality.

Under EPCRA section 303(d)(3), LEPCs may compel an EPCRA section 302 facility to provide any information necessary to enable the LEPC to develop and implement an emergency plan. An EPCRA section 302 facility must comply with such LEPC requests for information even if the facility has made a valid CBI claim under the RMP regulation.

How Can LEPCs Access RMPs?

EPA has placed RMPs, except for the offsite consequence analysis information, on the Internet in a format that allows the public to search them and download any that are of interest. This database, called RMP*Info, is located with other EPA data in Envirofacts on the Internet at http://www.epa.gov/enviro.

To simplify access by state and local governments, EPA will set up separate databases containing the full RMPs for all of the facilities in each state. Additionally, EPA will provide software, called RMP*Review, for use by implementing agencies, LEPCs, and others to manage their databases. Please contact your EPA Regional Office CEPP contact for details (see Appendix B).

terms

Worst-Case Modeling Parameters

- Toxic endpoints: as specified in the regulation for each regulated toxic substance
- Flammable endpoints: 1 psi for all flammable substances
- Wind speed: 1.5 meters/sec (unless the facility can prove this has not occurred in the last 3 years)
- Stability class: F (unless facilities can prove this has not occurred in the last 3 years)
- Ambient temperature: highest daily maximum temperature in past three years
- Humidity: average humidity for the site
- Height of release: ground level
- Surface roughness: urban or rural
- Gas density: model must account for whether or not gases are heavier than air
- Temperature of substance: highest daily maximum for past three years or process temperature, whichever is higher (for liquids only)

MORE ON OFFSITE CONSEQUENCE ANALYSIS

Not all LEPC members may have an extensive technical background, but you will want to (1) understand how a facility derives its worst-case and alternative release scenarios and (2) be familiar with the underlying terminology. The following are answers to some of EPA's most frequently asked questions.

Q: What Is Meant by a Worst-case Release Scenario?

EPA has defined a worst-case release as the release of the largest quantity of a regulated substance from a single vessel or process line that results in the greatest distance from the point of release to a specified endpoint. EPA requires that the worst-case release scenario incorporate certain parameters related to the chemical released, conditions of the release, atmospheric conditions, and health effects of concern ("toxic or flammable endpoints"). Facilities use these parameters to estimate the distance away from the location of a release beyond which no serious, acute effects are anticipated. These parameters are discussed in more detail below.

Q: What Is Meant by an Alternative Release Scenario?

The RMP regulation requires Program 2 and 3 facilities to project potential releases of regulated substances that are more likely to occur than worst-case scenarios and to predict the consequences of such releases. These are called alternative release scenarios. The RMP regulation provides information that facilities must use for such predictions as part of doing the offsite consequence analysis required for the risk management program at the facility.

Q: What Is a Toxic Endpoint?

A toxic endpoint is the endpoint for a regulated toxic substance. For a particular regulated substance, it is the concentration of that substance in air below which it is believed that most people could be exposed for up to one hour without serious health effects. EPA has determined toxic endpoints for each of the regulated toxic substances. The toxic endpoints are listed in the RMP regulation.

Q: What Is a Flammable Endpoint?

A flammable endpoint is the endpoint for a regulated flammable substance. How it is measured depends on the type of release considered. For example, the flammable endpoint for a vapor cloud explosion is based on the pressure from the resulting blast wave. The flammable endpoints to use for different types of releases are provided in the RMP regulation.

Q: What Is a Stability Class?

Pasquill stability classes (ranging from “A” to “F”) are meteorological categories of atmospheric conditions. Pasquill stability class A represents unstable conditions under which there are strong sunlight, clear skies, and high levels of turbulence in the atmosphere, conditions that promote rapid mixing and dispersal of airborne contaminants. At the other extreme, class F represents light, steady winds, fairly clear nighttime skies, and low levels of turbulence. Airborne contaminants mix and disperse far more slowly with air under these conditions, and may travel further downwind at hazardous concentrations than in other cases. Stability class D, midway between A and F, is used for neutral conditions, applicable to heavy overcast, daytime or nighttime.

Q: What Is the Distance that Facilities Must Estimate for Their Release Scenarios?

Facilities must estimate the distance from the location of a release to the endpoint that could result from the accidental release of a regulated substance. They must estimate this distance for each release scenario in their RMP. To understand what populations could be at risk from an accidental release, the facility is to draw a circle with the facility at the center. The radius of the circle is the distance to the endpoint.

Q: How Is The Distance to an Endpoint Estimated?

Facilities estimate the distance to an endpoint by first estimating the amount of a regulated substance that would be released in an incident (either a worst-case release scenario or an alternative release scenario), and then using air dispersion modeling techniques (or a tool that incorporates such techniques) to estimate the distance to an endpoint for that amount of the regulated substance. Note that the distances that facilities report in their RMPs are estimates. EPA has guidance documents (Offsite Consequence Analysis Guidance as well as industry-specific guidance for developing RMPs) and software (RMP*Comp) to help facilities estimate the distances. Facilities may use EPA’s guidance or any other air dispersion modeling techniques provided that the techniques meet certain conditions as outlined in the RMP regulation.

What about the Approach in the "Green Book"?

EPA, DOT, and FEMA published Technical Guidance for Hazards Analysis (commonly known as the Green Book) in 1987. Many LEPCs have been using the Green Book to estimate vulnerable zones for chemicals in the community. The release modeling done for the RMPs will be based on parameters similar to those in the Green Book, but with some differences. (For example, the RMP regulation specifies parameters not used in the Green Book approach. Also, in recent years toxicologists have refined the toxic endpoints for some chemicals.) EPA encourages LEPCs to use the Offsite Consequence Analysis Guidance approach to modeling releases for any subsequent planning, so the results reported by industry in their RMPs will be comparable to those the LEPC calculates.

Appendix C of this booklet is a detailed comparison of the Green Book methodology and the methodology in EPA's Offsite Consequence Analysis Guidance.

Q: What Is Meant by Air Dispersion Modeling Techniques?

Air dispersion modeling techniques are mathematical models that are used to estimate the distance that a released substance would travel from the location of the release to the endpoint, given the amount of the substance released and certain conditions of the release. The estimated distance will vary depending on the air dispersion model used.

Q: How Certain Is The Distance to The Endpoint?

For a given scenario, people can use different release models and obtain predictions of the distance to an endpoint that may vary significantly. Even using the same model, different input assumptions can cause wide variations in the predictions. LEPCs need to recognize that the predicted distances lie within a considerable band of uncertainty and communicate this fact to the public when they discuss the scenario results. Differences in models may explain why two facilities handling the same covered substances in the same amounts may have come up with different results. (Of course, differences in prevention programs may also account for different results, particularly in the case of alternative release scenarios.) EPA's approaches are generally intended to produce conservative results—they are more likely to overestimate distances. For other models, you may want to ask the facility for an assessment of where its distance prediction lies within the plausible range of uncertainties.

Q: If There Is an Accident, Will Everyone Within the Distance to the Endpoint Be Hurt?

In general, no. For an explosion, however, everyone within the circle would certainly feel the blast wave because it would move in all directions at once. However, while some people within the circle could be hurt, it is unlikely that everyone would be. But releases usually do not lead to explosions. A fire is more likely than an explosion, and fires are usually concentrated at the facility. For toxic chemicals, the released chemicals would usually move in the direction of the wind. Only people in a small fraction of the circle would be exposed if a release occurred. Whether someone is hurt depends on many factors, such as whether the chemical is dispersed by the wind, or if the release is stopped quickly. Generally, it is the people who are closest to the facility who face the greatest danger. Although it is not impossible for people beyond the distance to the endpoint to be hurt, it is much less likely. However, the risk should not be dismissed. The RMP regulation assumes that a worst-case release involves the failure of the single largest vessel containing a regulated substance at the facility. It is conceivable, although highly unlikely, that more than one vessel could fail at the same time, resulting in a larger release than the worst-case scenario predicts. In such a case, people beyond the distance to endpoint could be affected.

Q: How Likely Are the Worst-case and Alternative Release Scenarios?

It is generally not possible to provide accurate numerical estimates of how likely it is that these scenarios will actually happen. Quantifying risk for accident scenarios is rarely feasible because there are few data related to rates for equipment failure and human error. In general, the risk of a worst-case scenario occurring is low. Although catastrophic vessel failures have occurred, they are rare events. Combining them with worst-case weather conditions (as required by the RMP regulation) makes the overall scenario even less likely. This does not mean that such events cannot or will not happen, but they are very unlikely to happen. For the alternative scenario, the likelihood of the release is greater and will depend, in part, on the scenario chosen.

Tips & Hints

Ideas for LEPC Effectiveness

Have you tried to revitalize your membership recently? In some cases, a new SERC chair or a new LEPC chair is able to recruit new members for the LEPC.

As with every committee, one or two active new members can energize the entire LEPC.

Have a clear agenda. Start (and end!) your meetings on time.

If you have subcommittees, check with them a few weeks before the full LEPC meets. Be sure that the subcommittees do their work in advance.

LEPCS COORDINATE CHEMICAL SAFETY ACTIVITIES IN THE COMMUNITY

Get Everyone Involved

LEPCs should have broad-based membership that includes, at a minimum, representatives of elected officials, law enforcement, emergency management, fire service, emergency medical services, healthcare professionals, local environmental and transportation groups, hospitals, the media, community groups, and owners and operators of the facilities covered under EPCRA.

Wide-ranging community involvement will increase the credibility of the LEPC plan and improve community cooperation in an emergency.

Both EPCRA and the RMP regulation assume that citizens want chemical safety in the community. Including concerned citizens on the LEPC and inviting them to your meetings will promote communication between industry and the public, foster understanding of chemical hazards, and help quell rumors.

Enhancing LEPC-Industry Relations; Encouraging Compliance

Since EPCRA passed in 1986, a rule of thumb is that effective LEPCs include active and committed industry representatives. Industry representatives bring expert understanding of chemicals and chemical processes. Numerous facilities have provided financial and other support to make LEPCs successful.

The RMP regulation provides specific opportunities for you to work more closely with the facilities in your community on risk communication, accident prevention and risk reduction, and compliance assistance. (See the later sections for discussions of risk communication and accident prevention.) As you work with facilities through these and other issues, you may become the organization they turn to when they need to understand community concerns and help in providing constructive answers to questions from the public. In helping them, you can work to ensure that they address community issues related to chemical safety quickly and accurately, which will, in turn, make your LEPC the group on which the community relies.

Depending on the skills of your membership, the LEPC may be able to serve as a local source of RMP compliance assistance. Although you may not want to become involved with more technical issues, almost all of the RMP program elements are well-suited to your involvement.

Release Modeling

EPA has provided free copies of CAMEO (a software program that helps LEPCs manage and interpret information about a facility and its chemical inventory) to more than 2,000 LEPCs.

Using ALOHA and LandView (a software program that provides Census Bureau data and helps users map facilities and nearby populations), LEPCs can now assist facilities in conducting the offsite consequence analysis required by the RMP regulation.

Small businesses will appreciate help in collecting and entering their release modeling data and identifying public and environmental receptors that could be impacted by a release. LEPCs can then incorporate this updated facility information into the community plan.

Users should be aware, however, that ALOHA has some limitations which may make it unsuitable for RMP offsite consequence analysis modeling in certain situations.

For example, ALOHA does not have the capability to model the offsite consequences of flammable substance releases, and for toxic substances, ALOHA only provides endpoint distances out to a maximum of 6 miles from the source (large releases of certain chemicals, such as chlorine, will exceed this distance under worst-case conditions). If you desire to conduct RMP OCA modeling in these and other situations for which ALOHA is unsuitable, you should use a different model.

One such model is RMP*Comp. RMP*Comp is a software program designed by EPA and the National Oceanic and Atmospheric Administration (NOAA) specifically for the purpose of conducting RMP OCA modeling.

It follows the methods and techniques described in EPA's RMP Offsite Consequence Analysis Guidance.

RMP*Comp is capable of providing OCA modeling results for all 140 RMP regulated substances and provides endpoint distances out to a maximum of 25 miles. RMP*Comp is available for free—you can download it from the Internet (http://www.epa.gov/ceppo) or order a copy from the National Service Center for Environmental Publications (NSCEP) at 1-800-490-9198.

Tips & Hints

In June 1996, EPA and the other National Response Team (NRT) agencies published integrated contingency planning ("One-Plan") guidance. The NRT encourages facilities to develop one plan to comply with all federal contingency planning requirements (rather than develop separate plans for each regulation). EPA, the Coast Guard, the Office of Pipeline Safety at the U.S. Department of Transportation, OSHA, and the Minerals Management Service promised to accept the one-plan format whenever a facility must submit a contingency plan to them for review and approval. To obtain copies of the one-plan guidance, contact EPA’s Hotline at (800) 424-9346.

Working with Small Businesses

Local planning and response officials can help small businesses sort out facility-specific preparedness issues, identify response resources, and formalize their emergency response program.

The RMP regulation also may serve as an incentive for facilities to adopt the “One Plan” approach and formalize incident command issues. This provides a perfect opportunity to discuss mutual aid agreements and joint training and exercise programs.

Response Coordination

Facilities that do not have their own response team must coordinate with the LEPC concerning listed toxic chemicals, and with the fire department about listed flammable chemicals. Local fire officials, in conjunction with the building inspector, can work with facilities to improve fire prevention practices, including compliance with NFPA standards or other fire and related codes.

Industry Outreach

LEPC industry representatives can provide other facilities with technical assistance or contacts for further information on a variety of prevention program issues.

Assistance could include explaining issues related to the OSHA Process Safety Management (PSM) Standard (a regulation requiring certain facilities to implement accident prevention activities similar to those described) or help in collecting and understanding safety information, industry safety standards, or approaches to employee training and equipment maintenance.

New Partnerships

The availability of RMP information also provides LEPCs with an opportunity to develop new partnerships with other organizations in the community. People and groups may need to be reminded that you have available much specific information about chemicals in your community. Although they may not be interested in the entire RMP, medical professionals, the news media, planning/zoning officials, and researchers will likely find specific sections of the RMPs from local facilities of particular interest. Working with them will further extend the reach of the LEPC into the community, creating a stronger constituency for the LEPC that enables you to take advantage of a wider base of skills and experience. Medical professionals (including emergency medical technicians, doctors in private practice, health clinics, and hospitals) will appreciate information on potential acute health hazards as well as the recommended treatment for exposures. Distributing a list of nearby facilities and their regulated substances can assist in the first step; if the medical professionals are interested, you can request a copy of the emergency response plan and then selectively send out the first aid and emergency medical treatment information. At the same time, keep in mind that clinics and hospitals will want to know if they are potentially vulnerable to an air release.

The news media can play an effective role in risk communication. If you do not already have regular representation from local newspapers and radio and television stations on your LEPC, this is a great time to get them involved. Now that the RMPs are available, you are in a position to work with the news media to spread the risk reduction message in your community.

You might consider producing press packets to help the local news media understand and use RMP information. At the same time, you can describe the other related activities of the LEPC and get additional exposure for efforts such as commodity flow studies and field exercises.

You may have multiple audiences within the news media. While news reporters with an interest in environmental, public safety, and health issues will likely find RMP information intriguing, broadcast meteorologists may actually be the best people for discussing the dispersion of air releases with the public. The accidental release scenarios in the offsite consequence analysis will provide local planning and zoning officials with more information when they address development issues. Being aware that a new school, hospital, residential area, or shopping center could be directly affected by a facility using an acutely toxic or highly flammable substance can only improve the decision-making process.

Engineering and environmental professionals, and researchers at local colleges and universities, are likely to find RMP information of even greater interest than EPCRA and other environmental data. If there are specific operations or types of facilities of significant concern to the community, these individuals may be willing to share with you the burden of analyzing the relevant data and communicating it to the public.

Talk with Neighboring Communities

Consult with your neighboring LEPCs, especially if you have common chemical risks and concerns. If two or more adjacent localities have similar facilities or facilities affecting more than one LEPC, you can split up the work of collecting and comparing RMP information. Using fewer resources, you will be able to produce results and share them with others. Such efforts can also serve as the basis for risk reduction and further coordination, including joint training and field exercises, mutual aid agreements, and pooling of financial resources to accomplish larger-scale initiatives.

In an emergency, you may have to call on neighboring communities for help or they may call you. In many cases, contingency plans must include several communities to be effective. Consider the need to:

1) Identify whom to call in other planning districts if you need help in an emergency;
2) Ask them how they are funding their activities;
3) Identify available response equipment and personnel;
4) Negotiate procedures for mutual assistance for emergencies that cross boundary lines;
5) Coordinate your hazards analyses;
6) Coordinate your review of transportation routes; and
7) Investigate sharing computers or other resources.

In addition to these planning and response activities, talk to your neighbors about steps you can take together to prevent chemical accidents. You might go together to visit a facility that has a note-worthy safety record. You might invite an expert in process safety management to speak to a joint meeting of your LEPCs (and invite the public to attend!). Each LEPC should consider its neighboring LEPCs as partners and sources of help. Other LEPCs share your problems; working with them may help you find common solutions.

RISK COMMUNICATION: LEPCS ARE A BRIDGE BETWEEN THE PUBLIC AND LOCAL INDUSTRY

Both the EPCRA and RMP regulations provide an opportunity to promote and strengthen dialogue between the community and industry on accident prevention and chemical emergency preparedness issues. Risk communication is an opportunity to build a level of trust among the LEPC, companies with hazardous chemicals, and the community at large.

One of the most important factors that affects people's perceptions about risk is whether they feel in control. Offer people a means to participate in decision-making about chemicals in the community. Because LEPCs include representatives from government, industry, and citizen groups, they offer a good setting for encouraging the different interests to work together.

Keep in mind the importance and legitimacy of public concerns about chemicals in the community. People generally are less tolerant of risks they cannot control than of those they can. For example, most people are willing to accept the risks of driving because they have some control over what happens to them. However, they are generally less comfortable accepting the risks of living near a facility that handles hazardous chemicals if they feel that they have no control over whether the facility has an accident. The Clean Air Act's provision for public availability of RMPs, along with EPCRA's requirements for providing annual reports on hazardous chemicals, gives the public an opportunity to take part in reducing the risk of chemical accidents that might occur in your community.

Interested citizens may independently obtain RMPs (except for CBI). These citizens might then ask LEPCs to explain the information in the RMPs. Although it often is left to technical experts, educating the public about risks and involving them in decisions about what is an "acceptable" level of risk are important challenges for LEPCs.

Basic Rules of Risk Communication

Risk communication means establishing and maintaining a dialogue with the public about the chemical hazards in your community and discussing the steps that have been or can be taken to reduce the risk posed by these hazards. There are seven "rules" of risk communication that have been developed based on many experiences of dealing with the public about risks.

1) Accept and involve the public as a legitimate partner
2) Plan carefully and evaluate your efforts
3) Listen to the public's specific concerns
4) Be honest, frank, and open
5) Coordinate and collaborate with other credible sources
6) Meet the needs of the media
7) Speak clearly and with compassion

There is an informal eighth rule for risk communication: Know what you are talking about. Not everyone on the LEPC will know everything about hazardous chemicals. Call on chemical engineers, health professionals, scientists, and school teachers (e.g., science, chemistry) to help you. Retired professionals are frequently helpful.

Hazards Versus Risks

Hazards are inherent properties that cannot be changed. Chlorine is toxic when inhaled or ingested; propane is flammable. There is little that you can do with these chemicals to change their toxicity or flammability. If you are in an earthquake zone or an area affected by hurricanes, earthquakes and hurricanes are hazards. When a facility conducts its hazard review or process hazards analysis, it will identify hazards and determine whether the potential exposure to the hazard can be reduced in any way (e.g., by limiting the quantity of chlorine stored on-site).

Risk is usually evaluated based on several variables, including the likelihood of a release occurring, the inherent hazards of the chemicals combined with the quantity released, and the potential impact of the release on the public and the environment. For example, if a release during loading occurs frequently, but the quantity of chemical released is typically small and does not generally migrate offsite, the overall risk to the public is low (even though workers may be at risk). If the likelihood of a catastrophic release occurring is extremely low, but the number of people who could be affected if it occurred is large, the overall risk may still be low because of the low probability that a release will occur. On the other hand, if a release occurs relatively frequently and a large number of people could be affected, the overall risk to the public is high.

The RMP regulation does not require facilities to assess risk in a quantitative way because, in most cases, the data needed to estimate risk levels (for example, one in 100 years) are not available. Even in cases where data such as equipment failure rates are available, there are large uncertainties in using those data to determine a numerical risk level for any given facility. Therefore, you may want to assign qualitative values (high, medium, low) to the risks that you have identified at facilities in your community, but you should be prepared to explain the terms if you do. For example, if you believe that the worst-case release is very unlikely to occur, you must give good reasons; you must be able to provide specific examples of measures taken to prevent such a release, such as installation of new equipment, careful training of workers, and rigorous preventive maintenance. You can ask facilities to provide documentation to support claims about the level of risk.

Tips & Hints

Who Will Ask Questions?

- Persons living near the facility or working at a neighboring facility
- Special interest groups including environmental organizations, police departments, zoning and planning boards, chambers of commerce, unions, and various civic organizations
- Journalists, reporters, and other news media organizations
- Medical professionals, educators, and consultants

Three Scenarios When You May Need to Communicate with the Public about Chemical Risk

Scenario A: During or immediately after an accidental chemical release

When there is an accident, the news media and the public always have questions. First they might ask:

- What is going on?
- Am I or my children at risk?
- Should we evacuate or shelter in place?
- What are you doing to stop this accident from spreading?

A little while later, they might ask:

- How did this happen?
- How long will we feel "short-term" health effects?
- Are there any hidden health effects?
- What are you doing to prevent this from happening again?

To answer questions like these, you will need to have a community emergency plan and know the contents of that plan. Do you have a record of chemicals in the community and what their potential health effects are? Do you identify an emergency contact for each facility in the community? Does your emergency plan include clear provisions for determining whether evacuation and/or sheltering in-place might be necessary? Has one person (or office) been assigned to provide information to the public? Have you prepared sample press releases so that you can quickly provide helpful information to the public? Do you have procedures for telling the public about upcoming LEPC meetings so that the public can attend and ask questions? Have you worked with the mayor's office and local response agencies to ensure that the LEPC is the focal point for risk communication?

Scenario B: Routine or past accidental releases of chemicals

After accidental releases, the news media and the public may become more interested in chemical hazards in the community. They may search the Toxic Release Inventory (TRI) available under EPCRA section 313 for more information about chemical releases. They may search for information provided under the RMP regulation about accidental releases during the past five years. This search could lead to newspaper articles and television reports about chemicals being released in the community. You may then hear questions like these:

- What risk do these exposures pose for my family?
- Do these emissions affect our health?
- Why are facilities allowed to release these chemicals?
- Is the facility in compliance with federal, state, and local laws?
- Are there other facilities that should be reporting similar events?

The LEPC might take several actions. Invite a toxicologist or a doctor to an LEPC meeting to discuss specific chemical hazards with the public. Share your information about other facilities in the community. Share information on the risk management program regulation and EPCRA. Invite the facility emergency coordinator to explain steps the facility takes to prevent serious accidents even though there are routine releases. Work with facilities to take action to reduce risk.

Scenario C: Chemicals Stored in the Community

The search of TRI and RMP databases could eventually lead to stories about all the chemicals stored in the community. The public and the news media may then ask questions like these:

- Are the chemicals stored properly?
- What are the chances of dangerous chemicals leaking?
- Can these stored chemicals lead to an accident?
- If these chemicals are released, what could be the health effects?
- Can we reduce the amount of chemicals stored in the community, and use less hazardous chemicals and inherently safe technologies?
- What else can we do to reduce the risk of accidents?

In this instance, the LEPC can turn to all the data it has collected from EPCRA and RMP reports. These questions can be more easily addressed if you have one software program like CAMEO to manage data. You may also want to hold a meeting that includes facility representatives so that everyone can discuss realistic steps to prevent accidental chemical releases in the community.

A Special Case: Dealing with Worst-Case Scenarios

In the beginning, public interest might focus on the worst-case scenario, rather than on prevention and preparedness. Worst-case scenario information must be explained to the public in a way that promotes perspective and understanding, rather than confusion. The experience of the heavily industrialized Kanawha Valley of West Virginia illustrates how worst-case scenario data can open lines of communication between industry and the public.

Despite fears that information on worst-case scenarios would produce strong negative reactions toward local industry, the chemical industry worked with EPA and state and local officials to release worst-case data well ahead of the RMP rule schedule. The Safety Street demonstration proved that the public could understand information on potential accidents and risks and act constructively. Due in part to a pro-active approach by industry, and with the sponsorship of the LEPC, the public evaluated the information presented to the community and was able to take part in a constructive dialogue with industry and public officials.

Potential Risk Communication Activities

1. Open a risk management dialogue with facility owners/operators, community leaders, and the public to focus on risk reduction activities.
2. Understand how the public will access information and what impact this will have.
3. Reach out to the small business community. Many small facilities will not have the expertise or resources to respond effectively to the technical questions that their RMPs may produce. By reaching out to them, you can help develop a more community-wide approach to addressing risk management questions.
4. Identify key issues of concern in your community. Use LEPC meetings as a forum to collect and document concerns, which then can be forwarded to individual facilities, as appropriate.
5. Schedule follow-up meetings or presentations at other public gatherings to allow LEPC and industry representatives to respond to these issues.
6. Draw upon sample questions and answers contained in the Risk Communication chapter of EPA's General Guidance on Risk Management Programs. Work with industry to understand the underlying issues and develop answers to specific questions, focusing on actual or potential risk reduction actions.
7. Plan a special meeting to unveil local RMPs.
8. Work with the news media to reach a wider audience.
9. Explore using community bulletin boards on local access cable television stations and community Internet sites.

Respond to Concerns

LEPC involvement creates a process through which people, who otherwise might be mistrustful or even adversarial, can work together to understand, address, and prepare for chemical risks in the community.

Sometimes, anger about what the public perceives as risky situations arises not so much from the actual risk but from people's feeling that they have no control over what is happening to them.

You can reduce this by including the public as a partner in discussions about what is an acceptable risk in your community and how to reduce risks.

An LEPC that arms itself with basic information about the RMP program, makes an effort to look at the RMPs for facilities in the community, and encourages facilities to involve the LEPC, response agencies, and the public in a discussion of these plans and the risks they disclose will do a great service to the community.

Tips & Hints
Setting Priorities

Let us say there are six facilities in your community submitting worst-case releases scenarios for toxic regulated substances: two have worst-case distances greater than six miles, two have worst-case distances of approximately three miles, and two report distances of less than one mile. As a first step, you might rank them into three categories by distance.

A further look at the RMP data may reveal that the two facilities with the greatest distances are located more remotely from populated areas than the two with the smallest distances. As a result, the former may have estimated that their worst case would impact a much smaller residential population, and the latter may have reported that there also are schools and a hospital within their worst-case distance. The RMP will provide a straightforward way of considering these factors without having to research or analyze the data on your own.

IMPROVING YOUR EMERGENCY PLANS

Several elements of the RMP regulation requirements support your local emergency planning process. The offsite consequence analysis can provide you with detailed information to continue prioritizing and planning for chemical hazards in the community.

While EPA does not consider the worst-case release scenario to be the most realistic basis for response planning, you may be able to use the distances or the population potentially affected to set priorities.

The alternative release scenarios, which may be based on actual incidents (either at the facility or within the industry as a whole) or the results of the facility hazard evaluation, are intended to represent realistic events for planning purposes.

You will want to meet with facility officials to discuss the details in the alternative scenario(s) and work together to ensure that the community response plan realistically addresses the alternative scenarios.

This activity will help you meet the EPCRA requirement to update your community plan annually.

The alternative scenarios can also provide a useful basis for an exercise.

The RMP regulation supplements the information-gathering authority granted under EPCRA section 303(d)(3) to local planning and response officials.

Now, in addition to EPCRA section 302 facilities, facilities with flammable regulated substances must provide LEPCs and emergency planners, upon request, any information necessary for developing and implementing the community emergency response plan.

The emergency response program provisions of the RMP regulation ensure that all facilities with a substantial inventory of highly volatile flammable substances work with the fire department or the LEPC if they also have highly toxic substances, as was done for acutely toxic substances under EPCRA section 302.

Even if the facility will not respond to a release (for example, with its own hazmat team), it still must coordinate with you or the fire department on response actions and ensure that a system for emergency notification is in place.

This requirement means that the facility must be certain that local responders can handle potential releases.

If responders do not have the training or equipment to respond to a particular type of chemical release, the facility must arrange for an appropriate response (for example, by establishing a mutual aid agreement with an industry response team).

What You'll Find in the RMP

Based on a hazard review or process hazard analysis for each covered process, a facility will list in the RMP:

- The regulated substances in the process;
- The NAICS code for the process;
- The major hazards of the chemicals (toxic release, fire, explosion) and of the process (for example, overfilling, over-pressurization, runaway reaction);
- The process controls in use;
- Any mitigation systems; and
- Information on whether the facility has monitoring or detection systems.

For Program 2 processes, the RMP will also include a list of industry codes and standards that the facility complies with for the process.

WORKING WITH INDUSTRY TO PREVENT ACCIDENTS

The RMP regulation is intended to prevent chemical accidents and mitigate the consequences of the accidents that do occur. Facilities will take the first step in achieving this goal when they develop and implement their risk management program, especially in the formal elements of the prevention program. However, the availability of RMP information (particularly the offsite consequence analysis and the results of the hazard evaluation) is expected to encourage the second step of this process: an ongoing dialogue between the community and industry leading to practical changes that can reduce the risk of a chemical accident.

As with emergency preparedness, the LEPC should serve as the forum for the community and industry on accident prevention. You will want to meet with facility officials to discuss the offsite consequence analysis, understand the facility's prevention program, and perhaps suggest additional steps to prevent accidental chemical releases.

Using RMP*Info, the national RMP database, you will be able to gather the information necessary to compare practices at local facilities with other facilities in the same industry in your state or even in other parts of the country. RMP*Info will let you search on particular chemical and NAICS code to identify other facilities that use the same regulated substance in the same type of process as the local facility of interest to you (for example, chlorine for water treatment). Information on the number of employees will help you focus on facilities of similar size, which will make the comparisons more appropriate.

Tips & Hints

With RMP data from other facilities, you can make comparisons with a local facility by asking the following the questions:

- Is the quantity of the chemical the facility is using or storing unusual?
- Has your facility identified the same major hazards as similar facilities?
- Does your facility have the same kinds of process controls as similar facilities?
- Does your facility use the same kind of mitigation systems as similar facilities?
- Do facilities in this industry generally have detection systems?

If the facility you are reviewing has not listed major hazards that similar facilities have identified, this may indicate a problem with the facility's hazard review or PHA. If it has fewer controls, mitigation systems, or detection systems than similar facilities have, you may want to talk to the facility about possible changes that could reduce risk.

If you ask local facility officials in advance, they may be willing to provide technical or other forms of assistance to help you understand accident prevention techniques in specific industries.

Once you have a list of other similar facilities, you can print out the RMPs or parts of the RMPs for these facilities and compare them to the RMP for your local facility. (This could even be a good research project for students at the local high school!)

You may be pleasantly surprised by the results of your work; you may find that your local facility is among the best in the nation.

On the other hand, if the local facility does not have certain process controls or a detection system typically used by similar facilities, or if it stores ten times as much of the regulated substance as anyone else, you have some solid information with which to start a dialogue on risk reduction.

In addition, keep in mind this is the first time that these types of data have ever been collected on a national basis. In some cases, local facilities may be very interested in what you find.

Based on the prevention programs of similar facilities in other parts of the country, local facilities may initiate state-of-the-art accident prevention practices.

Tips & Hints

You might set up a public recognition program to draw attention to local facilities that have especially good accident prevention programs.

A FEW MORE SUGGESTIONS

Now that you have an idea of how you can become involved in the Risk Management Program and accident prevention, you may have a few questions about how to proceed.

The following are suggestions to help you identify resources for information, funding, and legal issues.

Funding Your Activities

Some states and communities have appropriated general revenue funds for LEPC activities; others are relying on implementation fees and existing state agency budgets.

Because states have limited resources, each LEPC must find the means for achieving its goals. Some LEPCs will do their work with little funding. Your LEPC members may already be donating their time.

EPA's Chemical Emergency Preparedness and Prevention (CEPP) Technical Assistance Project Grants offer funding for state, local, and Tribal agencies for implementing the Risk Management Program and for developing the underlying support system.

Awards are made using the Clean Air Act Section 112(1)(4) and Section 103(b)(3) authorities. These authorities allow EPA to award grants related to the Risk Management Program directly to local governments.

The grantee must provide matching funds equal to 25 percent of the total project cost.

To obtain further information on the CEPP grants, contact CEPPO.

Tips & Hints

If you anticipate implementing the RMP regulation in your community, check EPA's Factsheet, "Funding Sources for Implementing the Risk Management Program", or the National Governors' Association December 1997 report, State Strategies and Considerations for Implementing the Chemical Accidental Release Prevention Program.

Liability

Some LEPCs and individual LEPC members have expressed concern that they might be held legally liable if they approve an emergency response plan that proves to be inadequate during an accident.

Check with your SERC about your state law and ask about liability considerations and protection.

Some LEPC members have asked whether they invite liability issues by reviewing facility RMPs. SERCs are generally considered state agencies and are, therefore, covered by the state's immunity provisions.

Some states have extended this immunity to LEPCs through laws or through legal decisions. Others have provided liability coverage for LEPCs.

LEPCs may also be able to address liability concerns by clearly stating (1) the limitations of any review they conduct of RMPs, and (2) that they neither have nor assume any legal obligations for reviewing RMPs.

Risk Management Program Resources	
Source of Information	**Location and Telephone Number**
My SERC	
My LEPC	
RMP Implementing Agency for my state	
EPA Regional Contact for EPCRA and RMP	
EPA's Chemical Emergency Preparedness and Prevention Office website	
The RCRA, Superfund and Toll free:	(800) 424-9346
Other hotlines	

Handy Reference

Using the table above, fill out the information that applies in your case, clip, and save for your use.

APPENDIX A: Checklist–Ideas for Action

- Visit EPA's chemical emergency preparedness and prevention website at http://www.epa.gov/ceppo. This site contains all the up-to-date information about both EPCRA and the RMP regulation, including electronic copies of relevant documents.
- Call the RCRA, Superfund and EPCRA Hotline at 1-800-424-9346 for answers to your questions and for help in getting copies of documents.
- Identify facilities. Use the list of regulated substances at the back of this booklet and your EPCRA section 312 reports (Tier II) to identify facilities that may be covered by the new RMP regulation. Remember, though, that EPCRA reports provide information on chemicals for the facility as a whole, while the RMP rule applies to a facility based on how much of a chemical it has in a single process.
- Contact these facilities and see if they want to work with you in sharing RMP information in your community.
- Arrange public information-sharing events with interested facilities.

Consider:

- Having special LEPC meetings for this purpose;
- Having local facilities host meetings that include the LEPC and members of the public; and
- Organizing an event at a shopping mall or auditorium at which several facilities can discuss their RMP information with interested local citizens.

- Work with facilities to: reduce chemical inventories; substitute less hazardous chemicals; use inherently safe technologies; and add new prevention measures.
- Develop a public recognition program to honor your firefighters, police department, and other first responders for their expertise in responding to hazmat incidents. Honor facilities who have a noteworthy accident prevention program. Honor volunteer groups like the Red Cross.
- Recruit effective LEPC members. Check to see if inactive members want to continue on the LEPC. If not, take this opportunity to recruit interested and effective new members. Check with your SERC and/or neighboring LEPCs for ideas about new members.
- Ensure a representative LEPC. Make sure your LEPC membership is broad-based and representative of your community.
- Leverage Resources. Organize your LEPC to use available resources such as students, retired chemical engineers, chemists, health professionals, and trade and volunteer organizations.
- Include small business representatives in your membership and invite them to meetings.
- Publicize the LEPC. Form a subcommittee with the assignment to make the LEPC better known in the community. Advertise your meetings in the newspapers and on TV and radio. Invite the news media to attend your meetings and report on them. Tell your citizens about the information you have about chemicals in the community.
- Educate the community. Form a subcommittee on public education and information to help the public understand chemical risks in the community, to respond to requests for information about chemicals in the community, and to involve the public in the emergency planning process as well as chemical accident prevention activities.
- Review this booklet's section on New Partnerships. Who in your community might be interested in the LEPC and its work?
- Review your current community response plan. How can it be improved using new RMP information?
- Coordinate plans. Ensure that your community response plan is coordinated with the emergency response programs of facilities in the community.
- Develop an up-to-date list of response and mitigation equipment in the community. Where is the equipment stored? The new RMP information should be of help to you on this task.

- Get training and technical assistance. Contact your SERC and/or your EPA regional office to find out about training and other sources of technical assistance in your area.
- Find the contact person. Contact your SERC and/or your EPA regional office to find out who will be the official implementing agency for the RMP program in your area as well as what RMP initiatives are underway in your state.
- Get a copy of EPA's Guidance for Implementing Agencies to learn how you can get more involved in the workings of the program. You may even decide to be the RMP implementing agency in your area.
- Obtain the Toxic Release Inventory (TRI) data for facilities in your area to ensure that you have all available information about chemicals in your community.

APPENDIX C: SOME BACKGROUND INFORMATION–COMPARISON OF GREEN BOOK AND RMP OFFSITE CONSEQUENCE ANALYSIS (OCA) GUIDANCE METHODOLOGY

Green Book	OCA Guidance
Purpose	
Help LEPCs conduct site-specific hazards analysis for airborne releases of extremely hazardous substances (EHSs) regulated under EPCRA section 302.	Help owners or operators of regulated sources to conduct offsite consequence analysis required under CAA section 112(r).
Chemicals Covered	
About 390 toxic gases, liquids, and solids. Chemicals listed based on toxicity alone; volatility not considered.	77 toxic gases and liquids and 63 flammable gases and volatile, flammable liquids. Toxic liquids (with a few exceptions) have vapor pressure at ambient temperature of at least 10 millimeters of mercury.
Endpoints	
Levels of concern (LOC) set for EHSs based on (1) one-tenth of the NIOSH IDLH or (2) one-tenth of an estimated IDLH based on mammalian toxicity data. **Use of endpoints:** Use of the LOC is not required - other endpoints are also suggested.	**Toxics:** Endpoints set by rule as (1) Emergency Response Planning Guideline Level 2 (ERPG-2) set by AIHA or (2) EHS LOC. Many endpoints are different from EHS LOCs. **Flammables:** Endpoints set by rule for blast overpressure from vapor cloud explosions, heat radiation from fires, and dispersion to the flammability limit. **Use of endpoints:** Specified endpoints must be used for consequence analysis.
Initial Screening (Green Book)/Worst-Case Releases (OCA Guidance)	
Quantity Released	
Maximum quantity that could be released from largest vessel or interconnected vessels.	Greatest quantity in a single vessel or in a pipe, considering administrative controls.
Release Rate For Toxic Gases	
Gases under ambient conditions: Substances that are gases under ambient conditions are assumed to be released over 10 minutes. **Liquefied refrigerated gases:** No provision for gases liquefied by refrigeration under ambient pressure. **Mitigation:** No method provided.	**Gases under ambient conditions:** Substances that are gases under ambient conditions and are handled as gases, as liquids under pressure, or refrigerated liquids that would form pools with a depth of 1 cm or less upon release are assumed to be released over 10 minutes. **Liquefied refrigerated gases:** Gases handled as refrigerated liquids at ambient pressure that would form pools with depth greater than 1 cm are treated as liquids. **Mitigation:** Method provided for reducing the release rate for gases released in enclosures.

For Toxic Liquids	
Liquid release: Assumed to be instantaneous. **Release to air:** Pool evaporation; equation for pool evaporation uses a mass transfer coefficient for water of 0.24 cm/sec. **Liquid density:** All liquids assumed to have the same density as water for estimation of pool size. **Solutions:** No method provided for solutions. **Mitigation:** Method provided for estimating release rate from diked area. No method provided for mitigation of release rate for liquids released in buildings **Temperature:** Factors provided for estimation of release rate at 25C and the boiling point.	**Liquid release**: Assumed to be instantaneous. **Release to air:** Pool evaporation; equation for pool evaporation uses a mass transfer coefficient for water of 0.67 cm/sec (i.e., evaporation rate increased by factor of about 3 over Green Book rate). **Liquid density:** Chemical-specific density factors provided for estimation of pool size. **Solutions:** Method and data provided for estimating release rates for common water solutions and oleum. **Mitigation:** Method provided for estimating release rate from diked area. Method provided for reducing the release rate for liquids released in buildings. **Temperature:** Factors provided for estimation of release rate at 25C and the boiling point. Factors generally significantly larger than Green Book factors because of revised mass transfer coefficient and revised chemical-specific data. Temperature correction factors provided for temperatures between 25 and 50C.
For Toxic Solids	
Solids with particle size 100 microns or less or solids in solution assumed released in 10 minutes; factors provided for release rate estimation for molten solids.	None regulated.
Flammable Substances	
Not covered.	Vapor cloud explosion of entire quantity assumed, with yield factor of 10%.
Meteorological Conditions	
F stability, wind speed 3.4 miles per hour (1.5 meters per second).	F stability, wind speed 1.5 meters per second.
Modeling Conducted	
Neutrally buoyant gases and vapors: Gaussian model used for neutrally buoyant plumes. • Continuous releases assumed, even for 10-minute releases. **Dense gases and vapors:** No dense gas modeling. (Note: The RMP Rule requires consideration of gas density for offsite consequence analysis)	**Neutrally buoyant gases and vapors:** Gaussian model used for neutrally buoyant plumes. • 10-minute releases; i.e., release assumed to stop after 10 minutes (with 10-minute averaging time). • 60-minute releases (with 30-minute averaging time). **Dense gases and vapors:** SLAB model used for dense gases. • 10-minute releases (with 10-minute averaging time). • 60-minute releases (with 30-minute averaging time). **Vapor cloud explosions:** TNT-equivalent model used for vapor cloud explosions.

Distance Tables Provided	
Neutrally buoyant plume table only: Rural conditions only for screening. Generally gives significantly greater distances for the same release rate and toxic endpoint than the OCA Guidance tables. (Note: The RMP Rule requires that rural or urban topography be used, as appropriate.)	**Toxics:** Neutrally buoyant plume tables: • Rural - 10 minute and 60 minute. • Urban - 10 minute and 60 minute. **Dense gas tables:** • Rural - 10 minute and 60 minute. • Urban - 10 minute and 60 minute. **Chemical-specific tables:** • Ammonia liquefied under pressure. • Ammonia solution. • Chlorine. • Sulfur dioxide. **Flammables:** Vapor cloud explosion distance table.
Maximum Distance in Tables	
10 miles	25 miles
Reevaluation (Green Book)/Alternative Scenario Analysis (OCA Guidance)	
Quantity Released	
Estimate quantity based on site-specific information.	Estimate quantity based on site-specific information.
Release Rate For Toxic Gases	
Estimate release rate based on site-specific information. Specific methods not provided. **Mitigation:** No method provided.	**Gases under pressure:** Estimation methods for: • Gaseous release from tank (based on hole size and tank pressure. • Gaseous release from pipe. • Release of gas liquefied under pressure: o from vapor space, o from liquid space. **Liquefied refrigerated gases:** Gases handled as refrigerated liquids at ambient pressure are treated as liquids. **Mitigation:** Method provided for reducing the release rate for gases released in enclosures. Active mitigation measures also discussed.
For Toxic Liquids	
Liquid release: Estimate release rate based on site-specific information. **Liquid density:** Not considered. **Solutions:** No method provided for solutions. **Release to air:** Pool evaporation, as for screening **Mitigation:** Same as for screening. **Temperature:** Same as for screening.	**Liquid release:** Estimation methods for: • Release from tank under atmospheric pressure. • Release from pressurized tank. • Release from pipe. **Liquid density:** Considered as for worst case. **Solutions:** Considered as for worst case. **Release to air:** Pool evaporation, as for worst case **Mitigation:** Same methods for passive mitigation as for worst case. Active mitigation for liquid release and for release to air discussed. **Temperature:** Same as for worst case.

For Toxic Solids	
Estimate release rate based on site-specific information.	None regulated.
Flammable Substances	
Not covered	Methods provided for: • Vapor cloud fires. • Pool fires. • BLEVEs. • Vapor cloud explosions, based on less conservative assumptions than the worst case.
Meteorological Conditions	
D stability, wind speed 11.9 miles per hour (5.3 meters per second) or same conditions as for screening.	D stability, wind speed 3 meters per second.
Distance Tables Provided	
Neutrally buoyant plume tables only: Rural (screening conditions and D stability, higher wind speed). Urban (screening conditions and D stability, higher wind speed).	**Toxics:** Neutrally buoyant plume tables: • Rural - 10 minute and 60 minute. • Urban - 10 minute and 60 minute. Dense gases: • Rural - 10 minute and 60 minute. • Urban - 10 minute and 60 minute. Chemical-specific tables: • Ammonia liquefied under pressure. • Ammonia solution. • Chlorine. • Sulfur dioxide. **Flammables:** Vapor cloud explosion distance table. Vapor cloud fire distance tables: • Neutrally buoyant plumes. • Dense gases. BLEVE (fireball) distance table.
Maximum Distance in Tables	
10 miles	25 miles

CLEAN AIR ACT SECTION 112(r): ACCIDENTAL RELEASE PREVENTION/ RISK MANAGEMENT PLAN RULE

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When Congress passed the Clean Air Act Amendments of 1990, Section 112r required EPA to publish regulations and guidance for chemical accident prevention at facilities using substances that posed the greatest risk of harm from accidental releases. These regulations were built upon existing industry codes and standards (available at: www.epa.gov/emergencies/lawsregs.htm#fraccident) and require companies of all sizes that use certain listed regulated flammable and toxic substances to develop a Risk Management Program, which includes a(n):

- Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases scenarios;
- Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and
- Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g., the fire department) should an accident occur.

By June 21, 1999, a summary of the facility's risk management program (known as a "Risk Management Plan" or "RMP") was to be submitted to EPA. At the end of 2008, EPA had RMPs from about 14,000 facilities. The plans must be revised and resubmitted every five years. There are other circumstances described in the RMP regulations, however, which may require a more frequent submission. New facilities must submit a completed RMP as soon as they have a covered chemical above the threshold quantity.

The Risk Management Program is about reducing chemical risk at the local level. The RMP information helps local fire, police, and emergency response personnel (who must prepare for and respond to chemical accidents), and is useful to citizens in understanding the chemical hazards in communities.

WHO IS COVERED BY THE RMP REGULATIONS?

Owners and operators of a facility (stationary source) that manufactures, uses, stores, or otherwise handles more than a threshold quantity of a listed regulated substance in a process, must implement a risk management program and submit a single RMP for all covered processes at the facility. “Process” means any activity involving a listed regulated substance, including any use, storage, manufacturing, handling, or onsite movement of such substances, or combination of these activities. The regulations do not apply to transportation, including storage incident to transportation. However, transportation containers used for storage not incident to transportation and transportation containers connected to equipment at a stationary source are considered part of the stationary source, and are potentially covered by the regulations. See the General Guidance on Risk Management Program for Chemical Accident Prevention (40 CFR Part 68) at: http://www.epa.gov/emergencies/docs/chem/Toc-final.pdf for more information on regulatory coverage.

WHAT CHEMICALS ARE COVERED?

The regulation includes a List of Regulated Substances under section 112(r) of the Clean Air Act, including their synonyms and threshold quantities (in pounds) to help assess if a process is subject to the Part 68 rule or the general duty clause. A link to EPA’s list of regulated substances and their threshold quantities can be found at: http://www.epa.gov/emergencies/content/rmp/index.htm. The regulated substances are listed in four tables, two listing the regulated toxic substances (alphabetically and by CAS number) and two listing the regulated flammable substances (alphabetically and by CAS number). States who have taken delegation of the Clean Air Act, Section 112(r) program may have additional requirements for the federally listed chemicals, and/or additional listed chemicals.

(NOTE: Listed flammable substances used as fuel or held for sale as fuel at a retail facility are not covered by the Part 68 regulations. However, flammable substances used for some other purpose, such as a chemical feedstock or when held for sale as fuel at a wholesale facility are covered by the regulations.) The threshold quantities for toxics range from 500 to 20,000 pounds. For all listed flammables, the threshold quantity is 10,000 pounds.

WHAT ARE “PROGRAM LEVELS”?

An underlying principle of the regulations is that “one size does not fit all.” EPA has classified processes into three Programs to ensure that individual processes are subject to requirements that appropriately match their size and the risks they pose. As a result, different facilities covered by the regulations may have different requirements depending on their processes.

Program Level 1 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes that would not affect the public in the situation of a worst-case release (in the language of Part 68, processes “with no public receptors within the distance to an endpoint from a worst-case release") and with no accidents with specific offsite consequences within the past five years. Program 1 imposes limited hazard assessment requirements and minimal accident prevention and emergency response requirements.

Program Level 2 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes not eligible for Program 1 or subject to Program 3. Program 2 imposes streamlined accident prevention program requirements, as well as additional hazard assessment, management, and emergency response requirements.

Program Level 3 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes not eligible for Program 1 and either subject to OSHA's Process Safety Management (PSM) standard under federal or state OSHA programs or classified in one of ten specified North American Industrial Classification System (NAICS) codes. Program 3 imposes OSHA's PSM standard as the accident prevention program as well as additional hazard assessment, management, and emergency response requirements.

Based on their limited potential for serious offsite consequences, facilities are not required to implement a prevention program, an emergency response program, or a management system for Program 1 processes. Facilities with processes in Program 2 and Program 3 must address each of the three RMP elements described above for those processes. For more detailed information, consult the General Guidance on Risk Management Programs for Chemical Accident Prevention (40 CFR Part 68) or one of the industry-specific guidance documents available at:

Office of Emergency Management

http://www.epa.gov/emergencies/guidance.htm for an explanation of what is involved for each of the RMP elements.

WHERE DO YOU GO FOR MORE INFORMATION?

Visit the Risk Management Program Web site at: http://www.epa.gov/emergencies/rmp for current information and sign up for the listserv to receive periodic updates.

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REVISIONS TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION HAZARD COMMUNICATION STANDARD (HCS)

On March 26, 2012, Occupational Safety and Health Administration (OSHA) modified its Hazard Communication Standard (HCS) to conform to the United Nations' (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

The revisions will improve consistency and quality of information that is provided to both employers and employees concerning chemical hazards and protective measures related to chemical hazards.

What is the Globally Harmonized System of Classification and Labeling of Chemicals?

GHS is a system developed by the UN to strengthen international efforts concerning the environmentally sound management of chemicals. It was recognized that an internationally harmonized approach to classification and labeling would provide the foundation for all countries to develop comprehensive national programs to ensure the safe use of chemicals.

GHS establishes a set of criteria and provisions that regulatory authorities, such as OSHA, can incorporate into their existing regulations or standards, or use to develop a new system. Regulatory authorities are not required to adopt all of the criteria that are defined in GHS, only those that are appropriate to their specific regulations.

GHS includes harmonized provisions for classification of chemicals for their health, physical and environmental effects, as well as for labels on containers and safety data sheets (SDSs, formerly "Material Safety Data Sheets, or MSDSs). The definitions of hazards in GHS are more specific and detailed than in HCS prior to the adoption of GHS provisions.

Under the GHS, each hazard (e.g., explosives, carcinogenicity) is considered to be a hazard class. The classes are sub-divided into categories of hazard.

For example, carcinogenicity has two hazard categories; category one is for known or presumed human carcinogens while category two is for suspected human carcinogens. GHS provisions require manufacturers and importers to classify their chemicals using these specific criteria.

GHS provisions also require manufacturers and importers to classify mixtures using a tiered approach. GHS specifies using pictograms and precautionary statements on container labels. GHS also establishes a standardized 16-section format for SDSs to provide consistent sequence of information for users.

HCS Prior to Adopting GHS Provisions

HCS was first promulgated in 1983 and it required chemical manufacturers and importers to evaluate hazards of the chemicals they produce or import and transmit this information on container labels and MSDSs to downstream users of the chemicals.

HCS also required employers to train employees who are exposed to hazardous chemicals and provide them access to MSDSs.

The standard was performance-oriented, providing definitions of hazards and parameters for evaluating the evidence to determine whether a chemical is hazardous. The evaluation is based upon evidence that is currently available and no testing of chemicals is required. HCS established requirements for minimum information that must be included on labels and MSDSs, but did not provide specific language to convey the information or a specific format in which to provide it.

Some chemical manufacturers and importers followed a specified format for MSDSs developed under a voluntary consensus standard (ANSI Z400.1), which was later adopted by GHS with minor changes.

Summary of Changes to the HCS

- **Hazard Classification**: Chemical manufacturers and importers are required to re-evaluate chemicals according to the new criteria adopted from GHS in order to ensure that pure chemicals and mixtures are classified appropriately. The new criteria must be provided to downstream users in revised SDSs.
- **Labels**: Chemical manufacturers and importers must provide a label which includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.
- **Safety Data Sheets**: The new format contains 16 specific sections with headings for each section, which ensures consistency in presentation of information. Chemical manufacturers and importers are required to distribute modified safety data sheets to downstream users of their chemicals.
- **Information and training**: To facilitate understanding of the new system, the standard requires that workers be trained on the new label elements and safety data sheet format.

Effective Dates for Provisions in HCS:		
Effective Completion Date	**Requirement(s)**	**Who**
December 1, 2013	Train employees on the new label elements and SDS format.	Employers
June 1, 2015 December 1, 2015	Comply with all modified provisions for preparation of new labels and safety data sheets, except: Distributors shall not ship containers labeled by the chemical manufacturer or importer unless it is a GHS label.	Chemical manufacturers, importers, distributors and employers
June 1, 2016	Update alternative workplace labeling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.	Employers
Transition Period (May 25, 2012 to the effective completion dates noted above)	Comply with either the revised HCS published on March 26, 2012 or the standard that were in effect prior to adopting GHS provisions.	All chemical manufacturers, importers, distributors and employers

How do changes to HCS affect Sections 311 and 312 of the Emergency Planning and Community Right-to-Know Act (EPCRA)?

Certain provisions of EPCRA sections 311 and 312 and the implementing regulations may be affected due to the revisions in HCS, mainly the requirement for submitting material safety data sheet (MSDS) under section 311. The reporting requirements under EPCRA section 311(a) and its implementing regulations codified in 40 CFR part 370 apply to the owner and operator of a facility required to prepare or have available an MSDS under OSHA HCS for any hazardous chemical. The owner or operator of the facility must submit the MSDS or a list containing all hazardous chemicals to their State Emergency Response Commission (SERC), local emergency planning committee (LEPC) and the local fire department if the reporting thresholds specified in 40 CFR part 370 are met. Section 311(d)(2) of EPCRA requires an owner or operator to submit a revised MSDS to the SERC, LEPC and the local fire department within 3 months of finding significant new information about the hazardous chemical for which an MSDS was previously submitted.

However, states were always given the flexibility to implement EPCRA as needed to meet the goals of EPCRA in their communities. Each state may have specific requirements for submitting information under sections 311 and 312, including electronic reporting. Facilities are encouraged to contact their states regarding the submission of revised SDSs.

Where Do I Go For More Information?

For more information on hazard communication standards, including the link to the final rule published in the Federal Register on March 26, 2012, please visit OSHA's hazard communication safety and health topics page: http://www.osha.gov/dsg/hazcom/index2.html.

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MAKING IT WORK: SECRETS OF SUCCESSFUL SERCs

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What's Inside…

Even though the Emergency Planning and Community Right-to-Know Act (commonly known as Tide III) is a federal law the real job of making it work takes place most often the state and local level. Citizens' groups, local emergency responders, business people, and government officials all play a critical part in reducing the risk from chemicals in the community. Because all these groups don't always have the chance to talk directly to one another, EPA publishes the *Making It Work* bulletins as a forum for people in the Title III community to trade ideas and exchange information. (For more detailed discussion of some of the state activities mentioned in this publication, see the "Successful Practices in Title III Implementation series of bulletins.)

In this issue, a number of State Emergency Response Commissions (SERCs) share their "secrets" about what makes a Title III program work at the state level:

- Having written by-laws that clearly establish procedures and responsibilities;
- Delegating jobs and authority to all SERC members;
- Managing and using Title III information in creative ways;
- Providing assistance to LEPCs;
- Finding a variety of sources of funding: and
- Being proactive rather than just following the letter of the law.

As it turns out, there's very little secret about most of these practices - the most important factors in creating an effective state Title III program are energy, creativity, dedication, and leadership.

Put It In Writing

Written by-laws can make the difference between organization and chaos.

The 1986 Emergency Planning and Community Right-to-Know Act outlined the basics of what a SERC is and what it's supposed to do: collect and distribute Title III data, establish Local Emergency Planning Committees (LEPCs) and supervise their activities, and review local emergency plans.

Beyond these broad guidelines, though, the law left many of the specifics of carrying out Title III to the individual states.

That gives each SERC the freedom to tailor its program to fit the state's own particular needs. For example, a densely populated industrial state with many chemical facilities and a great deal of rail and highway transport of hazardous materials may want to set up a different program than a rural state.

However the program is structured, it's important to have the duties and authority of the SERC clearly spelled out, either through state legislation, an executive order from the governor, or some other formal means.

It may seem like yet another burden of paperwork, but the alternative can be a muddle of confusion over who's responsible for what.

Before Maine enacted its own state right-to-know law in 1989, many issues came up that were difficult to settle among all the groups involved in emergency response, says David Brown of the Maine SERC.

The process of writing a state law helped to focus the debate and establish clear and orderly procedures.

The first order of business was to copy and codify the requirements of the federal Title Ill into the state law, says Brown.

"We found that this was very important in order to make compliance easier and to make things easier to understand," so that people wouldn't have to run to the federal documents whenever a question came up.

'Then we added the specifics that would be unique for Maine," says Brown. For example, the state law mandated that facilities develop emergency plans and conduct annual exercises, and that an environmental group be included on the SERC and on each of Maine's 16 LEPCs.

It set term limits for non-permanent SERC members, with expiration dates staggered so that new members are folded in gradually.

An important part of writing by-laws for a SERC is to establish who's in charge. "It's absolutely necessary" to have a designated lead agency, says Brown. "If that position of leadership is abdicated, then the splinter groups will go off in ten different directions."

In Maine, as in many states, the SERC is headed by the state emergency management agency, but the responsibilities of other agencies – environmental protection, police, etc. - also were spelled out clearly either in the statute or in an executive order from the Governor that "fleshed out the little details," according to Brown.

Rules governing each agency's participation in the SERC should specify positions, not individuals, so that when key people leave, their replacements will know what their roles and duties are.

In Maine, the commissioner of the department of public safety is required by executive order to name a state police person to sit on the SERC.

But if that person can't make a meeting, the commissioner is responsible for making sum that someone else does attend. That way, the SERC is never without a quorum.

After Maine passed its state right-to-know law, the SERC then produced a "plain English" primer that put the new law into ordinary language so that LEPCs, facilities, firefighters, and other groups would be even more clear about what was required of them.

As a result, says Brown, "We've moved from feeling our way around in the dark to a situation where most of the LEPCs have conducted at least one exercise, most facilities have submitted an emergency plan for review, and 95 percent of our facilities that have hazardous materials are now registered with us."

Delegate!

The lead agency shouldn't do everything. That's what the SERC is for.

Along with money, the resource that every state Title III program needs most desperately is manpower. Effective SERCs have learned to spread the workload around to as many people as possible so that the lead agency - the agency responsible for administering the state's Title III program doesn't become overburdened.

"Delegation is the first logical step," says Delaware SERC representative Gordon Henderson. "You sure as heck don't want to set up a bureaucracy, even if you did have the money."

It starts with using the resources that are already on hand, beginning with the other state agencies represented on the SERC. When Title III passed in 1986, there was no additional money provided to perform its functions, says Henderson, so Delaware divided the new responsibilities among agencies that already were doing similar jobs.

The state EPA, for example, had been handling chemical release notifications from facilities, so it took on Title III's additional requirements.

The public health department expanded its collection of worker-right-to-know information to include reports required under sections 311 and 312.

Once the jobs are delegated, it's important for the lead agency to coordinate all the efforts into a single coherent program.

Agencies working on chemical emergency planning, for example, should be aware of who is collecting TRI (Toxic Release Inventory) data collected under section 313, which may be of value to them.

Similarly, state agencies that handle risk assessment, clean air, transportation, and other programs related to Title III should be encouraged to join the SERC and add whatever help and resources they can.

This is particularly important since the 1990 passage of two new laws that could affect SERC activities significantly - the Clean Air Act Amendments (CAAA) and the Hazardous Materials Transportation Uniform Safety Act (HMTUSA).

Participation in the SERC isn't limited to government agencies, however. Each state should aim to create a balanced and active commission that represents all sectors of the community, then make sure that each of the members takes an active role.

"We are demanding of our SERC members," says Ohio SERC chairman Grant Wilkinson. "If they miss two meetings in a row and don't have a good reason for it, we remove them from the commission."

Wilkinson also encourages lots of interaction in SERC meetings, not only among commission members but with the audience as well: "I don't generally let someone sit there without saying something."

As a result, he says, Ohio's SERC meetings have been well-attended and productive.

"This has to be a dynamic process if it's going to work," says Joe Quinn of the Nevada SERC. "New members should be brought in regularly - new blood, if you will."

In Nevada, transportation of hazardous chemicals has become more of an issue recently, so representatives from railroads and the trucking industry are being introduced into the SERC.

One key "player" on any SERC has to be local industry, says Quinn. "The public sector cannot set itself up in automatic opposition to the private sector - it's got to be a partnership."

The Nevada SERC has been very successful in getting real participation from its industrial members: a chemist from a local mine might give a training course, or a facility might donate use of its vehicles to haul equipment.

The companies are generally happy to help, says Quinn. 'The PR doesn't hurt them at all, and it's of mutual benefit. They live here, too. Their kids go to the same schools."

Including state political figures as active members of the SERC also is "critical," says Quinn. "Without that conduit to the legislative body of the state, the SERC is not going to be anywhere near as effective as it should be. If it works correctly, [the SERC] can be a tremendous force in getting needed legislation passed."

As the numbers of people involved in Title III issues grow, the SERC membership could become unwieldy.

To avoid this, it may be helpful to create committees and working groups for ongoing jobs that require more attention.

What the Law Says about SERCs

According to section 301 of the Emergency Planning and Community Right-to-Know Act (EPCRA) - also known as Title III - each State Emergency Response Commission (SERC) is required to:

- "...designate emergency planning districts in order to facilitate preparation and implementation of emergency plans."
- "...appoint local emergency planning committees [LEPCs] members...and supervise and coordinate the activities of such committees..."
- "...review the the [LEPC] plan and make recommendations to the committee... necessary to ensure coordination of such plans with...plans of other [LEPCs]..."
- "...notify the Administrator of facilities subject to...[section 302]...by notifying the Administrator of:
    - each notification received from a facility under subsection (c) and,
    - each facility designated by the Governor or State emergency response commission..."
- "...establish procedures for receiving and processing requests from the public for information...;" and
- "Upon receipt of a request for tier-II information... (from a state or local official)...request the facility owner or operator for the tier II information and make available such information to the official."

The Maine SERC has three standing committees for dealing with training, budget, and community right-to-know issues. There are 25 members on the training committee alone, including fire fighters, police, medical emergency responders, and industry representatives.

Because all these groups have their different perspectives on emergency response, the committee hashes out whatever disagreements might arise over policies and plans before making a recommendation to the overall SERC for approval or disapproval.

Short-term projects can he delegated to subcommittees. It formed an LEPC Advisory Task Force to develop a guidance manual giving LEPCs a basic overview of Title III requirements, along with sample emergency plans and public notices.

With half its members drawn from industry and half from LEPCs, the task force was able to tackle a job that the SERC would have been unable to take on itself.

Advisory committees are another way to get much-needed help while at the same time broadening the base of support for Title III programs within the state.

R. C. Dawson serves on a hazmat response advisory committee in Virginia, one of several such groups that provide advice to the SERC in a specific area where it can use more expertise.

Some advisory committees meet monthly, others less often, depending on the tasks at hand. The hazmat advisory committee involves police, firefighters, rescue officials, and others "from a variety of disciplines," says Dawson. "Once you break down the barriers and start networking, you open up a whole avenue of help."

In Ohio, a task force set up by the state legislature to conduct a one-time outside review of the SERC's activities has been helpful as a kind of reality check, says SERC chairman Grant Wilkinson.

With its membership drawn from the regulated community, LEPCs, and environmental groups - no state employees allowed - the task force can assess how effectively the SERC is fulfilling its charter and recommend how its operations might be improved.

Then, after the group makes its report, it simply disbands instead of leaving behind another permanent layer of bureaucracy.

When looking for resources to draw into the SERC, it's useful to think regionally.

Many chemical safety issues extend across state lines and even international borders. Neighboring SERCs, the federal Regional Response Team, and EPA's regional office all can be of help.

It may be a simple matter of two counties on opposite sides of a state line conducting joint safety exercises. Or it may involve cooperation on a larger scale. In Delaware, a recent LEPC regional conference drew 275 people from 13 states who were able to share ideas about solving common problems.

As with most Title III work, regional cooperation depends on people in different organizations in different states talking to each other and exchanging information about their programs.

"The job title I have of Title III 'coordinator' is pretty descriptive," says Delaware's Gordon Henderson. "What I do all day long is coordinate. I'll be on the phone to FEMA, to EPA's regional office or headquarters, to my counterpart in another state, or to one of our LEPCs. You pick up the telephone and you talk to a lot of people."

As SERCs delegate work to more and more "helpers," the issue of legal immunity may eventually arise. Volunteers who participate on LEPCs and SERCs may become concerned that they are legally liable if an accident occurs in a facility for which they've helped to create an emergency response plan.

In order to allay these fears, states such as Arizona have passed laws that specifically grant immunity to SERC and LEPC members.

Most states have some form of liability protection for individuals involved in emergency planning, or have existing laws that cover volunteers in general. In any case, the SERC may want to address this issue as it seeks to recruit people willing to carry out the work of Title III.

Information

Collecting a mountain of data isn't your goal - understanding and using it is.

A large part of Title III work is collecting information – about facilities, about the chemicals they handle, and about the risks these chemicals pose to the community. Managing that flood of information, and using it in creative ways, is one of the great challenges facing any SERC.

The first concern should be who's going to collect the data. Tier II forms, Form R reports, Material Safety Data Sheets, and other Title III data can all go to the same state agency or to several different ones. But if the information is scattered, it should eventually be put into a format compatible with different uses, or integrated into a single database that contains all Title III information in a form that everyone can use.

Pennsylvania made the decision that one-stop shopping was the best way to go, says SERC representative Jim Tinney. One agency collects all Title III information, assembles it into a statewide computer database, then sends the updated data twice a year to LEPCs, who can plug the latest information into dBase, CAMEO (Computer-Aided Management of Emergency Operations), or other computer programs of their choice. That way, says Tinney, instead of having the data exist in different forms all over the state, "We all have up-to-date files."

One way for SERCs to get the most out of Title III data is to make LEPCs familiar with the latest computer database programs. "Information is power," says Karl Bims of the Kansas SERC, "and one way to empower the LEPCs is to support a system that gets them usable information."

The Kansas SERC makes CAMEO software - which includes databases on chemicals, facilities, and transportation, along with street maps to assist planning and response personnel – widely available to counties. The SERC provides the CAMEO software to any LEPC that wants it, along with maps and local Title III data. Once it's up and running, the CAMEO database includes "names of the companies, contacts, what chemicals are present, where they're found, everything," says Bims."CAMEO is a real live link to information It's the kind of thing that takes the program out of the theoretical and makes it practical."

Aside from helping LEPCs with their emergency planning, these kinds of powerful computer programs allow the LEPC to establish "linkages" with other agencies outside the chemical safety community, says Birns. CAMEO can be useful to officials responsible for zoning and highway planning, or to health departments who can use it to track private wells and septic systems. Bims suggests that counties make CAMEO data available to road departments, water departments, and many other users so that the LEPC becomes a respected source of information.

This empowerment, he says, is probably the single most important thing a SERC can do for LEPCs. "If the LEPC is in a position to be a source of good information to everybody, then they become a formidable force in their community, and they will accrue support. People will come to them."

The ultimate goal of community "right-to-know" laws is to get the information out to the general public, and here too, the SERC can take an active role. The first thing the Pennsylvania SERC did in this regard was to establish a citizens' reading room where the public could come in and review submitted Title III forms on paper. When computer automation became more widespread and affordable, the reading mom substituted a laser-disc "Citizen's Access Workstation" for the paper files. With only a little bit of instruction, users from the general public can create their own queries and get copies of Title III reports.

People visit the reading room and make written requests, says Tinney, or "they call us on the phone, and we provide customized responses." In order to let the public know that the service is available, the SERC sends out press releases and does an annual mailing to every employer in the state.

Other Title III outreach activities in Pennsylvania include seminars for trade groups and citizens' associations, exhibits at environmental conferences, and an electronic bulletin board carrying general information about Title III that's accessible to anyone with a computer modem.

Currently, says Tinney, the Pennsylvania SERC is working with a fire company and a private vendor to develop a way for remote users to dial directly into the state's Title III data system. Using touch-tone voice prompts, he says, "You could, in effect, order up your own fax of a site plan or a Tier II or TRI form." The system is being designed initially for emergency responders, but ultimately, he says, it could be made available to the public.

This movement to convert Title III data to more "user-friendly" formats also is underway in Hawaii, where the SERC is using grant money from EPA to install computer displays in public places such as libraries. The system would use hands-on, interactive video displays to present basic information about chemicals in the community.

In Minnesota, the SERC found that it was routinely asked for information about Title III by citizens' groups around the state. But, says SERC representative Bob Dahm, "What can you do with a bunch of handouts and a six-foot table?"

So, using grant money from EPA, the Minnesota SERC developed a portable display booth - complete with photo panels explaining how facilities use chemicals and what Title III is all about - that could be used as a traveling exhibit. Along with the booth, the SERC produced a video and printed booklets that could be handed out to the public.

The first stop on the "tour." says Dahm, was the Minnesota State Fair. After that, the booth traveled to meetings of fire chiefs, Environmental conferences, citizens' groups - "anywhere we found a large enough audience." The SERC also has made the booth available to any county that wants to display it in shopping malls or other public forums.

Minnesota's other outreach efforts include developing a speaker's kit for people giving talks to citizens groups and producing public service announcements that have aired on local radio stations. Interestingly, the SERC found that television commercials were not the best way to spread the word. “We were told by stations, ‘We’ll air [a public service announcement], but it will be somewhere between the 53rd episode of I Love Lucy and the Home Shopping Channel,’ ” says Dahm. “‘For the cost of producing something like that, we decided it wouldn’t be money well spent.”

LEPCs: How You Can Help

The local level is where most of the work is - and should be - done.

If SERCs often find themselves strapped for resources, the situation can be even worse at the local level. Because LEPCs often receive very little direct financial support, says Delaware’s Gordon Henderson, “You start having LEPCs run on sort of a bake-sale basis, scrounging for filing cabinets or Xerox machines.” The result, he says, is that “A lot of them were feeling alienated, saying, ‘We’re the ones who have the liability if the plant fails, but nobody’s talking to us.”

There are a number of ways a SERC can help. One way is to help LEPCs get organized by giving them guidance on writing their own bylaws. What’s true for states also is true at the local level: Without written rules, the implementation of Title III can dissolve into chaos.

Bringing Neighbors Together

One LEPC has a problem. Another has the solution. The trouble is, they’re on opposite sides of the state and neither one is aware of what the other is doing.

That’s where the ”peer-exchange” grant program sponsored by EPA and the International City Management Association (ICMA) comes in. LEPCs can apply to the program to serve either as “advisors” or “recipients” of assistance. At the ICMA offices in Washington, D.C., the applications are entered into a database that matches LEPCs who have specific needs with those who offer that same expertise. The two parties get together for a workshop, compare notes and both go home a little wiser. The grants cover up to $600 of travel costs and other basic expenses for workshop attendees.

ICMA expects to award approximately 30 of these peer exchange grants in 1992.

The Arizona SERC discovered a simple way to be of assistance in this area. After one county in the state, Cochise, produced a good, workable set of by-laws - covering everything from where the LEPC office was located to who was responsible for public information – the SERC merely sent the Cochise by-laws around to each of the other 15 Arizona LEPCs as a model to copy or adapt to their own needs.

“Why reinvent the wheel?” says Carl Funk of the Arizona SERC. Since then, half of the state’s LEPCs have adopted their own bylaws.

SERCs can help LEPCs in other ways, by running public information campaigns to draw volunteers, or by providing general guidance and relevant documents on state and federal Title III requirements.

By law each SERC also is requited to conduct regular reviews of LEPC emergency plans. Here the SERC’s oversight can be of immeasurable help in making sure that local communities are building an effective Title III program.

Virginia is a good example of a state that “takes care” of its LEPCs by offering expert guidance on emergency planning. A branch within the state’s emergency management agency takes responsibility for helping LEPCs to develop their emergency plans. The branch reviews the plans, sends them back with recommendations, and conducts training courses to help LEPCs solve their problems if the plans don’t meet certain criteria. These courses are often group sessions where several LEPCs that have similar problems can compare notes. After the group session, a state representative follows up to address the individual issues in each jurisdiction.

The other important supervisory role that SERCs have is to provide guidance in creating training programs. Here again, Virginia offers an extensive program. Each year, the SERC puts on two to three contingency planning courses, along with two emergency exercise design courses, at least two conferences for public officials (which may include LEPC members), and 60 to 70 courses for hazardous materials responders. The courses are free to all attendees and are offered at different locations around the state - because, says SERC representative Norman McTague, “It’s a heck of a lot easier to get people to drive 100 miles than 200 or 300 miles.”

As part of its LEPC outreach program, Virginia (through a grant from EPA) also has aired a full-day satellite TV program on Title III emergency planning, complete with call-in from the LEPCs. The emergency management agency also keeps four people “in the field” to help support the 114 LEPCs in the state. As a result, says McTague, “We keep in fairly close contact all the time.”

When the SERC can’t go to the LEPCs, the LEPCs can come to the SERC. One simple way is to hold statewide meetings so that people from different jurisdictions can share ideas. Often, says Sue Vaughn of the Connecticut SERC, ‘There’s no other mechanism for LEPC members to get together and exchange ideas.”

Michigan has had great success with its annual LEPC conference, says SERC representative Diane Ogren. With 97 LEPCs in the state, the conference draws an attendance of some 250 people each year, who hear presentations and trade information. “We don’t just invite LEPC members,” says Ogren. “We also invite members of hazardous materials response teams, so the planners and the responders get a chance to interact." Carl Funk of Arizona agrees that the rejuvenation that takes place at these statewide meetings justifies paying travel expenses for LEPC members to be there. It's a good way, he says, of "maintaining constant contact."

SERCs also can encourage neighboring LEPCs to share emergency equipment and other resources through mutual aid agreements. The Minnesota SERC currently is putting together a database of emergency response personnel, equipment, and supplies that could be made available to all local governments within the state. The information would go into a database tended by a 24-hour duty officer. That way, says Bob Dahm, "When someone calls and says they need [emergency equipment] in a hurry, you call the duty officer and he pulls up the list of sources."

Cooperative agreements across political boundaries also extend to Minnesota's dealings with Indian reservations, which are sovereign nations. The state has a Memorandum of Understanding with the Minnesota Chippewa Tribe whereby the tribe works in cooperation with the SERC, sharing planning, training, and response resources as well as facility information.

Mutual aid agreements are just a matter of common sense, says Joe Quinn of the state of Nevada, which has set up "Project Oasis" to integrate information about regional resources and response capabilities into a single comprehensive computer database. 'There's no way some rural districts can support a hazmat team of their own," says Quinn, "whereas if the resources are focused, a regional team is a much more logical approach to the problem - and a lot more economically feasible."

Paying the bills

Money is always a problem, but for most SERCs there's more than one source of revenue.

No Title III program can run without funding, of course, and the perpetual battle to raise money preoccupies many a SERC chairperson.

Most states appropriate some amount of public funds in their annual budget for Title III programs.

Another option is to do what many states already have done: establish fees for industry who file reports under Title III. Maine, for example, established a fee system based on the amount of hazardous chemicals stored at each facility (with a ceiling of $5,000 per facility per year). Not only does that raise revenue, it also discourages facilities from storing large amounts. According to the 1991 edition of the National Governors Association's publication, Emergency Planning and Community Right-to-Know: A Status of State Actions, 18 states have Title III fee systems in place, while two others have fee programs that provide funds to support Title III activities. Ten other states plan to introduce fee bills during their 1992 legislative sessions.

Be warned, however: if you don't already have a fee system, getting the legislation through the statehouse may be a long process. In Delaware it took three years to agree on a bill that wasn't considered too burdensome on industry. 'That wasn't easy legislation to draft," says Gordon Henderson. "I remember spending an hour and a half one day on the committee just trying to say 'gas station' in legal language."

The key to success, he says, is to get industry actively involved in the process of creating a fee system from the start, instead of springing it on the facilities without their participation.

"You have to work with the community that you're regulating," Henderson says. "Industry wanted something that would work. Better to have a good, workable system that [they] helped to develop than to let a bunch of bureaucrats do it."

Before establishing its fee system, the Delaware SERC set up a subcommittee with Kansas members from industry, fire fighters, and state representatives (who head two of the state's LEPCs). The subcommittee worked out several compromises, including exemptions for non-profit associations. But even if there are compromises, the result can be thousands of additional dollars coming to the SERC every year, and a way to decrease its reliance on general appropriations.

In some states, money from fees or appropriations are passed through directly to LEPCs. In others, the SERC itself administers the funds, which can be a good way of keeping abreast of local activities.

To qualify for grants, Wisconsin LEPCs have to be able to show that they did a certain amount of work, says William Clare of the Wisconsin SERC. 'They don't automatically get the grant whether they do something or not." The SERC uses a formula based on population and the number of planning and reporting facilities to determine grants that cover each LEPC's planning and administrative costs. Grants also can provide matching funds for computer equipment and emergency response equipment. Along with their grant application, however, the LEPC is required to fill out a work plan detailing its planned activities in developing emergency response plans, conducting emergency exercises, and meeting other requirements of Title III. If any of these milestones am not met, a percentage of the total grant is deducted for each task the LEPC has not completed. That way, says Clare, funding is tied to performance, and the state gets the best possible result from its appropriated money.

Civil action settlements and fines for noncompliance can be another source of revenue. Although "We've discovered that encouragement works a lot better," says David Brown of the Maine SERC, "We'll still do it [enforcement]. We're not going to ignore violators."

Even when it isn't mandatory, facilities in the state can be an important source of financial help. "One of the things we found [in Delaware] is that all you have to do is ask industry," says Henderson. "We haven't been turned down yet."

He advises that SERCs ask not for money so much as specific services - perhaps free training courses or secretarial help. These kinds of industry donations “have magnified our Title III budget a hundred-fold,” says Henderson. For one regional LEPC conference, a company donated the conference center, the food, and the audiovisual equipment, as well as printing the conference program. The cost to the facility was over $35,000, which, says Henderson, is “‘twice my whole year’s training budget.”

Along with state appropriations, application fees, and industry donations, SERCs also receive funds from the federal government. EPA has provided a limited number of grants for everything from community outreach to training programs, and the Federal Emergency Management Agency (FEMA) has provided grants for training.

Beginning in fiscal year 1993, a portion of fees collected under the Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990 will be applied to state and local Title III programs: a total of $5 million for annual planning grants to states (with 75 percent of that amount passed through to LEPCs) and $7.8 million in annual emergency response training grants to states and Indian tribes (with 75 percent going to train public employees, primarily firefighters).

LEPCs should contact the state agency designated by the Governor as the primary lead for the HMTUSA program to learn more about the state’s planning grant application.

Get Active!

The best SERCs go beyond the letter of the law.

Being a successful SERC means looking for innovative programs in unexpected places and encouraging participation from every sector of society. It also means keeping the spirit of Title III in mind, rather than just fulfilling the letter of the law. “You can’t wait for legislation,” says Joe Quinn of the Nevada SERC. “You’ve got to be very proactive.”

Many SERCs already have most of the ingredients they need to be successful - the next step is organization, followed by learning what others in their region and around the country are doing to further the goal of chemical safety.

‘When I took this job.” says Gordon Henderson of the Delaware SERC, “I thought, this is never going to work. Government people and industry are not supposed to be able to cooperate.”

Nonetheless, he says he’s learned that SERCs really can accomplish good things: “Title III is an idealistic dream that shouldn’t be working, but is.”

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MAKING IT WORK: TITLE III COMPLIANCE

HOME

The Public's Right-to-Know

Hazardous chemicals are a fact of life for every community in the United States. In recognition of that hazard, the Emergency Planning and Community Right-to-Know Act (commonly known as EPCRA or Title III) was passed in 1986. Building upon EPA's Chemical Emergency Preparedness Program and existing state and local efforts, the new law required facilities to report on the presence and release of hazardous chemicals in their communities. This helps state, tribal, and local governments prepare for, respond to, and prevent chemical emergencies. It also makes state and local government officials partners with industry, working to protect public health and the environment.

Under Title III, facilities are required to provide information about on-site hazardous chemicals, to report chemical releases, and to work with local officials responsible for emergency planning. These reporting requirements are central to Title III's goal of improving local emergency preparedness and increasing community awareness of chemical hazards.

Since Title III became law, LEPCs across the country have spent much time and energy identifying the chemical hazards in their communities. To a large extent, their work has increased the safety of emergency responders as well as others in the community. Yet many facilities still expose emergency responders and the general public to needless risks. The reason?

Facilities often don't provide the required information to local officials on chemical identity, use, and storage. The quality of local emergency planning is compromised by this missing information.

Improving the track record of industry compliance with Title III involves three basic elements:

- Identifying facilities potentially subject to Title III;
- Informing those facilities of their legal requirements; and
- Enforcing the requirements.

The first element is to identify those facilities that must report under Title III, whether they fall under section 302 planning requirements, section 304 notification requirements, or sections 311 and 312 hazardous chemical inventory reporting requirements, or section 313 toxic chemical release reporting requirements.

After the facilities are identified, they must be made aware of their responsibilities under Title III. If the businesses don't comply voluntarily, LEPCs and SERCs, in consultation with EPA, may enforce the requirements through civil or criminal suits.

What's Inside…

The Making It Work bulletins are intended to provide technical assistance to those responsible for implementing the Emergency Planning and Community Right-to-Know Act of 1986, commonly known as EPCRA or Title III.

Title III Compliance, the first in the series, is intended for members of Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other agencies responsible for emergency planning and Title III compliance. Future bulletins will cover such subjects as hazards analysis, SERC operations, and funding.

Inside you'll find practical information on Title III compliance, with examples drawn from successful or unique state and local programs. If you know of other innovative Title III implementation programs, we'd like to hear about them.

DETERMINING WHO'S COVERED

Identifying facilities subject to Emergency Planning and Community Right-to-Know-Act (commonly known as EPCRA or Title III) regulations isn't always an easy task. There's no foolproof, sure-fire-method for identifying all the businesses that handle hazardous chemicals in a community, but existing databases and other information resources make the task easier.

Finding out who's handling hazardous chemicals in your community can be time-consuming, but it's a critical first step that makes the task of improving compliance much simpler. And by creating a comprehensive database of chemical facilities and updating it regularly, you'll have a basic organizational framework in place.

LEPCs and SERCs around the country have discovered creative ways to identify facilities subject to Title III regulations. The Washtenaw County, Michigan, LEPC, for example, examined lists of federal permittees covered by the Resource Conservation and Recovery Act (RCRA) and the Clean Air Act By using these existing lists that are available from the state environmental agency, the LEPC saved both time and resources. Other easily accessible community resources include tax records, business permits, hazardous waste permits, utility records, fire inspection records, and the collective knowledge of police, firefighters, and other LEPC members.

The Wyandotte County, Kansas, LEPC took a broad-based approach by placing notices in the annual business tax bills of 4,200 facilities with occupational licenses. The LEPC also made public service announcements on radio and TV; identified potentially regulated businesses from approximately 40 categories of facilities subject to a newly adopted Uniform Fire Code; and mailed a screening survey to facilities that had requested information about the storage of hazardous chemicals.

Some SERCs and LEPCs have found that it's possible to discover violators when investigating chemical emergencies or significant releases. Always be on the lookout for new ideas. There are plenty of untapped resources within easy access, starting with the telephone book-the most accessible list of businesses in your community.

Who Uses What Chemicals?

To help answer this question, EPA has developed a cross-listing of Standard Industrial Classification (SIC) codes, which identifies the type of business activity occurring at a facility, and the Title III section 302 extremely hazardous substances (EHSs). This list, together with county or city information on local businesses, can help identify facilities that may be required to report LEPCs can use this information to identify which types of facilities are likely to use hazardous substances covered under Title III.

This document, A Guide to Chemical Use in Industry: Extremely Hazardous Chemical/Standard Industrial Classification Code Crosswalks for the Emergency Planning and Community Right-to-Know Act CEPCRA), (March 29, 1989) was developed by EPA's Office of Waste Programs Enforcement.

Ignorance Is No Defense

For companies, as well as for individuals, ignorance is no defense when it comes to breaking the law. The 1947 Supreme Court decision, Federal Com Insurance Corp. v. Merrill, stated that "everyone is charged with knowledge of the United States Statutes at large." This means facility operators can't claim ignorance of Emergency Planning and Community Right-to-Know Act (commonly known as EPCRA or Title III) requirements as an excuse for non-compliance.

Even so, the more information companies have, the more likely they are to comply. LEPCs have used many successful methods for reaching and educating businesses potentially subject to Title III, from publishing their own booklets to working with local media.

Target Your Audience

Some LEPCs have worked with local trade associations to target specific classes of businesses likely to be subject to the law. To encourage compliance in New York City, for example, the LEPC identified more than 100 trade associations whose members might be subject to regulation. The LEPC worked with the New York Sanitary Suppliers, the Association of Graphic Arts, and other associations to develop mailings and presentations on community right-to-know issues. The New York City LEPC also offered compliance workshops for the numerous municipal agencies whose facilities might be subject to Title III. These presentations and workshops have resulted in significant numbers of facility submissions.

In Racine County, Wisconsin, the LEPC focused their efforts on farms that were using extremely hazardous substances (EHSs) listed in section 302. When the LEPC received a list of potentially covered facilities from the SERC, the LEPC realized that a number of facilities known to have EHSs above the threshold planning quantity were missing from the list. Only a few farms had reported, yet the LEPC members indicated that approximately 100 farms in the area would be covered under the emergency planning requirements of section 302.

Because list of EHSs did not readily translate into the kind of information farmers could understand (i.e., on product labels), a dedicated group of Racine County LEPC members identified 66 EHSs commonly used in agricultural products and cross-referenced them to more than 1,000 trade names. This list was then taken to agricultural dealers in the county, who identified which products were being used by the local farm community. With information supplied by the agricultural distributors, LEPC members calculated how much of each product a farmer would need to have on hand to be subject to the reporting requirements.

Posters with this information were then printed and distributed throughout the county, as were cards and mailing labels that could be used by farmers to report to the LEPC and name a "facility" coordinator to the LEPC.

Develop Booklets and Brochures

To further spread the word, many states have produced booklets and brochures that explain Title III. These may be general in scope, or may be targeted to specific audiences such as small businesses or farmers.

Kansas developed a brochure titled Guide to Community Right-to-Know Compliance under SARA and Kansas Laws, which explains how to determine whether a facility is covered under the regulations, and how to comply if it is. Kansas also developed a document titled Summary of Registered Pesticides and Pharmaceutical Products in Kansas, which lists EHSs by their trade names and gives threshold planning quantities in gallons rather than pounds, in order to be more familiar to farmers. The booklet even tells how many flea collars add up to the threshold planning quantity.

The Alexandria, Virginia, LEPC published a comprehensive document, What Alexandria Businesses Should Know About SARA Title III, to explain Title III requirements and the role of the LEPC. The document was distributed to all businesses that had been issued a hazardous materials use permit. The Alexandria Chamber of Commerce also helped the LEPC create an exhibit for local business conventions. Title III information has been distributed at trade shows, at the state fair, and to community groups and trade organizations throughout the city~

Work With Your SERC and EPA

LEPCs should also work with their states and EPA to identify and target Title III facilities. States can help by identifying facilities from state permit lists, providing outreach materials, and providing direct technical assistance. Projects aimed at improving Title III compliance have been conducted by LEPCs with assistance from states and EPA in Alabama, Wyoming, North Dakota, and Oklahoma.

In 1988 and 1989, the Calhoun County, Alabama, Emergency Management Agency, worked with two state agencies -- the Department of Environmental Management and the Emergency Management Agency -- on a pilot compliance project with the assistance of EPA Region 4. The team used Dun & Bradstreet data, EPA's list of water and RCRA permit-holders, Title III toxic release inventory reports, county industry and business listings, the telephone directory, and local contacts and interviews to add to the county's existing list of companies subject to Title III.

After identifying 47 facilities likely to be subject to regulation that hadn't yet reported, the LEPC mailed these facilities a comprehensive package of Title III materials, including an explanatory cover letter, a Title III Fact Sheet, the list of extremely hazardous substances, a flow chart on reporting hazardous materials spills, and a list of Title III filing addresses.

With the assistance of EPA Region 4, teams of government officials then visited unresponsive facilities suspected of being covered by Title III. These visits produced the most significant results of the project: 12 businesses subject to section 302 and 17 entities subject to sections 311-312 were identified and informed of their reporting obligations. Within several weeks, almost all had filed the appropriate reports.

Use the Media

Another effective way to reach and educate industry is through the media. Many LEPCs have worked with local newspapers and radio stations to inform the community, and especially potentially covered facilities, of Title III requirements.

In Butler County, Kansas, the LEPC persuaded the local newspaper to run articles on Title III and its significance to the public. The paper ran one major article and several follow-up pieces. The LEPC also ran spots on the radio; one LEPC member was a radio disc jockey, and was able to present the spots himself.

WHEN VOLUNTARY COMPLIANCE FAILS

LEPCs and SERCs are by no means powerless when a company fails to comply with right-to-know laws. A variety of options are available to "persuade" lax facilities into compliance-including federal enforcement actions.

Under section 325 of the Emergency Planning and Community Right-to-Know Act (commonly known as EPCRA or Title III), the federal government is authorized to bring administrative and civil or criminal judicial action against violators. EPA can assess civil and administrative penalties ranging from $10,000 per violation to $75,000 per violation per violation on the owner or operator of a facility that fails to comply with emergency planning (section 302), emergency notification (section 304), community right-to-know (sections 311-312), toxic chemical release (section 313), and trade secret reporting (sections 322-323) requirements.

Criminal penalties of up to $50,000 or five years in prison may also be levied on any person who knowingly and willfully fails to provide emergency release notification. To date, there have been more than 400 Title III complaints filed. Total proposed penalties have reached nearly $11 million, and so far, $1.5 million has been collected.

State and Local Actions

Enforcement at the federal level is only one method of getting a facility to comply with the law. Section 326(a)(2) of Title III authorizes state and local suits as well. State and local governments have the authority to bring civil actions in the U.S. District court for failure to notify under section 302; failure to provide information under section 303; failure to submit MSDSs or a list of MSDSs as required under section 311; and failure to submit facility-specific information required under section 312. These actions do not require prior notification.

Title III even authorizes citizens to initiate civil actions against EPA, SERCs, and/or the owner or operator of a facility for failure to meet legal requirements. Under section 326(a)(l), any person has the authority to file a civil action in the U.S. District court for failure to submit the required MSDSs or Tier I or Tier II information.

Suits and Settlements

Although EPA may go to court to enforce compliance, direct contact with a facility owner or operator may be the most effective way for LEPCs and SERCs to persuade the facility to comply. But outreach and dialogue may not always be enough. If an LEPC has attempted to work cooperatively and a facility still fails to respond to the information request, there is still another course of action: the LEPC can notify the facility owner or operator that it intends to file a civil action in the U.S. District Court, or it can assist the SERC and EPA in their enforcement efforts.

In these cases, thorough documentation of activities is essential. Establishing a record of an LEPC's efforts to encourage voluntary compliance will aid the state and EPA in taking an enforcement action. Make sure to maintain records of telephone and other contacts with facilities, letters – anything that seems relevant. Even if the state or EPA take formal legal action, a cooperative settlement usually follows. Settlements have proven effective means of resolving Title III compliance problems. And in some cases, innovative settlements have provided badly needed funding for SERCs and LEPCs. For example, EPA Region 1 filed a consent order in November 1990 for a settlement that will benefit local emergency planners. Champion International, a large woodmill in Hancock County, Maine, delayed notifying the National Response Center, SERC, and LEPC after an accidental release of chlorine, thus violating both CERCLA section 103 and Title III section 304. The facility admitted its negligence and arranged a mutually beneficial settlement with the community. Ultimately, Region 1 proposed a civil penalty of $20,000 in its administrative complaint, however, the parties settled for a penalty of $12,000, $6,000 of which was paid to the U.S. Treasury and $6,000 was paid to the "Hazardous Substance Trust Fund." In addition, the company provided computer hardware and software to the Hancock County LEPC of an approximate value of $5,000, which allowed the county to expand its data gathering capabilities.

Other innovative settlements have called for an external firm to conduct an annual environmental audit on the facility for a specified period; for a representative of the facility to attend regularly scheduled meetings of the LEPC; and for the facility to submit articles on Title Ill reporting requirements to industry journals.

Title Ill by the Numbers

Section 302 - Planning Notification Requirement. Requires the owner or operator of a facility at which an extremely hazardous substance-(EHS) is present at or above a threshold amount to notify the SERC and LEPC that the facility is subject to the emergency planning provisions of Title Ill.

Section 303 - Emergency Response Plans. To assist LEPCs in developing local emergency response plans, this section requires the owner or operator of a facility subject to section 302 to designate a facility representative who will participate in the planning process. This section also provides authority for the LEPC to request any information from a facility that it needs for-emergency planning and response.

Section 304-Release Notification Requirement. Requires facilities to notify LEPCs and SERCs immediately if there is a release into the environment of an EHS or hazardous substance (at or above a designated reportable quantity) regulated under the Comprehensive Environmental Response, Compensation, and Liability Act.

Section 311- Reporting Requirements. Requires facilities that have hazardous chemicals present above certain thresholds to submit either Material Safety Data Sheets (MSDSs) or a list of MSDS chemicals to the LEPC, the SERC, and the local fire department. MSDSs typically include the identity of chemicals and their hazardous components, physical and chemical characteristics, fire and explosion hazard data, reactivity and health hazard data, and precautions for safe use and control measures.

Section 312-Reporting Requirements. Requires facilities subject to section 311 to submit an annual inventory form on the quantities and locations of hazardous chemicals to the LEPC, SERC, and the local fire department. The facility may submit either a Tier I, Tier II, or equivalent form developed by the state. Tier I requests aggregate information on hazardous chemicals according to the type of physical and health hazards they represent. The Tier II form requests chemical-specific information.

Section 313-Toxic Chemical Release Reporting. Requires manufacturing facilities to complete a Toxic Chemical Release Inventory Form (Form R) estimating annual releases to the environment (air, water, or land) for more than 300 specified toxic chemicals, if they manufacture, process, or otherwise use certain chemicals above specified thresholds during a calendar year. This information is reported to EPA and the state.

State and Local Legislation

States and communities have the option of passing their own legislation to augment enforcement capabilities. As of early 1991, 27 states already had Title Ill legislation on the books, and seven had plans to introduce legislation soon.

A Wisconsin statute authorizes the SERC to initiate enforcement actions against facilities for failure to provide notification pursuant to section 302(c), failure to respond to a request for information pursuant to section 303(d), or failure to submit a response to a request for Tier II information pursuant to section 312(e). Illinois has passed the "Illinois Emergency Planning and Community Right to Know Act," which codifies Title III into state law. In addition, the Illinois Emergency Services and Disaster Agency became the first state agency to make referrals to EPA concerning violations of section 304 of Title III. In Washtenaw County, Michigan, the County Commissioners' passage of right-to-know legislation enables the county Board of Health to require the reporting of right-to-know information, to inspect facilities, to assess penalties, and to assess inspection fees. The law is broader than Title III in that it covers chemicals on a state registry as well as the OSHA hazardous chemicals.

The New York City LEPC, which has one of the largest and most complex planning missions in the country, is authorized by a local regulation to conduct inspections, initiate civil actions, and assess penalties for violations of its own community right-to-know law.

Setting Examples

Some LEPCs have used enforcement measures against individual offenders as a means to improve voluntary compliance among other facilities. In these cases, the LEPC might enforce Title III requirements at a particular facility within the community and then publicize the results widely. This can be a simple, cost-effective way of getting fast results, since no facility wants negative publicity in local newspapers, radio, or on TV news shows. Other facilities will be likely to respond if they are faced with a fine or another tangible example of what might happen if they fail to comply.

A large-scale enforcement initiative is another effective way to use publicity to increase compliance. In a national initiative, cases throughout all 10 EPA Regions are filed simultaneously and then publicized both in the Regions and at Headquarters. Between 1988 and 1990, EPA has conducted three such coast-to-coast enforcement initiatives to highlight the requirements of Title III and encourage full compliance by other facilities. These "sweeps" heighten community awareness and cause many facilities to realize the need to comply or risk uninvited public scrutiny.

Use Your Local Fire Department

The fire department can be another valuable ally in reaching out to your community. Under Title III, LEPCs must include local fire officials, who typically lead the response to hazardous material accidents. Also, Title III provides fire departments with access to inspect reporting facilities' storage and handling of hazardous chemicals. Fire departments also work closely with businesses on fire prevention plans and pre-fire plans. Fire fighters are often familiar with a facility's operations and are in close contact with its management, especially if the facility has on-site hazardous or flammable materials. In some communities, during routine fire inspections or other inspections, fire departments have the responsibility for assessing whether a facility is subject to Title III.

An Alexandria, Virginia, city ordinance requires all businesses that store, use, or handle hazardous chemicals to obtain a permit from the fire department. As part of the review and approval process, the fire department conducts a facility inspection, which verifies the types and quantities of hazardous chemicals at the site. When they file for a use permit, the companies are sent a comprehensive Title III information package. Failure to comply with Title III might prevent the facility from receiving its permit and, therefore, from operating. Thanks to this permitting process, the city believes it has achieved a high rate of compliance with Title III. In addition to routine permit inspections, the Alexandria fire department also conducts inspections to identify facilities subject to Title TII regulations that haven't yet reported. The fire department targets businesses that haven't reported but which are believed, based on department personnel's knowledge and experience, to handle hazardous chemicals.

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CHEMICALS, THE PRESS AND THE PUBLIC: A JOURNALIST'S GUIDE TO REPORTING ON CHEMICALS IN THE COMMUNITY

HOME

A publication of the National Safety Council's Environmental Health Center

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For More Information

The National Safety Council maintains the Crossroads Web site at http://www.crossroads.nsc.org as a resource supplement to this series of publications. The site has Risk Management Program-related links to organizations, regulations, chemicals, rules, and regulations involved in emergency management and the safe handling of chemicals and other safety, health, and environmental issues. A selection of articles and papers written about the Risk Management Program Rule and local efforts to identify and analyze risk in the community is also included. The site will be constantly expanding as industry and communities develop new information required under the Risk Management Program Rule.

Preface: March 2000

Environmental journalists have a new weapon in their arsenal for better informing their audiences about potential risks and hazards close to home. The new tool provides them with one more powerful resource for better informing their print and broadcast audiences on how to reduce potentially risky exposures and, better yet, how to help avoid exposures in the first place.

The 1990 Clean Air Act's Section 112(r) paved the way for journalists and the public to access the new chemical "risk management plan" (RMP) information, but the data itself first became widely available online and in hard copy only in the summer of 1999, after much controversy over just how much -- and which parts -- of the information would even be distributed electronically.

The RMP information comes on the heels of another three-letter acronym well known to environmental journalists: TRl, or the toxics release inventory, is also available electronically to provide reporters, the public, and local emergency response teams accurate information on facilities' on-site inventories and releases of toxic chemicals.

One more acronym, again one well known to environmental journalists, is RTK, or right to know. RTK is the movement that got a major boost in 1986 with passage of the· Emergency Planning and Community Right to Know Act (EPCRA) as part of the Superfund amendments passed that year. Consider this formula:

RMP = TRI + RTK

The RMP program, the subject of this sequel to the Environmental Health Center's 1989 Chemicals, the Press & the Public reporter's guide on the TRl program, is the progeny of more than a decade of experience with TRl and RTK generally. In the current vernacular, reporters might look to RMP as something of a TRl on steroids. Or perhaps Viagra.

Just how, and how effectively, the media uses this new trove of hazardous chemical information remains to be seen. The data available clearly are more specific, and therefore more powerful, than what facilities previously had been required to report. Reporting facilities now must make public potential risks posed to surrounding communities.

But reporting on local facilities' efforts to prevent accidents from happening in the first place may be just the "day-one" story. Reporters and their audiences might find equally appetizing the "day-two" story of just what local governments and policy makers are doing, and in some cases perhaps not doing, with the newly available information to make disaster and accident prevention a reality and not solely a paper or academic exercise.

The information power represented by the RMP program is considerable. But data have limits and recognizing both the strengths and the practical limitations of the RMP data is key to responsible and knowledgeable reporting in this area. As did its predecessor reporter's guide Chemicals, the Press & the Public, this guide seeks to help journalists -- and through the media, the public generally -- get every last ounce of useful information out of the RMP program information. Equally, it seeks to help them recognize the inherent limitations-where, as they say, the dog just won't fight. At that point, of course, additional enterprise reporting becomes key.

How communities themselves will choose to use the newly available RMP information likely will vary from place to place, but that factor cannot and should not influence the media's responsibilities to provide the relevant information as clearly and as accurately as possible.

Study after study reinforces that most of the people most of the time get most of their information on the environment from the mass media. That's a sobering burden that both delights and somewhat scares responsible journalists having to shoulder that responsibility.

Through the RMP program as it has built on and expanded its RTK and TRI roots, society has provided itself and its news media with a new tool for staying abreast of potential community risks from hazardous chemicals. With that new tool goes journalists' responsibility to use it wisely. We hope this reporter's guide will prove useful in meeting that objective.

Bud Ward, Executive Director, Environmental Health Center, National Safety Council, Washington, DC

The Bhopal Disaster

Just after midnight on December 3, 1984, many residents of Bhopal, India, (population 900,000) awoke with their eyes burning and coughing and gasping for breath. A toxic cloud was drifting through the shantytown neighborhoods surrounding the plant where Union Carbide of India, Ltd., was manufacturing pesticides to help Indian farmers feed a booming population. For nearly two hours, a deadly cloud of some 40 tons of toxic methyl isocyanate crept along the ground 5 miles downwind. Few of those rubbing their eyes and stumbling outdoors had any idea what was happening; most could do little. To protect themselves.

The uncontrolled release killed approximately 1,430 people immediately, and more than 3,800 died by 1991. Many thousands more were injured-possibly 20,000 were severely injured (many totally disabled), and another 186,000 were less severely injured. Deaths and injuries were worst among the desperately poor who lived just outside the chemical plant's fence. But the numbers will never be very precise, because information was scarce.

The investigations that followed, conducted by Union Carbide and various Indian government agencies and outside panels, probably never got the whole truth. Politics, emotion, self-interest, information suppression, and contamination: of evidence clouded almost all attempts to describe what happened. By most accounts, however, it was clearly the biggest industrial disaster in modern times.

Union Carbide, one of the largest corporations in the world at the time, faced more than $3 billion in liability claims from the Indian government. The Indian government accused the company and. Its U.S. officials of criminal homicide. The company accepted "moral responsibility" and, eventually, $470 million in liability, but it emphasized its own investigators' conclusions -- that the release had been caused by sabotage by a disgruntled employee. Other accounts pointed to error, negligence, and bad maintenance by the plant's operators or to an inherently unsafe size and design imposed on the plant by the U.S. parent company's engineers.

Bhopal was a disaster waiting to happen. Warnings of all kinds were ignored. The back-up safety systems didn't work – temperature and pressure gauges, refrigeration units, gas scrubber, flare tower, water curtain, overflow tanks, and alarm signals. Plant operators failed to respond promptly or effectively to instrument readings and other signs. In May 1982, a Union Carbide safety team from the U.S. headquarters had reported the potential for just this kind of accident. And a series of local newspaper articles before the incident had warned residents of the hazards.

The Bhopal plant disaster was a warning that Congress heeded when it passed the Emergency Planning and Community Right-to-Know Act of 1986, which had been known as the "Bhopal bill."

Chapter 1: Introduction and Background

In the summer of 1999, a new generation of hazardous chemical information went online and became available to reporters and the public. Even before its release, it generated intense controversy. June 1999 was the deadline for approximately 64,000 facilities to file their risk management plans (RMPs) required by Section 112(r) of the Clean Air Act (CAA). The law was amended in August 1999 by the Chemical Safety Information, Site Security, and Fuels Regulatory Act (P.L. 106-40) to exempt about half of those facilities from reporting-primarily those selling propane and other flammable fuels.

The RMPs contain chemical hazard data that are more specific than companies were previously required to report. For example, companies must identify potential hazards and the possible harm these chemicals could do to surrounding communities. These analyses, referred to as offsite consequence analyses (OCAs), include both "worst-case scenarios" and "alternative (or more realistic) scenarios."

The law requires the U.S. Environmental Protection Agency (EPA) to make the RMPs available to the public. In fact, public, disclosure of the RMP data has become a big story itself. The August amendments strictly limited the dissemination of the OCA information for at least 1 year. By August 2000, EPA must assess the risks and benefits and issue regulations about how the OCA data will be disseminated; executive summaries and other RMP information are available on the Internet through EPAs RMP*Info™. In addition, most of the facilities reporting under the law are required to hold a public meeting to discuss their RMPs, including OCA information.

Accident Prevention-the New Name of the Game

The real news about the RMPs and other provisions of the 1990 law is that they provide additional incentive for companies, communities, and reporters to focus on preventing accidents from happening in the first place. Perhaps the other real news is that, while the 1986 Emergency Planning and Community Right to Know Act (EPCRA) required committees of local emergency officials to file plans, the RMP Rule requires the companies to file plans. The question is shifting from "What is the local government doing to prevent disaster?" to "What is the company doing to prevent disaster?"

The good news is that companies can do a lot today to reduce the likelihood that accidents will happen or that accidents will harm people if they do happen. Many of these strategies also help reduce routine toxic emissions. Some examples include using up dangerous chemicals as soon as they are produced to keep the onsite inventory down, using safer chemicals, and handling chemicals at lower temperatures and pressures. Good operating procedures, good operator training, and good maintenance are other examples.

Still, chemical hazards cannot be prevented unless they are first understood and foreseen, and good information is one of the key ingredients in managing these hazards. The stories of almost all the terrible chemical disasters of the last century can easily be told as stories of warnings unheeded. It isn't necessary to wait for disasters to happen.

What to Expect from this Book

This book provides a summary of the requirements for RMPs and related activities and the requirements under EPCRA. This book attempts to explain not only the enormous potential of the available chemical information, but also the limitations of the data. It provides tools and tips to help you interpret the chemical risk information. It includes some examples of reporters' actual experiences reporting on chemicals in the community, some tips and insights on reporting on chemical emergency planning and actual chemical emergencies, and a discussion of some of the limitations of the chemical hazard data. Several sections of the book contain lists of suggested questions. These are among the most important tools in this book.

The RMPs are typically full of the technical jargon. This book attempts to decode some of it. But to get the real story, reporters may have to pursue company officials into technical thickets beyond the scope of this book. However, this book will try to lead you to sources that can help.

Why Cover Hazardous Chemical Stories?

If you are a reporter or producer, you may have had to pitch a toxic chemical story to a skeptical editor. Maybe the front page was crowded with train wrecks, politics, and crime, and your editor wanted to know why there was a story if nobody had been killed. According to the Chemical Safety and Hazard Investigation Board (CSB) (1999), toxic and hazardous chemicals do kill an average of more than 250 people every year.

Fortunately, the disastrous explosions that make electrifying footage are fairly rare. That's part of what makes them news. But there's a lot more to the story. Smaller releases injure or kill workers almost daily. They can also force people from their homes, snarl freeway traffic, make asthmatic children wheeze, and disrupt lives in other ways. The chronic everyday leaks and emissions of toxic pollutants in some places are suspected of causing elevated rates of cancer, birth defects, and neurological and reproductive disorders. In many towns, jobs are at stake or are perceived to be.

Information about the risks of hazardous chemicals is a very hot commodity. Environmental groups strive to get it into public hands, sometimes magnifying the risks. Chemical companies have lobbied and litigated against disclosure at the national level, sometimes downplaying the risks or citing new risks from terrorism or sabotage. People's lives and health can depend not only on the availability of the information, but also on its accuracy and realism.

Consider some examples. A huge explosion devastated the Terra Nitrogen Company fertilizer plant near Sioux City, Iowa, on December 13, 1994. Four people died and 18 people went to the hospital. More than 5,700 tons of anhydrous ammonia spilled, and nitric acid and liquid ammonium nitrate also spilled in large amounts. A cloud of toxic ammonia lingered for 6 days, spreading for miles around the plant. About 2,500 people were evacuated.

A subsequent EPA investigation showed many problems. Safety audits had been inadequate. There were no written procedures for safe operation of the plant. Employees said they were unaware of the hazards of ammonium nitrate. Four years later, Terra admitted that by failing to report some 17 million pounds of toxic chemical releases to the environment in 1994, the company had hidden the fact that it was one of the largest emitters of toxic substances in the country.

The General Chemical plant near Richmond, California, drew up a worst-case scenario for a chemical release from its facilities, as required by state law. Company officials predicted a worst-case accident would affect people no farther than 1314 miles away. Then on July 26, 1993, a release of sulfuric acid mist (sulfur trioxide) from the General Chemical plant sent 24,000 people to clinics and emergency rooms. People were affected more than 9 miles away.

Many communities will be interested in learning about hazardous chemicals that can jeopardize their health. They will also be interested in finding out the level of risk posed by local facilities. Chemical hazards are more likely to be addressed if local stakeholders -- people who would be affected by an accident -- know about potential problems and have a say in the solution. Stakeholders include individuals such as company managers, workers, and stockholders; neighboring residents and workers; and local officials.

Different communities will reach different decisions about the information they learn from RMPs. According to Carole L. Macko of EPA's Chemical Emergency Preparedness and Prevention Office, "The final evaluation of risk will be made by the public and local officials at the local level." Audiences will be interested in the reactions of local emergency authorities, government officials, business leaders, facility managers, neighbors, and environmental groups to RMP content. News coverage can help people evaluate their options. Some communities may think they have to live with poorly managed hazards when there may be alternatives. Once they know about hazards and risks, communities can choose to use or ignore that knowledge. But without local coverage, RMPs will be like the proverbial tree that fell in the remote forest without being heard.

Ten Years of Toxic Release Inventory

In 1986, Congress gave journalists a valuable tool when it passed EPCRA, in many ways the first full-fledged chemical right-to-know law. The law, which was not fully implemented for several more years, did four important things:

- It set up a state and local institutional structure to plan for chemical emergencies and required the response plans to be made public.
- It required plants to notify local, state, and federal authorities when a major release occurred.
- It required companies to estimate and report their toxic releases to EPA and state agencies.
- It required EPA to collect this information in a national database (the Toxic Release Inventory) and make it available to the public.

The Toxic Release Inventory (TRI) database gave environmental reporters more than just handy local statistics -- it gave them a powerful investigative tool. Suddenly reporters could look at patterns of pollution in all kinds of meaningful ways. For example, reporters could examine the environmental performance of a single large company in many sites across the country. Reporters could locate the hotspots of pollution by a single toxic substance like benzene, a known carcinogen. Reporters could compare the releases companies were reporting with information from other sources (such as state or federal permit programs) to determine whether companies were doing what they said they were.

TRI has become a "meat-and-potatoes" story -- a reliable, stable source of stories on the environmental beat. The stories tend to ask and answer some basic questions. Who are the worst polluters in our area or state? How does our state match up against others? Are we doing better than last year?

Because the TRI has now accumulated more than. 10 years of data, it can be used to analyze important pollution trends. EPA and others have made enormous strides in integrating TRI with many other EPA databases and environmental databases by using standardized facility identification numbers and geographical information systems. New user-friendly front ends like EPA's Envirofacts Warehouse (www.epa.gov/envfro) and the Environmental Defense Fund's (EDF) Chemical Scorecard (www.scorecard.org) have made using the data much easier to use.

Chemicals -- Substances with an Image Problem

The word "chemical" carries negative baggage. People are often suspicious about the harm (e.g., cancer, birth defects, reproductive and neurological disorders) chemicals can cause. But without chemicals, we could not feed the world, drive our cars, cure disease, print newspapers, or use computers.

Most of our physical world consists of chemicals. But when we use the word, we often mean compounds that have been synthesized by chemists or that are used in industrial processes.

The media often gets caught up in this emotional portrayal of chemicals and their risks and benefits to society. This is understandable. On the one hand, the chemical and manufacturing industries have public relations machinery telling us that chemicals are the answer to our problems; that the risks they present are negligible and under control, and that any further government control of those risks is unnecessary. On the other hand, environmental and health groups raise concerns about cancer clusters, contamination in the water and air, and the harm that potential chemical spills might do to neighbors of chemical plants.

Chemicals have numerous benefits in today's world. Without sewage treatment and drinking water purification-processes that involve chemicals-sickness and death from waterborne diseases like typhoid and cholera would not have been largely eliminated. Chlorine and chlorine compounds play a key role in water disinfection and in the synthesis of many chemicals used in modern life. Chemistry also played a big role in the development of antibiotics, which have cut death rates from infectious disease worldwide. Synthetic pesticides and chemical fertilizers, along with improved seed, helped increase production and fuel the "Green Revolution," which has reduced starvation in much of the world.

Our society's confidence in chemicals began to dwindle in 1962 with the publication of Rachel Carson's Silent Spring. At this time it was also discovered that insecticides like DDT, relied on for their dramatic help in controlling crop pests and human disease, were persisting in the environment and accumulating in living creatures, with devastating effects. By the end of 1962, some 40 pesticide regulation bills had been introduced in various state legislatures.

Chemical Regulation and the Role of the Media

The rise of the environmental movement and the institutionalization of environmental controls in the 1970s and 1980s often occurred through a crisis-and-response process.

A 3-million-gallon oil spill in the Santa Barbara Channel in 1969 led Congress to give the Coast Guard and EPA oil spill response authority in Section 311 of the 1972 Clean Water Act.

The seepage of toxins into the basements of the people of Love Canal, New York, in 1976-1978 led to the Superfund hazardous waste cleanup law in 1980. The Bhopal disaster of 1984 led to the passage of EPCRA in 1986. The Exxon Valdez spill of 1989 brought passage of the Oil Pollution Act of 1990.

The press has typically played a role in publicizing a threat or a crisis.

But it has been less involved in covering the political in's and out's of legislative solutions or in the tedious technical and regulatory process of implementing environmental laws.

That job has too often been left to the specialized trade and business press. The result is that average citizens often know little about what, if anything, the government is doing to protect them against hazardous chemical risks.

When the president signs a major environmental bill, it gets on the nightly television news. But the story isn't over at that point.

If the press doesn't follow up on legislative or regulatory action to make sure government is doing its job, the public may go unprotected.

An example is the hazardous air pollutant provisions of the 1977 Clean Air Act Amendments That law required EPA to set national emission standards for hazardous air pollutants. But by 1990, EPA had set standards for only seven of the hundreds of toxic or hazardous air pollutants to which people are exposed, in part because scientists are unable to identify an air concentration or exposure level at which the risk to health is zero for many of these pollutants.

Even at infinitesimal amounts, these pollutants can present risks, although the risks may be infinitesimal. Setting standards for some toxic air pollutants would have removed them from commerce altogether.

There was no perceived "crisis." Health and environmental groups ·complained, but the deadlock got little press attention.

News consists of something happening, and this story was about something not happening-and something dry and technical to boot. Congress finally tried to fix the situation in the 1990 CAA. The 1990 law took a new approach based on industry sectors and best achievable technology.

The 13 years of paralysis on air toxics from 1977 to 1990 is an example of the perfect being enemy of the good. It also demonstrates the shortcomings of the way the press (and environmental health advocates and the public) often look at risk.

Readers, viewers, listeners, and editors may simply want to know if a thing is true or untrue, safe or unsafe, and have little patience for shades of gray.

Toxics become news when a camera crew finds a weeping mother whose child has been stricken with leukemia or when a siren sounds and a thick, black cloud towers above the local petrochemical refinery. But the quiet, everyday stories are just as important.

Once TRI data started to be reported in the late 1980s, people started to get a concrete sense of the huge amounts of toxic and hazardous pollutants emitted every year.

The estimate for 1988, the first year for which TRI data were reported, was that U.S. facilities released 3.35 billion pounds of toxic substances to air, water, and land. And most of these releases were completely legal.

Regulation Through Information

EPCRA embodied some rather revolutionary ideas about government. Part of the philosophy was "forewarned is forearmed."

EPCRA came at a time when there was very little effective government regulation of toxic air emissions.

The hope of some of the bill's supporters was that if the American public was really aware of the problem, something might be done to reduce risks. While there may be no scientific proof that EPCRA reduced hazardous chemical releases, the evidence is abundant.

During the first 10 years of TRI reporting, the estimated releases of toxic substances have dramatically and steadily reduced. Releases of core chemicals -- those that have been reported consistently for the entire 10 years-decreased by 1.53 billion pounds from 1988 to 1996, a decline of 45.6%.

The largest reduction by weight was in air emissions (1.10 billion pounds or 49.8%). In terms of percentage reduction, the largest decrease was in surface water discharges (119.4 million pounds or 72.6%).

Why believe the reduced releases were caused by TRI? One reason is relatively few major new regulatory requirements limiting toxic releases were issued during that period. The requirements of the CAA didn't start kicking in until the period was mostly over.

Some of the evidence is anecdotal and subjective, but chemical executives have acknowledged the impact. "The law is having an incredible effect on industries to reduce emissions, and that's good," Tom Ward of Monsanto told the Iowa's Quad City Times in the June 8, 1990. "There's not a chief executive officer around who wants to be the biggest polluter in Iowa."

The Los Angeles Times reported in the December 9, 1991, issue that Caspian Inc., a California metal milling and finishing firm, found itself ranked as the 55th largest emitter of carcinogenic air pollutants in the United States.

The firm responded by developing a water-based coating that could be substituted for one containing the carcinogen perchloroethylene. It reduced its toxic emissions 60% in the first year and eventually by more than 99%.

Sources of Chemical Releases

A reporter or producer thinking about chemical emergencies and toxic releases will find more stories by thinking "outside the box." The big chemical companies have usually done far more safety engineering than other companies.

If you think your viewer or reader area doesn't have chemical risks because it has no big chemical plants, you may be missing the story.

For example, accidents and releases occur most often at fuel-handling facilities, including propane dealers. The second most common "accident-prone" facilities are municipal drinking water purification and sewage treatment facilities.

Both store and use large quantities of chlorine, a highly dangerous gas, to disinfect water.

Agricultural retailers make up a major group of the facilities required to file RMPs. They may handle such things as fuels, pesticides, anhydrous ammonia, and ammonium nitrate fertilizer.

Many different industrial sectors can present chemical hazards. Some are obvious, like explosives or fireworks factories.

Others may be less obvious, such as any place with a large refrigeration facility that uses ammonia, even a warehouse or supermarket.

A wide variety of manufacturing facilities use significant amounts of hazardous chemicals -- everything from toy manufacturers to pulp mills to shipyards.

Chronic and routine releases may cause even more harm than catastrophic ones, but they often get less attention from the media.

TRI includes these routine waste-streams to the air, water, and land. While many of these chemical releases are controlled under federal permits, others are virtually unregulated.

A plant may be releasing toxics but may not need to report it. The amounts involved may be below the reporting threshold, or they may consist of many small leaks; long-term, low-level leaks (fugitive emissions); or storm-water runoff from a large land area (known as nonpoint source water pollution).

While people often associate releases with industrial plants, about the same number result from transportation-related incidents.

Hazardous substances may move by air, truck, railcar, boat, or pipeline. Of the roughly 600,000 chemical incidents reported between 1987 and 19-9-6, 42% occurred at fixed plant or business sites, while 43% were related to transportation (the rest were "other") according to the CSB (1999).

Often the people most endangered by both chronic and catastrophic releases are the employees at the plants. They may be in direct physical contact with hazardous substances, often in large amounts. In some cases, their exposure may be daily over many years with cumulative effects.

Government Agency Roles in Chemical Releases and Exposure

Many different government agencies are involved in responding to and preventing chemical releases and emergencies.

While this book focuses on two particular EPA programs (EPCRA and the RMP program), a reporter may have to talk to many other government agencies to get the whole story.

Occupational hazardous and toxic exposures, for example, are regulated by the Occupational Safety and Health Administration (OSHA). Pipeline safety issues are regulated by the Department of Transportation's (DOT's) Office of Pipeline Safety.

Other modes of hazardous materials transportation fall under the DOT's Office of Hazardous Materials Safety. Accidents may be investigated by the National Transportation Safety Board (NTSB), OSHA, or the CSB. The Federal Emergency Management Agency (FEMA) may also be involved in responding to chemical disasters.

Various state agencies may be involved with regulating chemical hazards and responding to emergencies.

The central point for coordinating government response to chemical releases is the National Response Center, which is operated by the U.S. Coast Guard. The NRC was created by the National Oil and Hazardous Substances Pollution Contingency Plan, Title 40 CFR, Part 300.

All oil, chemical, radiological, biological, and disease-causing discharges into the environment anywhere in the United States must be reported to the NRC.

All reports of pollution incidents are entered into the Incident Reporting Information System (www.uscg.mil/foia.htm). None of these even touches on what may be the most important agencies of all-the local emergency responders.

Chapter 2: Tales from the Trenches: Reporters' War Stories

In 1989, in the dawn of "computer-assisted reporting," Congress had required EPA to put a huge database full of local detail about the use and release of hazardous chemicals online.

They called it TRI, the Toxic Release Inventory, and many reporters (and environmental activists) thought it would be the silver bullet, the ultimate investigative tool. They were right and wrong.

Ten years of experience with TRI has shown some ways in which those high expectations were justified-and some ways in which they were not. Journalists have done hundreds and hundreds of good stories using TRI, and some have discovered the pitfalls along the way.

Finding and Digging for Hidden Treasure with a Computer

In the fall of 1988, Scott Thurm, a reporter with the Louisville Courier-Journal, asked Kentucky state officials to see the toxic release reports for the state.

EPA's electronic database would not be available until 1989, and the 1,254 individual reports submitted by 254 facilities were being stored, largely unread, in cardboard boxes in a state office in Frankfort.

Thurm went to the Kentucky Department of Environmental Protection to look at the forms and then entered selected information from the written copies into a database on a portable computer.

Handling the data himself allowed him to pick out things no computer could have showed him.

Thurm noticed, for example, that an aluminum refiner reported it was sending 14 million pounds per year of aluminum dross to a disposal site at a former quarry.

Thurm happened to know that EPA had proposed this quarry the Superfund National Priority List precisely because of the environmental hazards posed by aluminum dross previously discarded there.

"Watching the reaction of a top state environmental official when I asked why this was being permitted made all of the work seem worthwhile,'' Thurm recounted.

The Courier-Journal's analysis revealed all sorts of interesting things. Most importantly, it was clear that Kentucky's major industries were emitting a wider variety of potentially hazardous air pollutants than the state had previously been aware of, including several suspected carcinogens that were completely unregulated. Other findings included the following:

- The TRI data revealed places where large amounts of toxic barium, chromium, and zinc might be entering the sewers of the Louisville-Jefferson County Metropolitan Sewer District – previously unknown to officials.
- From the TRI data reported by the newspaper, the Louisville-Jefferson County Metropolitan Sewer District discovered that 130,000 pounds of acrylonitrile (a probable carcinogen) could be going into its system. The district did not test for this chemical.
- In the Jefferson County Air Pollution Control District, TRI data revealed firms emitting more of some hazardous chemicals than they had reported previously-33 times more in the case of certain emissions of the toxic solvent toluene.
- On only 3% of the forms did companies volunteer information about what they were doing to reduce emissions.

Thurm said the project

> generated as much response as any other environmental story I've written. First, about a week after I started putting information into a computer, state officials-who had ignored the reports for three months-did likewise. I suspect they didn't want me to know anything they didn't know. Whatever the reason, it allowed them to start probing discrepancies with permits and other records. Second, officials were genuinely surprised by the totals.

According to Thurm, as a result of the Courier-Journal's analysis, state and local officials started taking action to control some of these problems.

They began revising Kentucky's regulations for air releases of toxic chemicals and commissioned a comprehensive environmental study of the area around a chemical complex in western Kentucky that the reports showed to have the most concentrated releases.

What was important was not merely the gross statewide totals (225 million pounds of toxic chemicals released in 1987) or the listings of which counties had the greatest emissions.

What mattered in the end was that the story was being clone at all.

It focused the attention of the public, state and local officials, and the companies themselves on environmental problems that were not being regulated.

That was just what the 1986 law that created TRI was intended to do.

The Courier-Journal was way ahead of state regulatory agencies in analyzing the data and in pointing to the problems the data revealed.

Realizing the Pitfalls: Data Are Only Human

Another experience, recounted by Mitchel Benson, then a reporter for the San Jose Mercury News, showed how things can go wrong with TRI data.

In August of 1988, the Silicon Valley Toxics Coalition held a news conference on the lawn outside a San Jose manufacturing plant.

With the first batch of TRI data in hand, the group announced that 25 major corporations in Santa Clara Country (a.k.a. Silicon Valley) had legally dumped more than 12 million pounds of toxic and cancer-causing pollutants into the air, land, and water. Furthermore, the coalition proclaimed, Advanced Micro Devices (AMD), a Sunnyvale, California, semiconductor maker, was the county's top polluter, based on data AMD itself had filed for the TRI.

"I should have called AMD right then and there,'' Benson said, "but, frankly, I didn't. Why? Because I had copies of AMD's actual reports. And I could see in black and white where the toxics coalition was getting its numbers. The next morning, after the story appeared, AMD's press officer called me," Benson recalled. "In fact he called me several things."

Benson's story was wrong, and the toxics coalition was wrong -- because, it turned out, AMD had filled out the EPA forms wrong.

They filled out the forms to say that tons of extremely potent acids were being dumped directly into San Francisco Bay, when in fact the acids were being neutralized into rather benign salts before being discharged. Benson says he learned one thing: "Check everything twice -- maybe three times."

The lesson is that hard data and computer analysis can often inspire more confidence than is really justified. Data and analysis are only as reliable as the people who produce them.

Understanding the Annual Release of TRI Data

Every year, generally around May-or June, EPA puts out its annual TRI Public Data Release Report. It neatly and exhaustively summarizes the TRI data collected for the previous year's reporting cycle.

And every year reporters all over the country do stories on EPA's report. Most often, they write about the national trends and try to localize the toxic release story to their area. The abundance of both local and comparative data makes it easy to localize.

The TRI report analyzes data by state, industry, chemical, medium (air, water, land), type of release, and even, in some cases, potential health effects.

The annual TRI report may also have special focus sections on carcinogens, pesticides, waste-streams, or source reduction.

Other sections focus on specific industries such as petroleum, pulp and paper, and chemical products (which is further broken down into categories like plastics, drugs, and other products). It also includes all the necessary background, context, and caveats about the limitations of the data.

There is a time lag in reporting TRI data that may throw your editors for a loop if they are not familiar with it. For example, the "1996" TRI annual report actually came out in 1998.

Companies don't report on their releases for a year (until June of the following year). EPA then takes almost a year to organize the data and prepare a report. Tell your editor no news organization has data any fresher than this.

The lead paragraphs on most TRI annual report stories tend to be fairly predictable:

From the July 3, 1998, Puget Sound Business Journal -- Washington companies that discharge toxic chemicals released 2.6% less in 1996...”

From the June 19, 1998, Morning Star (Wilmington, NC -- "North Carolina industries cut legal toxic releases to air, land, and water by 6% in 1996, lowering the state's national ranking from 7th to 10th, the Environmental Protection Agency reported."

From the June 19, 1998, Indianapolis Star -- "Indiana ranks fifth in the nation in the millions of pounds of toxic releases to air, water, and land. And it's largely due to Nucor Steel in Crawfordsville."

From the June 20, 1998, Deseret News (Salt Lake City, Utah) -- No matter how you add it up, Utah's top corporate polluter and one of the nation's top polluters -- is still Magnesium Corporation of America in Tooele County..."

From the June 19, 1998, Denver Post -- "The quantity of toxic chemicals emitted into Colorado's air dropped by 14% in 1996 over the previous year, but releases into surface water shot up 209%, according to a report..."

TRI annual report stories tend to focus on "how our state did," "best-and-worst-of," top 10s, rankings, and trends of improvement or aggravation in pollution.

These are all meat-and-potatoes stories. They have plenty of hard facts and often include a local angle.

The timing is fairly predictable (EPA issues a media advisory at least a day ahead), and it is often newsworthy enough for the front page. Reporters tend to take what they get from the report rather than doing a lot of original reporting and research.

While this type of story is often newsworthy, journalistically, a lot more can be done with chemical right-to-know data.

Reporting the National Overviews

Some of the most worthwhile reporting that has been done with TRI data has tried to present a national survey or overview (much like the TRI annual report itself, but with less governmentese and some journalistic value-added).

While this type of story may be more typical for national media, it can also help local reporters put their own community's situation in perspective.

A classic of the genre was a story by John Holusha, published October 13, 1991, in the New York Times. It took a full page (albeit page 10) and was loaded with graphics.

At the top of the page was a huge U.S. map under the head: "The Nation's Polluters -- Who Emits What, and Where."

Individual counties were shaded darker according to the size of their volume of toxic releases. Smaller maps showed which states had the greatest air and water releases. Bar graphs illustrated "The 10 Biggest Polluters," as well as the top 10 polluters for water and air. The story named individual companies and featured their corporate logos.

The point of the story was that TRI data were having a "powerful impact on corporate behavior." That was not simply because companies wanted to avoid the top-10 lists and the glare of publicity.

The story reported that investor groups were using TRI data to screen companies for their portfolios and that companies were changing practices they had defended as benign simply to avoid negative appearances.

Another classic national take-out was the 3-day "cover story" series that began July 31, 1989, in USA Today.

USA Today reporters Rae Tyson, Julie Morris, and Denise Kalette did their own analysis of EPA's data tapes. USA Today's anecdotal lead quoted a Port Arthur Texas woman and made clear that the data only confirmed something her nose already told her -- that her county, thick with oil refineries, was one of the most polluted by toxic releases in the nation.

The story broke down the toxics "budget." Graphics showed where major quantities originated and where they went. It also itemized data listings for the top 500 counties in the United States. The story included "top-10" of companies and plants. It also included sidebars itemizing the requirements of EPCRA and profiling the most common hazardous chemicals.

Some of the most revealing news came not from the data, but from USA Today's original reporting. The reporters surveyed 20 towns with the largest toxic emitters and found that only 4 had trained HAZMAT teams.

In addition, many of the HAZMAT teams could not get into plants, even in an emergency, unless invited. USA Today found many communities had little emergency preparedness -- mostly because local firefighters lacked information.

Reporting on Chemical Hazards in the Community

These examples only scratch the surface of what journalists can do with chemical right-to-know data. The data can be a starting point for all kinds of investigative and enterprise stories.

Chapter 3: The Emergency Planning and Community Right-to-Know Act: Key Provisions

EPCRA, according to EPA, "makes citizens full partners in preparing for emergencies and managing chemical risks." EPCRA has two basic purposes: (a) to encourage planning for emergency response to chemical accidents and (b) to provide local communities with information about possible chemical hazards. The law operates through provisions in four major sets of sections.

- Emergency Planning provisions (Sections 301-303) require state and local efforts to develop emergency response and preparedness capabilities based on chemical information provided by industry.
- Emergency Release Notification provisions (Section 304) require immediate emergency notification to state and local authorities when one of the hundreds of chemicals designated as hazardous under EPCRA or Superfund is accidentally released to the environment.
- Hazardous Chemical Reporting provisions (Sections 311-312) require all businesses to submit information on chemicals broadly defined as "hazardous" to local and state emergency planners and local fire departments.
- Toxic Chemical Release Reporting and Inventory provisions (Section 313) require certain manufacturers to file an annual inventory of chemical releases with EPA and state agencies.

What Is a SERC?

A SERC is a commission appointed by the governor of each state to serve as the main source of EPCRA authority and as a source of information for anyone interested in the emergency planning process. A SERC may be a newly-formed entity or one or more existing state agencies, such as the environmental, emergency, health, transportation, commerce, and other relevant agencies.

Who Serves on a SERC?

The commissions may be made up of members of trade associations, public interest organizations, and others with experience in emergency planning, including representatives of environmental, emergency management, and health agencies. In some states, SERCs consist solely of citizens, with no state representation.

What does a SERC do?

SERCs --

- Divide states into local emergency planning districts
- Appoint an LEPC for each district and help LEPCs and citizens to create effective plans
- Supervise and coordinate the activities of LEPCs and, with LEPCs, establish procedures for receiving and processing public requests for information collected under other sections of the law
- Review local emergency plans annually to ensure such things as coordination across the state
- Receive MSDSs, annual inventories about hazardous chemicals, and notification of accidental releases of hazardous chemicals from facilities

Emergency Planning (Sections 301-303)

Sections 301-303 are designed to help communities prepare for and respond to emergencies involving hazardous substances. Every community in the United States must be part of a comprehensive state emergency response plan.

The governor of each state was required to appoint a State Emergency Response Commission (SERC) by April 1987. A SERC may be housed within one or more existing state agencies, or it may consist solely of individual citizens.

Some SERCs have no state agency representative and are staffed entirely by private citizens. These commissions have been named in all 50 states and the U.S. territories and possessions. Contact information for the SERCs is available on the RTKNET Web site (http://www.rtk.net/lepc), at the EPA Web site (http://www.epa.gov/swercepp/sta.loc.htm), and the National Safety Council's Crossroads Web site (http://www.crossroads.nsc.org).

Each SERC in tum has divided the state into local emergency planning districts and appointed a Local Emergency Planning Committee (LEPC) for each district. The number of "local" committees varies widely from state to state. California has five committees to cover the entire State. New Jersey, on the other hand, has been divided into as many as 588 local committees.

SERCs are responsible for supervising the activities of LEPCs and annually reviewing local emergency plans to ensure uniform coordination throughout the state. Together the SERCs and LEPCs must establish procedures for receiving and processing requests from the public, the media, and others for information collected under other sections of EPCRA.

What is an LEPC?

An LEPC is a local group appointed by the SERC to develop an emergency plan to gather information on chemicals in the community and prepare for and respond to chemical emergencies. It serves as a focal point for the relationship between the EPCRA data and community action.

Who serves on an LEPC?

- Elected state and local officials
- Law enforcement officials, civil defense workers, and firefighters
- First aid, health, hospital, environmental, and transportation workers
- Representatives of community groups and the news media.
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, and small businesses

What does an LEPC do?

LEPCs --

- Receive MSDSs, annual inventories about hazardous chemicals, and notification of accidental releases .of hazardous
- chemicals from facilities
- Based on chemical information from local facilities, develop a local emergency response plan tailored to the needs of the district, then publicize it through public meetings or newspaper announcements, get public comments, and test the plan periodically with emergency drills
- Update the plan at least annually
- Make information available to the public
- Take civil actions against facilities if they fail to provide the information required under Title III
- Serve as a focus for community awareness and action concerning the presence of chemicals in the community

LEPCs are the local groups carrying out the law. To truly represent their communities, LEPCs are required to include the following members:

- Elected state and local officials
- Law enforcement officials, civil defense workers, and firefighters
- First aid, health, hospital, environmental, and transportation workers
- Representatives of community groups and the news media
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, and small businesses

Each LEPC must analyze hazards and develop a plan to prepare for and respond to chemical emergencies in its district. The plan should be based on the chemical information reported to the LEPC by local industries and other facilities dealing with chemicals.

All local emergency plans must --

- Use the information provided by industry to identify the facilities and transportation routes where hazardous substances are present
- Establish emergency response procedures, including evacuation plans, for dealing with accidental chemical releases
- Set up notification procedures for emergency response personnel
- Establish methods for determining the occurrence and severity of a release and the areas and populations likely to be affected
- Establish ways to notify the public of a release
- Identify the emergency equipment available in the community, including equipment at facilities with hazardous chemicals
- Establish a program and schedules for training local emergency response and medical workers to respond to chemical emergencies
- Establish methods and schedules for conducting exercises or simulations to test elements of the emergency response plan

- Identify a community coordinator and facility coordinators to carry out the plan

The focus of emergency planning is EPA's list of "extremely hazardous substances." This list is made up of more than 400 substances EPA has identified as having immediate toxic health effects and hazardous properties.

However, the emergency response plans must address all hazardous materials in the community that present risks to public health and safety, including, for example, widely used fertilizers, preservatives, photographic chemicals, and insecticides.

The list of extremely hazardous substances includes a threshold planning quantity for each substance. If at any time this amount or more of the chemical is present at any facility, the owner or operator must notify the SERC and the LEPC.

Violators of these reporting provisions are subject to civil penalties of up to $25,000 a day for each day a violation continues.

The facility's owners or operators must also name an employee as facility coordinator. He or she participates in the district's planning process. Obviously, this person is potentially a good resource for journalists.

Federal facilities were originally exempt from EPCRA's requirements.

The Bush Administration sought voluntary compliance by federal agencies, but critics said this left too many gaps in coverage.

President Clinton made federal compliance mandatory on August 3, 1993, when he signed Executive Order 12856, Federal Facility Compliance with Right-to-Know and Pollution Prevention Laws.

LEPCs must make most of their information available to the public. They must let their communities know about their emergency response plans by publishing notices and scheduling public meetings.

Their plans must be reviewed annually and updated as needed. LEPCs may be excellent sources of local information for reporters.

Emergency Release Notification (Section 304)

Chemicals covered by this section of the law include not only the 400-plus extremely hazardous substances, but also other hazardous substances subject to the emergency notification requirements of the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA, also known as Superfund).

Some chemicals are on both lists. If a covered substance is released in an accident at a facility or on a transportation route in an amount that exceeds the reportable quantity for the substance, the NRG and the appropriate LEPCs and SERCs must be notified immediately. Notification activates emergency plans.

Initial notification of a substance release can be made by telephone, radio, or in person. If the release results from a transportation accident, the transporter can dial 911 or the local telephone operator to report it.

All emergency notifications must include --

- The chemical name
- The location of the release
- Whether the chemical is on the extremely hazardous substance list
- How much of the substance was released
- The time and duration of the incident
- Whether the chemical was released into the air, water, soil, or some combination of the three
- Known or anticipated health risks and medical attention necessary
- Proper precautions, such as evacuation
- A contact person

As soon as practical after the release, the facility coordinator must submit a written report to both the LEPC and the SERC.

That report must update the original notification and provide additional information about the response actions taken; known or anticipated health risks; and, if appropriate, advice regarding any medical care needed by exposure victims. By law, this information must be available to the public.

Hazardous Chemical Reporting (Sections 311-312)

Under Sections 311 and 312, facilities must report the amounts, locations, and potential effects of hazardous chemicals present above certain specified threshold quantities on their property.

This means essentially any hazardous chemicals they use, handle, or store in significant amounts onsite-whether or not these chemicals are released into the environment.

All companies, whether manufacturing or nonmanufacturing, are potentially subject to this requirement.

They must report this information to the relevant LEPCs, SERCs, and local fire departments. Facilities must report on the hazardous chemicals in two different ways: Material Safety Data Sheets (MSDS) and annual inventories.

Reporting Method One: Material Safety Data Sheets

Under federal laws administered by OSHA, companies are required to keep MSDSs on file for all hazardous chemicals in the workplace.

Companies must also make this information available to employees so workers will know about the chemical hazards they are exposed to and be able to take necessary precautions in handling the substances.

MSDSs contain information on a chemical's physical properties and health effects and on whether it presents hazards in any of the following categories: immediate (acute) health hazard, delayed (chronic) health hazard, fire hazard, sudden release of pressure hazard, or reactive hazard.

The relevant chemicals are those defined as hazardous chemicals under OSHA's requirements-essentially, any chemical that poses physical or health hazards.

As many as 500,000 products can be defined in this way. If hazardous chemicals are present, they must be reported under EPCRA's hazardous chemical reporting provisions.

Facilities must provide new MSDSs when new hazardous chemicals become present at a facility in quantities above the established threshold levels.

A revised MSDS must be provided if significant new information is discovered about a chemical. Once submitted to the LEPC, SERC, and local fire department, the MSDS information is available to the public upon request.

Reporting Method Two: Annual Inventories

Companies must also report on hazardous chemicals by submitting annual inventories to their LEPCs, SERCs, and local fire departments under a two-tier system.

Under Tier I, a facility must (a) estimate (in ranges) the maximum amount of chemicals present at a facility at any time during the preceding calendar year, (b) provide a range of estimates of the average daily amount of the chemicals present in each chemical category, and (c) provide the general location of hazardous chemicals within the facility.

Tier-II information includes more specific information about each substance, including a brief description of how each chemical is stored and the specific storage locations of hazardous chemicals. (For example: A facility stores 500 pounds of benzene in the northwest comer storage room of the warehouse.)

Tier-II reports also must indicate if the reporting facility has withheld location information from disclosure to the public for security reasons, such as protecting against vandalism or arson.

The information reported under Sections 311 and 312 generally must be made available to the public. The public and reporters can gain access the MSDSs and annual inventory reports for particular plants or areas by contacting the LEPC or SERC.

The LEPC or SERC must respond within 45 days to written requests for Tier-II information. The state commissions may require additional information under state law. Companies may also provide it directly upon request.

Congress gave companies the choice of filing Tier I or Tier II, unless the SERC, LEPC, or fire department requests Tier-II information.

EPA, in its own words, "believes that Tier-II reports provide emergency planners and communities with more useful information, and is encouraging facilities to submit Tier-II forms."

Toxic Chemical Release Reporting and Inventory (Section· 313)

The fourth key element of EPCRA is a requirement that certain manufacturing plants report annually on the amounts of extremely hazardous substances they release into the air, water, or soil.

This provision applies to more than 31,000 facilities with 10 or more employees. Companies with nine or fewer employees are exempt from Section 313. Toxic chemical release reports are required from facilities that use more than 10,000 pounds of a listed chemical in a calendar year or that manufacture or process more than 25,000 pounds per year.

Many companies have long been required to report data on chemical emissions to EPA and the states under other environmental laws such as the Clean Air Act, the Clean Water Act, and the Resources Conservation and Recovery Act.

What makes the annual toxic chemical release reporting requirement different, and particularly useful, is that estimated releases of a specific chemical to air, water, and land appear on one form and that the public and press have direct access to the data.

Facilities must annually file a Toxic Chemical Release Inventory Form (Form R) that estimates the total amount of each chemical they (a) release into the environment (either by accident or as a result of routine plant operations) or (b) transport as waste to another location.

A complete Form R must be submitted for each chemical. Releases covered include air emissions from stacks, liquid waste discharged into water, wastes disposed of in landfills, and wastes transported offsite to a public or private waste treatment or disposal facility.

Routine exposure to many of the chemicals covered by this section of the law poses long-term (chronic) health and environmental hazards, such as cancer, nervous system disorders, and reproductive disorders.

Among the most commonly used substances included on the list of the approximately 400 chemicals are ammonia, chlorine, copper, lead, methanol, nickel, saccharin, silver, and zinc.

The following information must be estimated and reported by manufacturers for these reports:

- The toxic chemicals released into the environment during the preceding year
- How much of each chemical went into the air, water, and land
- How much of each chemical was transported away from the site of the facility for disposal
- How the chemical wastes were treated onsite
- How efficient that treatment was

These reports must be submitted to EPA and the SERC by July 1 of each year and cover releases in the previous calendar year.

EPCRA set a precedent for increased public access to federal information by requiring EPA to compile these reports into the national computerized TRI database and make it available to the public.

EPA originally put the TRI database online in 1989 through the National Library of Medicine's TOXNET. It is now available through EPA's Envirofacts Warehouse, on CD-ROM, and through the RTKNET and Chemical Scorecard Web sites.

Trade Secrets: The One Exception (Section 322)

Under Section 322, companies reporting under EPCRA, under very limited conditions, can request that the specific identity of chemicals in their reports not be disclosed to the public.

This section takes a very cautious approach to allowing claims of trade secrecy, requiring that companies state and justify their claims up-front, rather than allowing the claims and then making them subject to challenge after-the-fact.

In addition, Congress specified in the law that a company claiming a trade secret must be able to prove that the withheld information is not subject to disclosure under any other federal or state law and that it is a legitimate trade secret-that disclosure could substantially damage the company's competitive position.

The chemical's identity must be included in the company's reports.

Furthermore, the organization claiming trade secret protection must demonstrate that it has taken reasonable measures to protect the confidentiality of the information and that it intends to continue taking such measures.

Once such a trade secret claim is withheld, information beyond the specific chemical identity will still be available to the public. Information (e.g., about the general category of the chemical) that will disclose the environmental and health effects of the chemical must be included in the public version of the reports, even after a trade secret claim has been approved.

Citizens may challenge a trade secret claim by filing a petition with EPA requesting disclosure of the chemical.

Enforcement Provisions (Section 325)

Companies that fail to comply with EPCRA's key provisions (emergency planning, emergency notification, and reporting requirements) face civil, administrative, and criminal penalties under the Section 325 enforcement provisions of EPCRA.

Violations of the law's emergency planning and emergency, response requirements under Sections 302(c) and 303(d) are subject to potential civil penalties of as much as $25,000 daily.

Once the accused is given notice and an opportunity for a hearing on the alleged violation, a civil penalty of up to $25,000 can be assessed for a violation of the Section 304 emergency notification requirements. Second and subsequent violations can draw fines of up to $75,000 for each day the violation continues.

Those found guilty of knowingly and willfully failing to provide Section 304 emergency notification reports on extremely hazardous substances under EPCRA or hazardous substances under CERCLA released from their facility face penalties, once convicted, face fines of up to $25,000 or imprisonment for up to 2 years.

These penalties are doubled for second or subsequent criminal convictions.

Section 325 authorizes civil penalties of up to $25,000 per violation for failure to meet Section 312 or 313 provisions for hazardous chemical inventory release forms. A finding by the EPA administrator that a trade secret claim is insufficient and frivolous can bring an administrative or judicial penalty of $25,000 for each such claim.

Also, a person who knowingly and willfully divulges or discloses information entitled to trade secret protection under the law can be fined up to $20,000 or imprisoned for as much as one year.

As is generally true under the environmental statutes, individual citizens have the authority to bring civil suits. They can sue a facility for (a) alleged failure to submit emergency notices, (b) failure to submit an MSDS or list of chemicals under Section 311, (c) failure to complete and submit a Section 312 inventory form, or (d) failure to submit a Section 313 toxic chemical release form.

Chapter 4: The 1990 Clean Air Act and the Risk Management Program

The next generation of chemical right-to-know was born when Congress passed a comprehensive and long-awaited set of amendments to the Clean Air Act and the president signed them into law on November 15, 1990.

Provisions under .the heading of hazardous air pollutants pushed chemical safety in the United States a major evolutionary step forward-moving the emphasis beyond merely reporting hazardous chemical releases to preventing them in the first place.

The new programs dovetailed with and added to EPCRA. In fact, these propositions had originally been proposed as part of EPCRA but were not adopted by Congress in 1986.

The CAA created a new Risk Management Program that expanded what facilities (formally known as stationary sources) were required, to disclose. It also required facilities to analyze hazards and show what they were doing to reduce hazards.

The law created the independent CSB as an aggressive watchdog· that not only would do post-mortems on chemical accidents, but would also push EPA and OSHA to reduce hazards.

Finally, the law required OSHA to issue rules to ensure the safety of industrial chemical processes.

The risk management program language in the CAA was really only a skeleton of the program, and Congress quite deliberately left it to EPA to fill in most of the details by regulation.

EPA took 6 years, until June 1996, to issue the main rule implementing the program. Another 3 years passed before the RMP Rule became effective. And the story is still unfolding.

Congress enacted the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act in August 1999 with the primary focus of limiting public access to key right-to-know data collected under the RMP Rule.

Risk Management Program of the Clean Air Act Citations

The CAA Amendments of 1990 were enacted as P.L. 101-549, and chemical accident prevention requirements were codified as 42 U.S.C. 4712(r).

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act was codified as P.L. 106-40.

The Risk Management Program of the 1990: Clean Air Act: A Summary

The General Duty Clause

The owner or operator of a plant producing, using, handling, or storing hazardous substances has a general duty to design and maintain a safe facility, to prevent accidental releases, and to minimize the consequences of any releases that occur.

The duty applies to plants handling any extremely hazardous substance, regardless of whether it is specifically listed by EPA under this law. The general duty clause was intentionally written quite broadly.

It requires facilities to know the hazards of the chemicals they use; to maintain a safe workplace by incorporating the industry's best practices, codes, and standards; and to develop an emergency plan.

The List of Covered Substances

Under the law, the EPA administrator was required to issue a rule listing at least 100 extremely hazardous substances subject to the requirements of the Risk Management Program.

The law specified 16 chemicals required to be on the initial list and specified that the administrator use the list of extremely hazardous substances under EPCRA as a starting point for the RMP Rule list. The administrator can revise the list. Citizens and industry can also petition EPA to revise the list.

In listing substances for the Risk Management Program, the EPA administrator must consider the severity of harm to health that their release could cause, the likelihood of an accidental release, the severity of any acute adverse health effects, and the potential magnitude of human exposure.

On January 31, 1994, EPA promulgated its first version of the regulation and the list of regulated substances and thresholds for "accidental release prevention," often referred to as the List Rule.

That regulation identified the substances to be regulated though the Risk Management Program. The first version included three substance categories: toxics, flammables, and explosives.

On June 20, 1996, EPA published modifications to the List Rule, exempting from compliance several types of processes and "stationary sources." All were related to petroleum processing.

The List Rule was further modified on August 25, 1997, when EPA published its decision to exempt hydrochloric acid solutions with less than 37% concentrations of hydrogen chloride.

What Is a Process?

A process is defined as manufacturing, sorting, distributing, handling, or using a regulated substance. Chemicals in transit, including pipelines, are excluded.

Responding to concerns raised by regulated industries, the explosives category of substances was exempted when EPA published a revised Final Rule on January 6, 1998.

That action also exempted the thresholds of flammable substances in gasoline used as fuel and in naturally occurring hydrocarbon mixtures before initial processing.

On May 21, 1999, one month before the RMP Rule went into effect, EPA Administrator Carol Browner signed a stay of the effective date for facilities with no more than 67,000 pounds of certain hydrocarbon fuels (e.g., propane, butane, ethane) not used as feedstock for a process.

This action is particularly significant since more than 40% of the more than 66,000 facilities expected to be regulated under the RMP Rule were now exempted. The current list of substances and their thresholds is available on EPA's Web site (http://www.epa.gov/ceppo/caalist.html).

Regulations for Accident Prevention

The EPA administrator is authorized to issue regulations for preventing, detecting, and correcting accidental release of listed substances. The regulations may require monitoring; recordkeeping; reporting; training; vapor recovery; secondary containment; and other design, equipment, work practice, and operational requirements. The administrator may set different requirements for different classes of facilities considering factors such as size, location, substances handled, and emergency response capabilities.

The administrator must issue regulations to provide for emergency response to accidental releases by plant operators and owners. EPA must consult with the Departments of Labor and Transportation to minimize potential conflict among regulations. The regulations must cover the use, operation, repair, replacement, and maintenance of equipment used to monitor, detect, and control releases. Regulations must include procedures for training personnel and inspecting plants, and they must cover storage as well as operations. Plants have 3 years after the regulations are issued to comply or 3 years after they begin using a listed substance, whichever is later.

Risk Management Plans

Owners or operators of plants where listed substances are present in quantities above the threshold are required to prepare and carry out RMPs. The plans must include the following for each process:

- A hazard assessment of the potential effects of a release that includes estimates of potential release quantities, downwind effects, and exposure of populations; a 5-year history of releases (size, concentration, and duration); and an evaluation of worst-case scenarios
- A program for preventing accidental release of listed substances, including safety precautions, maintenance, monitoring, and employee training
- A program of specific actions to be taken in response to an accidental release to protect human health and the environment, including procedures for (a) informing the public and local HAZMAT responders, (b) emergency health care, and (c) employee training

The law states that the plans "shall be available to the public," except for information qualifying as trade secrets.

EPA can regularly audit, review, and require revisions to ensure RMPs comply with the law. EPA can require the plans to be updated immediately upon any change in the facility's processes. Otherwise, the update cycle is every 5 years. States, territories, tribes, and local governments may adopt chemical risk management requirements in addition to the EPA program. However, these requirements cannot be less stringent than those specified under the CAA.

State and Local Risk Management Program Implementation

States can choose to take delegation of the CAA Risk Management Program. If a state is granted delegation, it then becomes the implementing agency for that jurisdiction. If it does not take delegation, the EPA regional office is the implementing agency. Reporters should contact their SERC or the EPA to determine who is managing the RMP program in their area.

As of January 2000, Florida, Georgia, Puerto Rico, Ohio, the Virgin Islands, and Forsyth County, North Carolina, had obtained delegation. Fourteen other jurisdictions, including California, Kentucky, Louisiana, New Jersey, and Allegheny County, Pennsylvania, were seeking delegation.

The Chemical Safety and Hazard Investigation Board

The law establishes the CSB. The board is independent, that is, not under the jurisdiction of another federal agency. The CSB consists of five members appointed by the president with the approval of the U.S. Senate.

The CSB is fundamentally a research and investigative organization. It has no regulatory authority, with the sole exception of being able to establish requirements for reporting accidental releases. Otherwise, the job of the board is to --

- Investigate, determine, and report to the public the circumstances and causes of any accidental release resulting in death, serious injury, or substantial property damage
- Issue periodic reports with recommendations on how to reduce the likelihood and consequences of accidental releases in chemical production, processing, handling, and storage
- Investigate the potential for hazardous releases, even when they have not yet occurred

The board must submit an annual report to the president and the Congress detailing all accidental chemical releases reported and investigated during the previous year along with any recommendations for legislative or administrative action. To facilitate the board's ability to investigate incidents, its findings and recommendations cannot be used as evidence in civil damage lawsuits arising out of any matters it investigates.

The OSHA Process Safety Management Standard

In Section 304(a), the CAA mandated another part of a holistic program for preventing hazardous chemical releases. Closely interwoven with the RMP Rule is a regulation issued by OSHA titled Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119), known as the Process Safety Management (PSM) Standard. OSHA issued the final rule on February 24, 1992. It became effective on May 26, 1992, although portions were stayed until August 26,

1992. PSM's list of regulated substances (termed highly hazardous chemicals) differs somewhat from those regulated under the RMP Rule. The PSM Rule and the list of highly hazardous chemicals and their thresholds (See appendix A of the standard) can be found on OSHA's Web site (http://www.osha.gov).

Three Levels of Stringency

The RMP Rule divides regulated facilities into three program focuses according to the level of potential danger they may present to surrounding communities.

The requirements the rule imposes on facilities become progressively stricter as the danger increases.

In the regulatory jargon, these categories are called Program 1, Program 2, and Program 3-with Program 1 being the least dangerous and Program 3 being the most dangerous.

Program 1

Program 1 requirements apply to plants (or processes) that meet three conditions:

- The plant has had no accidental releases in the past 5 years that led to offsite death, injury, or environmental cleanup.
- The worst-case toxic plume or fire hazard would not reach a populated area.
- The plant has coordinated emergency response procedures with local agencies.

Generally, Program 1 facilities are relatively simple operations or are quite distant from the property line.

Facilities with Program 1 processes are required to .do little more than document that they qualify for Program 1. They must analyze a worst-case release scenario and document that the danger of injury from toxics and fire will not reach the nearest populated area. They must compile a 5-year accident history showing no serious offsite effects. They must ensure that they have coordinated emergency response plans with local agencies. Then they must certify that they meet the qualifications for Program 1 and that no additional measures are needed to prevent offsite impacts.

Program 2

Program 2 requirements apply to processes that fall into neither Program 1 nor 3. Generally, they are processes of low complexity and do not involve chemical reactions. Program 2 RMP responsibilities include the following:

- Describe how their RMP management systems will be implemented
- Conduct hazard assessments, which includes analyses of worst-case and alternative release scenarios
- Establish emergency response programs that include plan's to inform the public and emergency response organizations about the chemicals onsite and their health effects and strategies to coordinate those plans with the community

Unlike Program 1 processes, those in Program 2 must report steps taken to prevent incidents that can release dangerous chemicals. The requirements of the prevention program are less stringent than those for the potentially more dangerous Program 3 processes. Some safety professionals view the Program 2 prevention requirements as a "lite" PSM program.

Program 3

Program 3 requirements apply to processes that do not fall into Program 1 and meet either of two conditions:

- They fall into at least one of nine specified SIC Codes (amended on January 6, 1999, as 10 NAICS Codes). These NAICS codes include pulp mills (32211), petroleum refineries (32411), petrochemical manufacturing (32511), alkalis and chlorine manufacturing (325181), basic inorganic chemical manufacturing (325188), cyclic crude and intermediate manufacturing (325192), basic organic chemical manufacturing (325199), plastics material and resin manufacturing (325211), nitrogenous fertilizer manufacturing (325312), and pesticide and agricultural chemical manufacturing (32532).
- They are subject to OSHA's PSM Standard.

Generally, Program 3 processes pose higher risks and involve complex chemical processing operations. As with Program 2 processes, facilities in Program 3 must (a) describe their systems for managing implementation of their risk management program, (b) conduct hazard assessments, and (c) establish emergency response programs. The prevention program requirements for Program 3 are nearly identical to those of OSHA's PSM Standard. These facilities must conduct a more formal, complex Process Hazard Analysis (PHA).

The Contents of a Risk Management Plan

The Offsite Consequence Analysis

An RMP must contain a hazard assessment, one part of which is an OCA. The OCA estimates what offsite harm to human health or the environment might be caused offsite if a release occurred. Release in this context is a fairly broad term. It could mean a leak of a toxic gas or liquid, whether sudden or gradual, that drifted or flowed offsite. It could also mean a fire or explosion and the shock wave from the explosion or the heat offsite from the fire onsite.

Facility owners and operators must fully document their offsite consequence analyses and must update them at least every 5 years or within 6 months of a change that would double the distance to endpoint.

What Is An "Endpoint?"

The RMP Rule uses the term endpoint in prescribing how offsite consequences should be performed. Although it is a rather obscure bit of technical jargon, reporters trying to understand an RMP will need to understand the term. Imagine a railroad tank car leaking green chlorine gas and a long plume (cloud) of that lethally toxic gas drifting steadily for miles downwind. A lay person might think of the "endpoint" of that toxic plume as the point at which it is no longer toxic. It's a useful image, although hazard analysts use the term in a sense that is a little more complex.

To say when that chlorine plume ceases to be toxic. Requires us to make a somewhat arbitrary definition of what we mean by toxic. Let's say, just for illustration, that the plume is toxic as long as it can cause some lasting harm to human health. Toxicologists have determined (with experience, experiments, and lab rats) what concentrations of chlorine (and what human exposures to them) cause lasting harm to human health. That concentration is a number – a number below which some standard human exposure will not result in lasting harm to health. With regard to the OCA, EPA hazard analysts have come to call the numerical value itself an endpoint.

People can and do argue about what the right number is. There are all sorts of standards for choosing it, but that is beside the point here. For the purposes of the RMP Rule; EPA has solved the problem by decree (although not arbitrary decree), setting the endpoints for certain hazards by regulation. The RMP Rue specifies endpoints for flammables, explosion, radiant heat, and a list of specific chemicals (given as concentrations).

So when the RMP Rule speaks of “the distance to a toxic or flammable endpoint for a worst-case release assessment” being “less than the distance to any public receptor," you will be ready to translate for your audience.

Receptors

The regulations define a public receptor as offsite residences; institutions (e.g., schools, hospitals); industrial, commercial, and office buildings; parks; or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxics. RMPs must estimate at-risk populations, including residential populations; schools; hospitals; and major commercial, office, and industrial buildings.

RMPs must also list "environmental receptors" within these circles-natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and federal wilderness areas.

The Worst-Case Scenario

A worst-case scenario is based on the assumption that if anything can go wrong, it will. Worst-case chemical accidents are the most catastrophic in terms of human death and injury, and they are exactly the kind of accidents planners want to prevent. But they cannot be prevented unless they can be imagined. This exercise – so essential for public health and safety-has the paradoxical effect of making people feel very unsafe. That may be healthy if it motivates people to take action to prevent accidents.

This presents something of a challenge to reporters. Catastrophe stories are easy to get on the front page-even imaginary catastrophes. They are very tempting when all that matters is higher ratings and readership. But journalists who think their job is to offer some objective view of reality may want to give readers, listeners, and viewers a sense of the low probability of some of the worst imaginable catastrophes.

Worst-case release scenarios, as called for in the RMP Rule, ask what would happen if everything went wrong all at the same time. They make all the most unfavorable possible assumptions about the conditions under which an accident could occur.

For example, the rule requires analysts to assume that the tank containing a hazardous substance is completely full, that it is released in a very short time (e.g., 10 minutes), and that it is a very hot day (which makes chemicals evaporate or volatilize faster).

Alternative Scenarios

Program 2 and 3 facilities must also analyze alternative scenarios as part of their RMPs. They must analyze at least one alternative scenario for each listed toxic substance and another alternative scenario for flammable substances. They must choose scenarios that are more likely to occur than the worst case and that will still (if possible) pose hazards off site.

Alternative release scenarios may include far more common, and realistic, failures: split hoses, broken pipe welds or valve seals, spills from overfilled vessels, venting through pressure relief valves, broken shipping containers, and the like. And alternative scenarios may include the effect of process safety features: automatic shut-off valves to stop release and deluge systems to put out fires, for example.

The Five-Year Accident History

The RMP must also include a history of all accidental releases in the previous 5 years that resulted in deaths, injuries, or significant property damage onsite or known offsite deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.

Events in the accident history of the process may serve as a basis for alternative release scenarios. Unless effective corrective action is taken, history may repeat itself. Investigate whether these contributing conditions, if uncorrected, led to a more serious outcome than the RMP's reported alternative scenarios.

Prevention Programs

While all facilities have a general duty to operate safely, the RMP Rule requires Program 2 and 3 facilities to carry out very specific accidental release prevention programs. The requirements for Programs 2 and 3 are similar in many ways, but they are generally more stringent for Program 3. The prevention program must be documented in the RMP, and where it consists of actions, the RMP will include information about actions to be taken. EPA audits this information, but the overarching strategy of the chemical safety program is one that relies on information (rather than command-and-control regulation) to achieve action. So it is very much incumbent upon reporters and people in communities to examine the prevention program information in the RMPs and ask the right questions about it.

Program 2 and 3 prevention programs are required to include the following:

- Safety Information: Information should include MSDSs; equipment inventory; safety limits for temperatures, pressures, flows, and compositions; equipment specifications; and design codes and standards.
- Hazard Review or Analysis: This review must include identification of the hazards associated with each industrial process, possible equipment malfunctions, or human error that could cause a release, as well as the safeguards needed to manage such malfunctions or errors.
- Operating Procedures: Facility owners and operators must prepare written operating procedures that provide clear instructions for operating each covered process safely.
- Training: Employers at covered facilities must ensure that each employee operating a process is trained and tests competent in the operating procedures.
- Maintenance and Mechanical Integrity: Facility owners or operators must maintain the ongoing integrity of process equipment. This requirement includes setting and carrying out regular maintenance procedures, making sure their own employees and those of contractors are trained in maintaining equipment safely, and maintaining equipment for safety.
- Management of Change and Pre-startup Review: Program 3 facilities must establish and follow written procedures for changes to chemicals, technology, equipment, procedures, and the plant itself that affect a covered process.
- Compliance Audits: Facility owners or operators must certify that they have evaluated their own compliance with the accident prevention program and the RMP Rule (PSM Standard) at least every 3 years.
- Incident Investigation: Owners or operators must investigate each incident that leads to a catastrophic release within 48 hours of the incident.
- Emergency Response Plans: Program 2 and 3 facilities must have emergency response plans that include procedures for informing the public and local emergency response agencies about accidental releases and documentation of first-aid and medical treatment for accidental exposures.

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act

On August 5, 1999, President Clinton signed the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act imposing at least a 1-year moratorium on disclosure of OCA information (sections 2 through 5 of the RMP) concerning potential harm to communities from plants handling hazardous chemicals. The act exempts federal and state Freedom of Information Act disclosures for this period and also exempts rankings of sites based on that data. The act was the culmination of a campaign by the chemical industry and the Federal Bureau of Investigation to limit public access to the OCA data because of concerns about terrorism targeting the most vulnerable communities.

The act also removed flammable fuels (e.g., propane) from the RMP program when the substances are used as fuel or held for sale as fuel at a retail facility. A retail facility is a facility at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program. The basis for the exemption was that laws and regulations covering flammable fuel and propane dealers are adequate. EPA estimates that the act reduced the number of regulated facilities from more than 60,000 to approximately 30,000.

By August 5, 2000, the federal government must assess the security risks of posting OCA data on the Internet against the benefits of public access to that data. In the meantime, EPA will make all RMP data, including the OCA, available to federal, state, and local officials, including LEPCs, for emergency planning and response purposes. Qualified researchers can also have access to the data. However, EPA has not yet defined who is a qualified researcher. All of these persons are prohibited from publicly releasing OCA data unless the data have already been publicly released by the facility.

Within 180 days of enactment, larger facilities must hold public meetings describing local hazards and provide a summary of their OCA information. The remainder of the RMP data are available on RMP*Info™ and other sources. Much of this information is still important and valuable for investigating local chemical hazards. For example, both RMP*Info™ and RTKNET are publishing the RMP executive summaries. Many of the summaries include the actual worst-case and alternative scenario data that are prohibited from disclosure if it is in sections 2 through 5 of the RMP. Information on chemical facilities, their location, their chemical inventories, and nearby population characteristics is also available. These are the key data elements needed for determining worst-case scenarios.

Chapter 5: Reporting on Chemical Emergency: Prevention and Preparedness

Wherever you are, there are probably dozens of good stories waiting to be written on chemical emergencies -- before they happen.

The RMPs for individual facilities are an obvious story opportunity. But once you cover the plans, don't presume the story is finished. The RMPs will really be just the beginning of a story. What they leave out may be as important as what they contain. RMPs give the press and the community a chance to ask some really key questions and give companies or facility operators a chance to give some really good answers. Some facilities may provide stories by themselves or there may be stories to write about groups of facilities (for example farm supply dealers in rural areas).

The information that the RMP Rule requires companies to submit to EPA (and EPA to make public) is only a fraction of the safety analysis companies are actually required to perform. Reporters and citizens have every right to ask companies to make more information public, and companies have a right to say no. How companies respond may itself be informative.

Other sources of information are reports under EPCRA and the OSHA PSM and Hazard Communication Standards. The PSM Standard covers a wider range of flammable and toxic substances than the RMP Rule does. It also covers explosives, which are not covered by the RMP Rule.

Under the PSM Standard, companies are required to give information only to employees, not to the general public. But nothing prevents employees from sharing that information with reporters. You may find that local labor union officials working on occupational safety and health issues are very good sources of information.

Another potential source of stories is information available under air and water permitting programs, hazardous waste handling and cleanup regulations, and hazardous substance transportation regulations. Also, states such as California and Oregon have their own chemical safety requirements.

Looking at Risk Management Plans

After a facility has filed, or "registered," an RMP, you can get the summary information from EPA through RMP*Info™ (http://www.epa.gov/enviro) fairly quickly. Another source for RMP executive summaries is RTKNET (http://www.rtk.net).

Once you get the summary of the RMP, visit your LEPC or SERC and ask them for the complete plan for some restrictions on what they can distribute). If your LEPC or SERC has no more information than EPA's RMP*lnfo™, call the company and ask them for the plan. If they are not willing to share it, ask them why not.

Program Classification

One of the very first things you want to look at when you get the RMP information on a facility is how it has classified its regulated processes -- as Program 1, 2, or 3. Although most processes are likely to be properly classified, you might want to check the basis for the facility's self-classification.

Hazard Assessment

Accident prevention begins with analyzing operations to identify equipment and procedure failures that could lead to unplanned spills and releases. Ask specifically to see as much as you can about the hazards revealed when the process was evaluated. The RMP Rule requires facilities With Program 3 processes to conduct a PHA. Program 2 processes, which are generally less complex than Program 3 processes, also must identify potential failures, but a formal PHA is not required. PHAs identify areas where improvements can be made in system design, operating procedures, training, and other incident prevention strategies. This is a critical step leading to the OCA. If all the potential hazards are not identified, then the potential effects cannot be analyzed.

Ask who performed the PHA or assessment. Ask what their qualifications are or were. Ask the company to give these people clearance to talk to you. Bring your own experts to review the analysis. The rule requires that the PHA be done by a team with professional competence in this field.

The Offsite Consequence Analysis

Also ask to see the OOA. This is the part of the plan that will probably get the most media attention. It is the part that speaks most directly of potential dangers to people and the part that is most controversial.

The OGA is one of the key tests that determine whether a process qualifies as a Program 1, 2, or 3 process. If the worst-case toxic plume or fire would not reach the nearest populated area, the facility may qualify as Program 1. Companies will want to qualify for the simpler Program 1 reporting and may have a motivation to minimize reportable hazards. So it is important that the OCA is done correctly.

A more important reason to examine the OCA is that the lives, health, and property of your readers, listeners, or viewers may be at risk. Whether a toxic cloud could reach 5 or 10 miles into a populated neighborhood can mean a great deal to people living in the area.

How do you know whether the OCA is done right? Find some experts to help answer that question. The accuracy of the OCA will depend on certain basics that you can examine. One basic is which chemical is involved and the maximum quantity of it expected to be stored in one place onsite-information reported in the RMP. A second basic is the model that simulates air dispersion of the substance (or fire or explosion). Facilities can use the model under RMP Rule, called RMP*Comp, available on EP.Ns Web site. They can also use the lookup tables in the RMP guidance. A third basic is the set of assumptions that went into that model (e.g., the temperature of the chemical, how fast it was released and for how long, weather conditions). These are prescribed by the RMP Rule to some degree, particularly for the worst-case scenario. For more discussion of how an OCA works, see chapter 4.

As a local reporter, you probably have special expertise on one key element of the RMP's OCA-the description of the surrounding populations that might be affected by a release, fire, or explosion at the plant.

The OCA is supposed to contain a description of these populations. Check its accuracy and completeness. Is the population estimate within the circle drawn around the plant accurate?

Are any schools, nursing homes, or other vulnerable facilities left out? Are office buildings or shopping malls found nearby? Could the area be evacuated quickly?

The Five-Year Accident History

Another key element of the RMP is the 5-year accident history. To qualify for Program 1, a facility must have had no releases in the last 5 years that led to offsite death, injury, or environmental cleanup.

The accident history can tell you a lot about the potential dangers a plant poses. If the history in the RMP is accurate, it will check out in interviews with workers, unions, neighbors, and local officials, as well as your own newspaper morgue or database. Also, if incidents have occurred, they may show up in one of the HAZMAT incident databases.

Multiple Processes in One Facility

Most of the RMP requirements apply not to the plant itself, but to one or more processes within the plant. OSHA defines (and the RMP Rule accepts) a process as

> any activity or combination of activities including any use, storage, manufacturing, handling or the onsite movement of highly hazardous chemicals. A process includes any group of vessels that are interconnected and separate vessels located such that a highly hazardous chemical could be involved in a potential release.

While a fertilizer dealer may have only one regulated process, a large chemical plant may have dozens of processes. It is important to look systematically at all of the regulated processes within a plant, because any one could prove hazardous.

Natural Hazards

Consider what natural hazards might cause or add to dangers at your local plant. Some natural hazards are probably more likely to occur in your area. Is the plant near an earthquake fault? Pipes or tanks ruptured by a minor quake could be a major problem. Is it located on a flood plain? Propane tanks floated away by floodwaters are a common hazard (they need to be securely anchored). Lightning is a fairly common cause of fires, explosions, and releases. Has your plant taken measures to arrest lightning in vulnerable areas? Hurricanes, tornadoes, flood, drought, heat, and cold are among the other natural hazards to consider.

Power Supply and Computer/Communications Systems

Ask about the computer systems controlling the processes. Especially when hazards are involved, the systems they control should be designed to be fault-tolerant. That is, if the computer crashes or makes a mistake, the system should naturally revert to a safe condition. Think of the "dead man's throttle" on a locomotive. If the computers controlling valves at your plant fail, will the valves be closed or open? How old is the computer hardware controlling safety-critical systems at the plant? Has the software been updated recently to reflect new knowledge about safety and how the computer and mechanical systems can fail?

Consider, too, the possible consequences of the failure of electric power supply or telephone and telecommunication links that support the plant. What safety systems depend on electric power? For example, does the plant store liquids that remain safe only when refrigerated? Is there backup power for refrigeration?

If a chemical accident does occur, the plant may well rely on telephones to call for emergency help or to warn the community. What happens if an explosion knocks out the phone lines? How well are backup systems maintained, and how often are they tested? Hazard analysis is supposed to include such considerations. Has it? Accidents Waiting to Happen by U.S. Public Interest Research Group (USPIRG) and Y2K Readiness of Small and Medium Size Enterprises by the Mary Kay O'Connor Process Safety Center at Texas A & M University are two recent studies that analyze the potential relationship between computer problems and hazardous chemical releases.

Accidents Waiting to Happen can be downloaded at no charge from USPIRG (http://www.pirg.org/chemical). Y2K Readiness of Small and Medium Size Enterprises can be downloaded at no charge (http://process-safety.tamu.edu).

The Prevention Program

Probably the most important part of the RMP is not the account of what could go wrong, but the account of what is being done to keep it from going wrong (figure 7). While hardly the most exciting part of the document, prevention may be the part where journalistic and public scrutiny is most needed. The RMP Rule and the PSM Standard require facilities to prepare, document, and carry out an accidental release prevention program that includes the hazard review described earlier. Facilities must also compile an array of safety information that includes MSDSs, equipment inventory, safety limits for operating conditions, and many other things.

As with other parts of the RMP, facilities are not legally required to show you the full information. But if they are doing a good job at accident prevention, they should be proud and eager to share this information with the press. Facilities are, however, required to share the information with employees. So if the company denies you information, you may be able to get it from employees.

Even the information that is publicly available can give you a handle. It can lead to questions about whether the company is following through on its prevention program. Many of the prevention programs have existed for some time because they are required under the PSM Standard.

RMP Versus LEPC Emergency Plans

A very handy tool in evaluating your local plant's safety and its RMP is the emergency plan developed by your LEPC under EPCRA. Conversely, the RMP may help you evaluate the local emergency plan. Is the information consistent? Are there hazards and risks mentioned in one but missing from the other? If an emergency occurs at the plant, will the plant's operators be effective in coordinating with community institutions that need to respond? Is your LEPC updating its plans in light of new RMPs?

Looking for Prevention Measures Beyond those Required

A good accident prevention program may well include elements not required by law. Look for these. Ask the company if it has looked for other opportunities to improve safety and implement changes. Environmental groups often emphasize that the intrinsic safety of an operation can be improved by fundamental design changes (e.g., switching to safer chemicals). Drinking water purification plants in many cities use chlorine to disinfect the water, and multi-ton tanks of chlorine are a serious hazard. Although proper handling makes accidents rare, toxic plumes from a release can injure or kill people miles away. Some cities have substituted sodium hypochlorite for chlorine, because it is intrinsically much safer. Sodium hypochlorite is the ingredient in old-fashioned laundry bleach.

Engineers may be able to find many other ways to build in safety. In some cases, companies can reduce risk by limiting their inventory of hazardous chemicals to the supply they will use quickly, rather than storing large quantities. Some chemicals can be handled at pressures closer to atmospheric pressure, thus reducing the speed of release if a leak occurs. Also, some chemicals can be handled at temperatures closer to the surrounding outdoor temperatures so that refrigeration failures need not raise the danger of a release. Ask independent process safety engineers what opportunities to reduce risk may exist. Ask the company if it has looked for such opportunities or carried out such changes.

Writing a Story: Questions to Consider

Questions for Plant Managers

- How dangerous are the chemicals you reported under the RMP? How toxic, flammable, or explosive are these chemicals?
- Have toxicity or exposure studies been conducted on these chemicals? Have credible scientists verified these studies?
- How reactive are these chemicals to water, heat, or other substances? Could this reactivity result in an explosion or create another dangerous chemical?
- What are you doing to reduce hazards (for example, reducing chemical inventories; substituting less hazardous chemicals; improving process design, training, or management controls)?
- What is the scope of chemical safety and emergency response training for employees and contractors? How do you know the training has been effective?
- Who is in charge of safety? What are their names and duties?
- How often does the facility conduct emergency response drills? When was the most recent one? How did it go? What was learned?
- If a release occurred, how would it be detected and who would be notified?
- Does the facility have warning sirens or other mechanisms to alert the community of dangerous releases? Do workers and neighbors recognize them? When was the last time they were tested?
- Were accident prevention and emergency plans developed internally, or was outside help used? Does the facility use internal audits or independent, third-party checks to evaluate the adequacy of the accident prevention program?
- What air dispersion model was used? If not RMP*Comp, why not? How were scenarios derived? What were the assumptions?
- Describe some of the routine steps taken to ensure safety.
- Describe the steps taken to maintain equipment and operate it safely.
- Does the facility send a representative to the community's LEPC meetings? If so, who? What other efforts have been made to coordinate with the community about safety and emergency response?

- What worries the plant manager and employees the most about safety at the facility? Why?
- If the facility is a chemical manufacturer involved in Responsible Care® (a safety program developed by the Chemical Manufacturers Association), ask engineers at a plant to describe the codes of practice and to give examples of how these practices are implemented.

Questions for the LEPC

- Who is on the LEPC? How often does it meet?
- Does the LEPC have information on hazardous chemical inventories throughout the community available for review?
- Have vulnerable populations (e.g., schools, nursing homes, hospitals, residences) been identified?
- Has the LEPC prepared and kept current site-specific emergency response plans?
- Has the LEPC conducted drills and exercises?
- Has the LEPC developed and communicated evacuation or shelter-in-place strategies?
- Have hazard analyses been integrated into fire and police response plans?
- Does the LEPC have documents of chemicals onsite from EPCRA, RMP, and other regulatory filings? Are the documents consistent?
- How does the RMP worst-case scenario compare to the worst-case scenario developed by the LEPC?
- Have the LEPC's emergency plans been implemented?
- Who would decide on an evacuate or shelter-in-place alert?
- How would the community be notified?

Questions Beyond the RMP

Preventing chemical accidents and preparing for them goes way beyond the RMP. Reporters trying to give their communities a holistic picture of chemical risks and what the community can do to reduce them might well look at a number of other questions:

- What dangerous chemicals do you have onsite that are not listed in the RMP regulation? Can you supply an MSDS or other chemical hazard information?
- Are any new hazardous chemical facilities (or expansions of existing ones) being planned for your community? If so, how close are they located to vulnerable· populations?
- What do the zoning laws in your community say about the siting of hazardous materials facilities in relation to populated areas? What decisions is your zoning board making about HAZMAT facilities?
- What do local zoning laws say about siting schools, daycare, hospitals, nursing homes, and the like near hazardous materials facilities? What decisions is your zoning board making?
- Have other community institutions done what they need to do to prepare for a chemical emergency at a specific plant? Do schools, nursing homes; daycare centers, or prisons have shelter-in-place drills and evacuation plans? Do hospitals, clinics, and trauma centers have the capacity to deal with casualties from a large accident? Have highway and traffic authorities taken steps to ensure bottlenecks don't impede evacuation?
- How does the information in the RMP stack up against other measures of a facility's environmental performance? How does the RMP information compare to information submitted under EPCRA? How does the RMP compare to what you know about the facility's production and use of raw materials? To its air and water discharge permits? To its shipments of hazardous wastes under the Resource Conservation and Recovery Act or releases of hazardous materials under CERCLA?

Questions to Answer for Citizens

Experts say that when citizens learn about hazardous chemicals used near them, they most want answers to questions such as the following:

- What are the health effects of hazardous substances at the site?
- Axe community injuries or deaths likely from this site's hazards?
- How does it affect the environment?
- Is the facility addressing this potential risk?
- Can alternative chemicals be used?
- Are community planners and responders aware of the facility's emergency response plans?
- How can I independently verify this chemical risk information?
- Is the facility reducing, eliminating, and preventing possible hazards?

Chapter 6: When the Siren Sounds: Reporting on a Chemical Emergency

This chapter highlights a few things reporters should consider when reporting on a chemical emergency -- before heading to the site, at the site, and after the event.

Even before an emergency, it is a good idea to compile a list of the names and phone numbers you are likely to need in case of a chemical emergency.

The list could include the members of the LEPC, the chief of your local HAZMAT team, the chief of the fire department, the director of the local emergency management office, the press and chemical emergency contacts for major local facilities, local university chemical engineers and toxicologists, the chair of the SERC, and the emergency contact at the EPA regional office.

You may find contact names and numbers in the LEPC's emergency response plan, TRI, or the local facilities' RMPs. A contact and referral guide is also included on the National

Safety Council's Crossroads Web site (http://www.crossroads.nsc.org). Also check EPA's Web site (http://www.epa.gov/ceppo). If you have a radio scanner, try finding out what frequencies local HAZMAT responders use, not only for dispatch but also for operations.

Understanding the existing chemical hazards in your community and facility and community emergency preparedness (discussed in chapter 5) is very helpful when reporting on an emergency.

This knowledge, for example, will allow you to be aware of the possible risks, the populations at risk, and the community's and the facility's emergency response plans ahead of time, which can make reporting more efficient and effective.

Preparation Before Heading for the Emergency Site

Before you head to an emergency site, have a copy of the LEPC's emergency plan and the facility's RMP (if it filed one), including its OCA and emergency response plan. Have hazards at the facility had been identified?

Did the LEPC identify this plant as a potential hazard? Did the plant notify the LEPC of its use or storage of hazardous substances?

Did it file a Tier-II form? Has a vulnerability zone around the facility been identified? Was the LEPC aware of the presence of the affected chemicals at the facility?

Take with you a list of the names and phone numbers of people you may need to contact (e.g., LEPC members, local HAZMAT responders, facility spokespeople, and chemical emergency contacts).

A Reporter's Safety Checklist

A critical point to keep in mind is that the very aspect of the event that makes it newsworthy-the sudden and uncontrolled release of hazardous chemicals-may make it a risk for reporters covering the story.

You do yourself and your readers, listeners, and viewers no favors if you become involved in the story and suffer adverse health effects that either diminish your ability to cover the story or delay the cleanup efforts under way.

- DO NOT GO INTO THE "HOT ZONES." Hot zones contaminated with hazardous materials present health risks to reporters just like other people. Also, transgressing those borders can be dangerous to official response personnel whose full attention during such an emergency should be focused on the response and cleanup.
- Upon reaching the scene, find the designated emergency response officials who are responsible for dealing with news media while emergency response actions are underway. Many facilities will have spokespersons and meeting areas specifically for the media.
- Be aware that electronic equipment, such as cameras and recorders, can be damaged by hazardous materials and can cause sparks that could worsen the situation.

Questions to Ask at the Site

The Particular Chemicals and the Release

- What chemical or chemicals were involved in the incident?
- How much was released? When did the release occur?
- Is it a gas, a liquid, or a solid?
- At what temperature was it released?
- Where on the property was it released?
- How fast is the chemical likely to travel off site? How fast will it disperse? Where is it likely to go?
- Is the chemical reactive? When mixed with other materials, will it become more volatile or hazardous?

Meteorological Factors

- What are the current temperature, humidity, and wind conditions? Are they considered favorable or unfavorable as they affect the spread of the chemical?
- What is the short-term forecast for changes in the weather?
- How will it affect the chemical?

Physical Surroundings and the Community

- What is the nature of the area-is the terrain flat or hilly, wooded or open, rural or developed? How might the physical environment affect the seriousness of the incident?
- How close ·are the nearest residences or businesses? Are population centers nearby that might be particularly vulnerable such as schools, hospitals, nursing homes, prisons, or shopping centers? Have they been notified of the release?
- Are nearby residents being instructed to evacuate or shelter-in-place? What are the criteria for deciding?
- What key infrastructure facilities (e.g., water supply, sewer, power, police, transportation routes) might be affected by the incident?

Health Risks

- What are the potential health effects of the chemicals involved? How do health risks relate to the duration of exposure? Route of exposure? Concentrations?
- By what routes are humans exposed to the chemical? Is it inhaled? Is it absorbed through the skin? How do those routes of exposure relate to potential health effects?
- Would adverse human health effects from the chemical be made worse by exposure to a different chemical at the same time?

Protecting the Public: Shelter-in-Place Versus Evacuation

There are two basic ways to protect the public in the event of a chemical release into the air: evacuation away "from the toxic cloud or sheltering in a protected area. Emergency management professionals generally agree that evacuation is more effective -- if time allows. Because time is often not available, however, other options need to be considered to protect populations in areas around facilities with hazardous chemicals.

Shelter-in-place is simple in concept; it takes advantage of the inherent protection provided by buildings to limit people's exposure to toxic gases in a chemical release. The critical factors in the effectiveness of sheltering-in-place are how long the building is exposed to the toxic gas and how quickly the toxic material gets to where people are in the building. Several analyses have shown that in-place protection can be effective for up to several hours, depending on the "tightness" of the place used as a shelter. A few simple steps, such as turning off heating and air-conditioning, closing windows, and going to an interior room can significantly limit exposure. More extensive efforts could include sealing an interior room with tape and plastic. Even with these efforts, as a cloud of gas from a chemical accident surrounds a building, some of the toxic gas will begin to seep into the air within the structure. If the toxic cloud remains long enough, the toxic concentration within the building will eventually reach a dangerous level.

Shelter-in-place and evacuation both require that the public take some action to be effective. For either to work, the public must (a) believe that the action will be effective, (b) understand how to carry out the action, and (c) be capable of doing so. Some research shows that people are more likely to follow evacuation instructions than shelter-in-place instructions.

John Sorenson and Barbara Vogt (1999), of Oak Ridge National Laboratory, analyzed public response to a recent chemical emergency in Arkansas. People in part of the affected area were instructed to evacuate while people In another part of the affected area were Instructed to shelter-in-place. Those in the evacuation area generally did as they had been instructed. However, a significant number of people who were instructed to shelter-in-place also evacuated. Similarly, in Deer Park, Texas, where industry and local authorities have actively promoted shelter-in-place over evacuation for more than 5 years, a 1995 survey of Deer Park residents indicated that more than one in five said they would probably evacuate if warned of a chemical emergency (Heath et al., 1995).

Questions to Ask After the Event

Follow-Up Questions

- How many people were injured or killed? How many were employees? What is the nature of any injuries?
- How did the incident happen (e.g., negligence, poor safety procedures, storage conditions, act of nature)?
- What is the safety record of the facility involved (look at the 5-year accident history in its RMP, if it submitted one)? What about the record of its parent company?
- How was the incident cleaned up? How long did the cleanup take?
- How was the surrounding environment affected?
- Have similar incidents occurred in the area?
- What active (e.g., sprinklers) or passive (e.g., dikes) mitigation devices were in place?
- Was the facility required to report the incident under any federal legislation such as EPCRA, RMP, Spill Prevention Control and Countermeasures Plan Rule (40 CFR 112), or the PSM Standard? Under state or local regulations? Is it in compliance with these regulations?
- Did the facility have an emergency response plan? Did the plan work during the emergency?
- Had the facility defined a vulnerable zone? If so, how did this zone compare with the actual area affected?
- What chemical safety and emergency response training does the facility provide to its employees and contractors?
- What routes are used by the facility to ship and transfer its hazardous materials?
- If the incident involved a storage area, were the storage conditions adequate?
- Was the facility aware of the risk of an emergency? Was it identified in the RMP?
- Did the facility have equipment onsite to detect a release?
- Was emergency medical care available onsite?
- Are there any possible substitutes for the chemical released?
- What are the environmental and health issues posed by substitutes? What are the economic issues involved in using substitutes?

Questions for the LEPC

- Had the LEPC identified the facility as a possible hazard?
- Had the LEPC determined the potential vulnerable zone around the facility due to the chemicals stored onsite?
- Did the LEPC have an emergency response plan? Did it work during the emergency?

Questions for Emergency Response Officials

- Which emergency response teams responded to the incident and why?
- How did response personnel respond to the incident?
- Were they trained in hazardous materials response procedures?
- If not, why not?

Chapter 7: Reporting on Routine: Chemical Releases

In addition to information on accidental releases potentially resulting in emergency situations, TRI includes information on routine, planned releases of chemicals.

A number of organizations have drawn up suggested questions about routine releases based on the Section 313 TRI reports.

The following are some questions based on suggested questions from the Natural Resources Defense Council, a national environmental membership organization:

- What percentage of the total reported releases is routine?
- What percentage is accidental?
- What is the basis of the emissions estimate? Actual measurements provide the most accurate information. When and for what chemicals were they performed?
- Has the industry measured or estimated human exposure to the chemicals?
- Are there air or water monitors? Are they located downwind or downstream of the disposal locations? How far are they from the point of release? How often do the monitors collect the samples?
- What concentrations of the chemical have been detected? Is the chemical harmful in that volume? Which substances disperse or degrade?
- What are the environmental and health effects of the chemicals released? Are health effects long term (chronic) or short term (acute)?
- What health effects has the particular chemical been tested for? What health effects have not been tested for?
- Is the reported risk for a person with the most exposure or a person with average exposure?
- Do the major sources of the toxic releases within the facility have pollution controls? Are any additional control measures available? If so, have they been installed? If they have not been installed, why not?
- Has the company ever analyzed what can be done to reduce releases?
- Has the company reduced or increased releases from the fast year?
- Do federal, state, or local standards regulate the release of these chemicals? What federal, state, or local permits apply to the facility? Is the facility in violation of any of these permits?
- Are there less toxic substitutes that could be used?

Reporters might also consider some questions about what isn't available under TRI:

- Has the company kept the identity of any chemical releases secret? If so, why?
- Do other facilities exist in your community that are not covered under TRI but that may be releasing the same chemicals?
- Are there any local facilities that have not filed their required reports?
- What chemicals are released but not covered under TRI?

Activist environmental organizations, of course, are not alone in putting forth questions concerning chemical information.

The American Chemical Society poses the following questions for local public health officials to ask.

They are questions that in many cases cannot be answered based on the information available under EPCRA, but they are questions that might be sparked by the availability of that information:

- Were releases continuous, intermittent, or planned?
- What else is the chemical combined with or in the presence of?
- How often, when, and how are the releases occurring? What were the quantities emitted per day?
- At what height are emissions released?
- At what temperature are emissions released?
- Where on the property did the release occur?
- What is the predominant daily wind direction? Are releases restricted during certain wind or weather conditions?
- What are the potential exposure routes (e.g., drinking water, air, surface water) for the community?
- Are the concentrations safe? What is the danger of chemicals detected at low concentrations? What is the source of that information?
- How much of the chemical could be safely breathed or ingested by an individual?
- Is anyone in the community at risk? (LEPCs, using 302, 304, and 311/312 data, may be good sources of perspective on this question.)

Chapter 8: Your Computer as a Reporting Tool

The computer is as important a tool for reporters as the telephone and notepad.

Many media outlets hire specialists in computer-assisted reporting. While computer-assisted reporting has grown in popularity as a buzzword, many editors and reporters still don't fully understand its vast potential.

TRI came out shortly after the dawn of the computer-assisted reporting boom.

It was one of the earliest and biggest opportunities for reporters specializing in the environmental beat to do computer-assisted reporting.

Over the years, it supplied the raw material for a lot of stories, many of them good and some of them great.

Since the advent of the Internet and the World Wide Web, the possibilities for computer-assisted reporting have grown even further.

Most reporters now use the Web for basic information gathering, almost as a reference library.

This "lookup" function of the Web or computer databases is handy and certainly the most common way databases are used in reporting. Yet it scarcely begins to exploit the possibilities of the computer as an investigative tool.

One of the most useful resources for reporters wanting to explore the computer as an investigative tool is the National Institute of Computer Assisted Reporting (NICAR, http://www.nicar.org), an arm of Investigative Reporters and Editors (IRE). NICAR provides training and maintains a list-serve.

It also collects useful government databases, puts them into user-friendly formats, and then makes them available to reporters at nominal fees.

Environmental groups have also taken advantage of computer-assisted reporting opportunities.

A prominent example is USPIRG, which did a report in November 1996 titled, Costly Chemical Cover-Up: Anti Right-to-Know PAO Contributions.

It used Federal Election Commission data to examine the relationship between chemical company campaign contributions and congressional opposition to chemical right-to-know laws.

Another example is USPIRG's July 1998 report, Too Close To Home: A Report on Chemical Accident Risks in the United States.

It took available information from TRI and population data and used air-dispersion modeling to calculate worst-case chemical releases for areas all over the United States. EDF's Chemical Scorecard Web site (http://www.scorecard.org) has essentially done the data crunching to make a "local story" on chemical hazards for any place in the United States.

National Databases

The quantity and variety of electronic data available to reporters interested in toxic ·and hazardous chemical issues have grown over the years. A few of the national databases are described below.

The Toxic Release Inventory

TRI is one of the major national environmental databases, and, because data have been accumulating for more than 10 years, it has become one of the largest. TRI has also become easier to access and use.

TRI is available through EPA's Envirofacts Warehouse (http://epa.gov/enviro).

You can query the database to request specific data. You could, for example, ask for complete TRI information on all the reporting facilities within your city.

Or you could ask for the names and cities of all the facilities nationwide releasing hydrofluoric acid.

If you have a more ambitious project in mind, or want to have it on your own computer for handy reference, you can also get a copy of the entire TRI database.

Most of the historical data are available free in CD form.

RMP*Info™

RMP*Info™ (http://www.epa.gov/enviro) is EPA's database that contains the registration and executive summary information from RMPs submitted by each facility.

Facility operators submit their data electronically through Submit™ and then certify it with signed hard copies.

Because of a law passed in August 1999, RMP"'Info™ and other electronic databases will not include information on the facilities' worst-case and alternative scenarios, at least not until after August 2000. (See chapter 4 for a discussion of restrictions on distribution of the OCA data.)

Envirofacts Warehouse

Envirofacts Warehouse (http://www.epa.gov/enviro), EPA's gateway to most of its online databases (including RMP*Info™ and TRI), is a valuable tool for environmental reporters.

Part of its usefulness lies in its comprehensiveness. It includes, for example, databases of wastewater discharge permits and air pollution discharge permits, as well as violations of drinking water standards.

The other part of its usefulness lies in the fact that it is geographically focused-you can get lots of data for a particular area.

Chemical Scorecard

Chemical Scorecard (http://www.scorecard.org) is an online interface that publishes EPA databases and other information on hazardous chemicals in the community. It is run by EDF with funding by various foundations. Scorecard heavily emphasizes local impacts, user-friendliness, and citizen action.

RTKNet

RTK Net (http://www.rtknet.org) is operated by the nonprofit OMB Watch and the Unison Institute.

It is funded by various government agencies and foundations.

RTK Net provides free access to numerous databases, text files, and conferences on the environment, housing, and sustainable development.

Others

Many other databases are available that relate to chemical releases and chemical hazards. A selection is listed on the National Safety Council's .Crossroads Web site (http://www.crossroads.nsc.org).

General Project and Story Ideas
Accident History

Each RMP should have a 5-year accident history. To help determine whether it is complete, you can check RMP data against one of the six or more federal accidental release databases in the reference section of the RMP.

Of course, you should check human sources too, such as plant employees or local HAZMAT responders.

Federal-State Comparisons

Many states have their own reporting and database requirements, and each is different.

Try to confirm EPCRA, RMP, or PSM data against relevant portions of any state database available to you. Inconsistencies may help identify reporting violations or other stories.

Cancer and Disease Incidence

Look for whatever cancer (or other disease) data are available, for example through the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database (http://www-seer.ims.nci.nih.gov/).

Ask your county and state health departments what data they have available. Does disease incidence in your area correlate with toxic releases?

To properly understand these questions, you will need the expertise of professional epidemiologists.

Cumulative Exposure

Examine the data for your locality in EPA's Cumulative Exposure Project (www.epa.gov/oppecumm/index.htm).

This project is examining how much toxic contamination Americans are exposed to cumulatively through air, food, and drinking water.

Remember that these are estimates. Local breakdowns are currently available from the Chemical Scorecard Web site and may eventually be available from EPA. TRI data can be used to identify which releases may be responsible for the highest exposures in your locality.

Pollution Database Consistency

Check data on releases and chemical use from TRI and RMP against data from EPA's other pollution databases.

EPA's wastewater discharge permits (the Permit Compliance System database), air pollution sources (the Aerometric Information Retrieval System/AIRS Facility Subsystem database), and hazardous waste handling (the Resource Conservation and Recovery Information System database) are obvious starting points. All of these databases can be accessed through EPA Envirofacts (www.epa.gov/enviro).

Do data from one source suggest that data from another source may be unreported, underreported, or unaccounted for?

OSHA Violations

If there is a particular plant whose releases concern you, you may want to check out any OSHA violations. OSHA's Integrated Management Information System database (http://www.osha.gov/oshstats/) details OSHA plant inspections and whether or not violations were found.

Look into any violations involving hazardous chemicals you may find significant sub-threshold or unreported releases or careless practices that could result in releases.

You can also get the data from NICAR's database library for a fee.

Chemicals of Concern

One or more major plants in your area may have routine emissions (or potential releases) of particular chemicals that are especially large. TRI and RMPs will help identify them.

Are there other sources of the same chemicals (or family of chemicals) that might add to the total exposure? What are the health effects of these chemicals?

What are the estimates (if any have been made) of the actual exposures to these chemicals?

Nationwide Company Performance

Your local plant may be one of many owned and operated by a large corporation. Its toxic releases and the hazards it presents to your community may be part of a larger picture of corporate performance.

You can use TRI, RMP*Info™, and other databases to try to build a picture of the situation at the company's other plants.

Does the company have a good overall safety and pollution record? How does that record compare with those of other companies in the same industrial category?

Local Laws, Programs, and Codes

Explore how local laws and rules take chemical safety into account.

For example, what are the provisions in the local fire and building codes that apply to buildings where hazardous chemicals are stored, processed, or used?

Are there databases of fire inspections, building permits, or other local regulatory actions? Try matching these with TRI and RMP data.

Mapping Project and Story Ideas

As desktop computers have grown in power during the last decade, enormous advances have been made in the use of maps to organize and display information in databases. Such systems are often called geographic information systems (GIS).

A number of GIS databases and software packages have been developed specifically for environmental information.

When EPA began consolidating the user interface to its databases under Envirofacts, it suddenly became possible to easily see how many kinds of environmental information related to a single location.

Not only was it possible to see all the air and water pollution dischargers in a single town, for example, but it was also possible to further connect such data with local natural resource features or demographics.

A number of map-oriented systems have hazardous chemical data, in addition to Envirofacts. EDF's Chemical Scorecard does perhaps the best job of making data user friendly and community relevant.

There are numerous systems for organizing geographical databases. Explaining the complexities of them is beyond the scope of this guidebook, but you can find more information at the Census Bureau's Web site (www.census.gov/ftp/pub/geo/www/faq-index.html).

Most systems work by associating data with particular coordinates in two-dimensional geographical space, such as latitude and longitude on a map (a third dimension, altitude, is also common).

There are several widely used commercial software products such as ArcView (http//www.esri.com) or Maplnfo (www.mapinfo.com).

Another, developed by the EPA, the National Oceanic and Atmospheric Administration, and the U.S. Census Bureau, is called LandView. LandView is distributed free online (www.rtk.net). Further information is available from the U.S. Census Bureau (www.census.gov/geo/www/tiger/landview.html).

GIS mapping is a great way to generate graphics that will be meaningful to your audience. Here are some ideas that may get you started on stories.

Map the Footprints

Map offsite footprints of the worst-case and alternative scenarios for all the RMP sites in your community. How would the footprints change if various assumptions were changed? How much of your community is potentially vulnerable to hazardous chemical accidents?

Map Vulnerable People

Use available maps (traditional and digital) to identify the human receptors that might be affected by hazardous chemical releases in your community: schools, hospitals, daycare centers, nursing homes, and the like. People in your newsroom are probably an excellent source of information about such facilities, even if the facilities are not on the maps.

How do the human receptors you can identify compare with the ones identified by companies in their RMPs?

Describe Vulnerable Populations

Use Census maps and data to describe the demographics of populations within the "footprint" areas that would be affected by a worst-case accident in the various RMPs.

What can you learn about the age, economic level, race or ethnicity, and possibly reproductive status of people who are most vulnerable to accidents?

Map Zoning Restrictions

Compare the vulnerable populations with the zoning maps or "Master Plan" maps (if any exist) for your community.

You may be able to layer onto this further data about property taxes or assessments or building permits, depending on what's available.

Has there been much recent new development in vulnerable areas?

Have facilities such as schools or hospitals been sited in vulnerable areas? Does existing zoning encourage development or siting in vulnerable areas?

Examine Government Programs

Do any federal, state, or local government programs encourage or subsidize siting of housing or vulnerable facilities within high-hazard areas?

Is the federal government building low-cost housing within the vulnerable zone? Is the school board building new schools there?

Map Cumulative Exposures

Get the estimate data for your community from EPA's Cumulative Exposure Project.

These estimates are made at the census tract level. Use mapping to compare how these data relate to demographics and to TRI releases and RMP footprints.

Map Weather, Climate, and Hydrological Data

Weather, climate, and hydrological data are available from the National Oceanic and Atmospheric Administration and the U.S. Geological Survey.

What are the prevailing winds? Are releases upwind of populations? How cold or hot does it get? This affects equipment and process performance and the behavior of hazardous chemicals.

Does it rain or snow a lot? Is the area subject to hurricanes, tornadoes, earthquakes, or landslides? Is the facility on or near a flood plain? A groundwater recharge area? The watershed of a drinking water source?

Map Natural Resource Data

Map the data for environmental receptors such as wildlife refuges, parks, forests, critical habitat for endangered species, lakes and streams (especially those used for drinking water, swimming, fishing, or _recreation), or other sensitive habitats.

Map Transport Routes

Map routes (road, rail, water, and pipeline) for vehicles involved in transport and disposal of hazardous raw materials, products, and wastes associated with the RMP or TRI facility.

How do these routes match up with accident patterns and vulnerable populations?

Some Issues and Cautions

Many of the problems of computer-assisted reporting have nothing to do with hazardous chemicals and everything to do with the computers themselves.

These issues are beyond the scope of this book, but information and advice is available from NICAR and other sources. Before you launch a computer-assisted reporting project, it is wise to know what challenges you will face.

Probably two of the key ingredients in a good computer-assisted reporting project are knowing where the data are and being able to ask good questions. This guidebook tries to help you find key sources of chemical hazard data, especially at the federal level.

But this book is far from exhaustive, especially when it comes to state and local data.

For local and state databases, you may find that a critical step in your project is getting a usable electronic copy of the database you seek. Your state may have open-records and freedom of information laws that will help.

But the data will do you no good if it is in a medium or format you cannot read. Also, data can have many errors and inconsistencies that have to be fixed before you can use it.

Close familiarity with the structure and content of available data will help you formulate questions that can be answered with computers. There is no substitute for manually "paging through" the data and eyeballing it to get a feel for it. Are there obvious misspellings? Are there a number of empty fields? If so, do you understand why? Are the data expressed consistently? Are the numbers plausible?

Computers need consistency. Your database may have entries for "Acme Corporation," "Acme Corp.," "Acme Chemical," and "Acme Chemical Specialties Corp." Are these all the same company? It makes a big difference.

In 1999, EPA began several initiatives aimed at standardizing its different databases.

The Facility Identification Initiative (www.epa.gov/enviro/html/fii/index.html) set a standard that allows most information about facilities in Envirofacts Warehouse to be linked. Another initiative was EPA's Sector Facility Indexing Project (http://es.epa.gov/oeca/sfi/index.html), which offers a fuller profile of selected facilities.

Chapter 9: Deciphering Hazards and Risks

Although effective reporting on controversial public health issues does not require coursework in toxicology and chemistry, some understanding of these subjects is clearly helpful. Understanding a hazard often comes down to knowing the following factors:

- A chemical's health effects
- The concentration of exposure
- The duration of exposure

Terms such as immediately dangerous to life and health (IDLH), emergency response planning guidelines (ERPG), endpoint, risk, distance to endpoint, level of concern, and toxic concentration are tools of the trade for emergency managers in government and industry to describe the health risks associated with hazardous substances in the community.

Hazard Versus Risk

A hazard is something that is capable of causing harm. The bigger the hazard, the greater the capacity to cause harm.

A chemical hazard is based on properties intrinsic to the material and the level of exposure. Hydrofluoric acid is toxic; propane is flammable. Little can be done to change these characteristics. The severity of the hazard often depends on its concentration and exposure.

Risk is a measure of probability. It refers to the likelihood that an event will occur -- the possibility of a release. The greater the risk, the more likely the hazard will cause harm. Ideally, risk should be quantified-for example, a 10% probability that a certain event will occur.

Too frequently, however, the data related to rates of equipment failure, human error, and other factors are unavailable, so it is not possible to reliably quantify chemical risk. Nevertheless, we know from experience that incidents happen more. Frequently during some events, such as transfer operations or process startups.

RMPs only provide information on the potential impacts of a chemical release (hazard), not the likelihood it will happen (risk).

Case Study: Chemical Release Incidents and Community Reaction

The Richmond County School Board in Augusta, Georgia, was accused by some of courting disaster by building a $20 million high school 670 yards from two large chemical plants. Others in the community were not concerned. In July 1998, EPA presented incident modeling data showing that the planned site for the high school was inappropriate because of its proximity to the Rutgers Organics and Amoco Polymers facilities, which used large amounts of hazardous chemicals. Richmond County Emergency Management Director Pam Tucker requested the EPA report. EPA's projected accident scenarios foreshadowed the real thing.

On November 17 and 20, 1998, according to reports from the Augusta Chronicle, General Chemical Corporation in Augusta, Georgia, accidentally released sulfur trioxide, which becomes deadly sulfuric acid when it comes in contact with moisture. The first General Chemical incident sent 51 people in the community to area hospitals complaining of eye and lung irritation. The release occurred at 2:35 P.M., while students were in school. Students and teachers at two schools, an elementary and a middle school, located less than 2 miles away, were affected. The elementary school had a shelter-in-place program, but it received no warning of the November 17th release. There was a 2-hour delay between the release and notification of emergency personnel.

Three days after the first release, the facility released a cloud of sulfur dioxide gas as part of a planned process. However, the weather conditions kept the cloud from dispersing as expected. Exposure to the cloud forced 39 workers at an adjacent facility to seek medical treatment for symptoms that included shortness of breath; burning and irritation of the eyes, nose, and throat; and nausea and vomiting.

A November 19th Augusta Chronicle story provides a concerned parent's assessment of the first accident. "That's exactly the type of thing we're concerned about," stated Dietrich Dellerich, a member of Citizens for Fair Schooling. "We're concerned about all of the schools near chemical plants, but to put a $20 million investment under one of the plants is ludicrous. I hope and pray nothing ever happens near the new school, but you can't eliminate human error. You have to eliminate the risk."

But other Augusta citizens believe they can live with these risks, the Chronicle reported. The school board approved the high school's construction. Seven schools, including the middle school and elementary school affected by the November releases, are already located less than 2 miles from an area of Richmond County with a significant concentration of chemical plants.

Deputy School Superintendent Gene Sullivan is one of those who view worry as needless. He was quoted in a December 12, 1998, Augusta Chronicle story as saying, "The area is booming; people are buying and building homes there. We keep harping on this issue. If it's such a scary area, why are people continuing to live and move there? We are building the school where the people live."

This case illustrates how information from a facility's RMP could be perceived in different ways and could affect community decision making.

Conditions and Factors Affecting Chemical Hazards

Chemical Reactions

The first step in recognizing a hazard is to identify the chemical or chemicals that could be released. Identification is relatively simple when a pure material or refined, final products are involved.

But identification can be more difficult if the release could occur while mixtures are reacting and several raw materials or reaction products are involved. For example, because the two Augusta incidents (see sidebar) occurred at different stages in the same chemical process, different chemicals were released by the two events.

In addition, the reaction of released chemicals to other materials in the environment may make it difficult to identify resulting hazards. For example, sulfur trioxide reacts with humidity and other water sources to create sulfuric acid. Although the RMP Rule does not regulate sulfuric acid, it does have corrosive properties that make it dangerous.

Amount, Rate, and Duration of Release

The amount and duration of a chemical release can affect the size of the area subject to the hazard, so it is often important to be able to identify how much material is released for how long. The concentration of the chemical in a cloud is also influenced by (a) the rate at which the release occurs, (b) the size of the area from which a liquid spill can evaporate, and (c) its temperature.

Government representatives questioned the Augusta chemical plant's initial report of the quantity and duration of the sulfur trioxide release because a larger-than-predicted area was affected. However, federal investigators found no evidence to contradict the reported release.

This example demonstrates that predictions may not always be reliable.

Weather Conditions

Variation in the weather conditions under which toxic chemicals are released can affect the extent of a hazard. Higher temperatures and less wind generally lead to a greater hazard. The sulfur dioxide release in Augusta in 1998 demonstrates some of the difficulties in recognizing and predicting hazards, because it was an expected and permissible startup release. Although this type of release normally dissipates quickly without impact, weather conditions on that day caused the vapor cloud to settle on the ground, creating a hazard that sent 39 people for medical treatment.

Physical State

The physical state of a substance -- solid, liquid, or gas -- affects its ability to spread after it is released into the environment (table 1). All of the chemicals regulated by the RMP Rule are either gases or liquids that evaporate quickly. Unlike solids, volatile liquids and gases can readily create large chemical clouds that can move off site. This is what happened in the Augusta incidents. Sulfur trioxide is a volatile liquid, and because it can evaporate rapidly, it formed a dense vapor cloud that affected people several miles away.

Gas clouds stop forming when the leak is stopped; however, liquids can continue to form a cloud after the leak has stopped. Without the means to control the spill, liquids can continue to evaporate, increasing the length of time a community can be exposed to its vapors and increasing the hazard. The faster a liquid evaporates, the more concentrated its vapor cloud may become. The higher the concentrations of chemical, the greater the hazard.

Flammable Chemicals

Clouds of flammable gases or vapors are dangerous because they may result in one or more of several outcomes:

- Vapor cloud fire (flash fire)
- Vapor cloud explosion (a more violent flash fire)
- Pool fire (burning of large puddles)
- Jet fire (pressurized gas or liquid escaping from a hole)
- Boiling liquid, expanding vapor explosion (BLEVE) (an explosive release of expanding vapor and boiling liquid following the catastrophic failure of a pressurized vessel holding a liquefied gas, such as propane)

Table 1: Summary of Hazardous Substances Properties

Property	Influence(s)
Physical State	The physical state of the substance affects its ability to move after it is released into the environment. Gas clouds stop forming when the leak is stopped. Liquids can continue to form a cloud after the leak has stopped, increasing exposure time.
Vapor Pressure	The higher the vapor pressure, the faster the chemical evaporates and the more concentrated, a vapor cloud may become.
Density	Heavy gases tend to create a larger hazard. They tend to settle at ground level, increasing their contact with living things.

Explosions can cause powerful shock waves that may directly cause injuries and property damage. Shrapnel and structural damage created by the blast may result in additional injuries.

Fires resulting from chemical releases generally do not have an offsite effect; they are typically confined to the property where the incident occurs. Sites with the potential for large fires often establish distance between the manufacturing processes that handle flammable materials and the end of the property line. That distance usually prevents fires from spreading offsite. The heat radiating from a fire may be more likely to cause injuries and property damage in the nearby community.

Vapor Pressure

The vapor pressure value is an index of how quickly a liquid will evaporate (table 1). The higher the value, the faster the chemical evaporates. Most toxic liquids regulated by the RMP Rule have a vapor pressure of at least 10 millimeters of mercury (mm Hg) at ambient temperature, usually assumed to be 68° Fahrenheit. As a point of reference, the vapor pressure of water is 23 mm Hg. Sulfur trioxide has a vapor pressure of 344 mm Hg at ambient temperature, indicating that it can quickly evaporate and create a dense vapor cloud. Only two regulated toxic substances (toluene 2,6 diisocyanate and toluene diisocyanate) have a vapor pressure less than 10 mm Hg.

Density

Another important property is the density of the gas or vapor (table 1). Many gases regulated by the RMP Rule are called heavy or dense gases because they are heavier than air. Heavy gases create a greater hazard because they tend to settle at ground level, increasing their contact with living things. Air has a density of 1; sulfur dioxide, a heavy gas, has a vapor density equal to 2.26. High humidity at the time of the November 20, 1998, release in Augusta helped to trap the sulfur dioxide gas, allowing it to settle and injure workers before it could be diluted and swept away by the wind.

The RMP Rule also regulates some neutrally buoyant gases. These gases have densities closer to that of air, so they tend to neither float nor sink in the atmosphere. Wind and atmospheric turbulence play a large role in determining the extent to which releases of these chemicals affect communities.

Toxicology for Journalists: How Toxic Is Toxic?

For environmental journalists reporting on a frequently controversial public health issue, a little knowledge of toxicology can go a long way toward better reporting and better understanding and explaining "How toxic· is toxic?"

It's not enough for reporters to simply keep in mind the old toxicology saw that "the dose makes the poison." Although true, that point is subject to abuse from those wanting to minimize environmental risks. Dose is the quantity of chemical to which an individual is exposed over a given period. Two additional concepts – potency and exposure -- are particularly important. Only with an understanding of both of these concepts can the health risks of a given dose be assessed.

Potency refers to the toxicity of a chemical, that is "the ability of a chemical to do systematic damage to an organism," as the Foundation for American Communications' 1989 Toxicology Study Guide for Journalists describes it. Chemicals have potency regardless of whether humans or other living organisms actually come into contact with them. Different chemicals have different potencies.

One chemical is more potent than another if a given amount produces a greater adverse health or ecological effect than the same amount of the other. Amounts can be expressed in different terms -- as concentrations in the atmosphere or water or in grams ingested per unit of body weight. Once the amounts are expressed in equivalent terms, you can compare potency.

Exposure, on the other hand, refers to whether and how a human or other organism comes into contact with the chemical usually by eating or drinking it, inhaling it, or touching it and having it penetrate the skin. If there were no exposure, there would be no harm. The amount of risk can vary depending on the nature and duration of the exposure and the concentration of the toxic chemical in question. The human body metabolizes different toxins at different rates, and individual rates vary. When an individual's exposure exceeds the body's ability to metabolize it, the toxin accumulates.

When it accumulates to a certain concentration, it can cause injury or death. How and why a chemical affects or does not affect a human body is a function of its particular chemical structure.

Health Effects

Chemicals vary in potency and toxicity. A highly toxic chemical, such as sulfur trioxide, can cause harmful effects from exposure to a small amount in a short time. Less toxic chemicals require larger doses or longer exposure times to cause effects.

Michigan State University toxicologists Alice Marczewski and Michael Kamrin (1987), with the Center for Environmental Toxicology, write that "Every chemical is toxic at a high enough dose. The dose of a chemical plays a major role in determining toxicity.

Generally, there is no effect at low doses, but as the dose is increased, a toxic response may occur. The higher the dose, the more severe the toxic response that occurs."

In addition, the susceptibility of an individual to a chemical exposure is also critical in addressing the "How toxic is toxic?" question.

Factors such as age, health, nutrition, and medical history can influence an individual's sensitivity to a particular chemical. Previous exposures to toxic chemicals can worsen the effects of subsequent exposures to the same or different chemicals.

If a chemical does not penetrate far into the body, any effect would be local, at the site of contact, rather than systemic or system-wide. Some chemicals with local effects are considered corrosive rather than toxic.

On the other hand, if the toxic chemical is absorbed into the bloodstream, it can travel throughout the body and produce systematic toxic effects in the organs most sensitive to the chemical.

Chemicals are acutely toxic when they result in harm after relatively brief, one-time exposures. In these cases, the harm is manifested within minutes or hours of exposure and in areas other than just the site where the chemical first entered the organism.

The chemicals regulated by the RMP Rule are all acutely toxic. They may affect various parts of the body and result in several types of health effects.

For example, sulfur trioxide dissolves readily in water, creating a corrosive solution of sulfuric acid. Exposure could result in eye and respiratory irritation, such as that experienced by victims of the Augusta, Georgia, release, or skin and gastrointestinal tract burns.

Acute toxicity is often measured as "LD50" in rats or mice. That means the dose is lethal to 50% of the animals tested. Expressed relative to the test animals' weights to allow for weight differences between animals and humans, a lower LD50 means a more acutely toxic chemical. Of course human metabolism is not necessarily the same or similar to that of the test animals, so human sensitivity to the chemical may differ.

Chronic toxicity applies to a chemical's propensity for harming an organism over long periods of time-20 or 30 years in the case of cancers-and as a result of repeated, often low-level, exposures. Less is known about chronic toxicity than about acute toxicity, as testing is time consuming, complex, and expensive. Results are complicated by the need to extrapolate from exceptionally high test doses to doses representative of human exposures.

The specific toxic effects can take various forms. Some chemicals cause tumors in tissues (carcinogenic). Others may lead to gene and chromosomal mutations (mutagenic) or adverse effects on the central nervous system (neurotoxic). Still others may cause reproductive and developmental effects.

In summary, the potential health effects are determined by how much of which toxic chemical an individual is exposed to, how often, or how long a duration and by what means of exposure.

Facility Safety: A Key Risk Factor

The 1998 chemical release incident in Augusta, Georgia, illustrates the way release projection data, like the kind that RMPs include, and media coverage of incidents have informed local citizens.

Some people would find the risk in this situation intolerable. Others will choose to live with the risk and insist on better emergency planning from the plants, schools, and emergency response groups.

An Important component in determining a community's level of risk is the overall safety of the facility (e.g., its equipment; management practices, worker training, level of commitment to safety). Some ways to begin assessing how safe a facility is follow.

The Past Is Prelude to the Future

To assess top-level commitment to safety, reporters researching a story may want to look at the RMP section that details an organization's 5-year accident history. A history of safety is generally a good predictor of future safety.

Safe Facilities Have Several High-Level Personnel

Anticipating and Addressing Chemical Safety Problems

Research conducted by Garon Chess et al. (1992) suggests that top-level managerial commitment to safety increases the likelihood that organizations make improvements as a result of independent safety inspections, accidents, and community input.

Chess continues to say that safety and risk management should not be the responsibility of just one person or of too many people.

She found that organizations that perform well at risk management assigned several top managers to identify and solve safety problems. In fact, healthy competition developed between the managers, and bad news was more apt to travel upwards: the production manager, safety manager, environmental engineer, vice president for public relations, industrial hygienist, and the human relations manager all wanted to claim credit for identifying and solving problems (Chess et al. 1992).

Budget Allocations Suggest Priorities

Safe facilities invest in proactive safety measures and work to identify safety problems. Instead of waiting for accidents to reveal weaknesses, these facilities conduct routine safety audits, inspections, and emergency drills.

They secure multiple, independent safety audits from international, national, and local inspectors. Some companies use monetary rewards to encourage line workers to alert supervisors to safety problems.

Emergency Response Is Built on Strong Industry-Government Working Relationships

For example, before an accidental release (which harmed workers and caused a nearby daycare center to be evacuated) at its facility in West Lafayette, Indiana, Great Lakes Chemical had no representation on the LEPC.

After the release, and the adverse publicity resulting from it, company managers began meeting regularly with the LEPC. The company also has sophisticated hazardous materials response equipment it shares with the community.

Safe Facilities Encourage and Learn from Community Input

One company that uses community concern to improve its operations is Sybron Chemicals of Birmingham, New Jersey.

In 1988, Sybron released an acrid-smelling substance that caused area firefighters to evacuate citizens. In addition, a plant fire at the company seriously injured two workers. The community became hostile toward the company because of these incidents.

Top management might have reacted by stonewalling. Instead, the company invested money and time in developing systems that used community input to make it safer. The company installed an alert and warning telecommunications system, which can automatically dial Sybron's neighbors in the event of an emergency.

The system can also work like a sophisticated answering machine with recorded messages about the plant's status. In addition, callers can leave messages requesting further information.

Safe Facilities Are Situated in Communities with High Safety Standards and Regular Inspection Programs

Communities have the power to insist that those who handle hazardous chemicals do so responsibly. One mechanism for enforcing local safety standards is routine inspections. In large communities like Fairfax, Virginia, the county government routinely inspects and issues operating permits to dry cleaning facilities, printers, newspapers, and other facilities that handle hazardous substances.

For example, Steve Dayton, manager of the MBC Reproexpress copy shop in Fairfax, says that when he used anhydrous ammonia to produce blueprints, Fairfax County inspectors visited periodically to ensure that his ammonia tanks were chained to the wall, as local codes required.

In less populated areas, inspection may be more a matter of routine conversations between the emergency authorities like the fire chief and facility managers.

Whether inspection is a formal or an informal process, its use should reduce the risks associated with hazardous substances.

Effective and Assertive LEPCs Result in Strong Emergency Management Programs

Another indicator of local government's alertness to its role in preventing chemical accidents is the adequacy of the LEPC. LEPCs should meet regularly to identify trouble spots. LEPCs have significant authority, if they choose to use it. They can ask for any information relevant to preventing accidents.

Acceptable risk will vary by community and even location within the community. One community's infrastructure, environment, budget, and regulatory framework might be able to handle certain chemical processes that create intolerable risks in another. A community might believe hazardous substances are used safely within a company's walls but want their LEPC to inquire about the routes used to transport hazardous substances into their areas. For example, delivery routes for hazardous chemicals in mountainous areas add an extra element of risk. In Baton Rouge, Louisiana, the LEPC invites a U.S. Coast Guard representative to meet with its members to help them plan for emergencies involving hazardous chemicals carried by Mississippi River barges.

Safe Facilities Operate in Communities with Alert Local Media

The news media can help communities understand risks and what is being done to minimize them. Augusta Chronicle reporter Meghan Gourley, who had access to RMP-like information in 1997, said the biggest obstacle she encountered was that plant managers worried her stories would panic the public.

"The idea is to be up front, but fair," Gourley said. "In no uncertain terms, say [ill a story] that worst-case scenarios are practically impossible. Focus on those scenarios that are more likely. Be sure to detail not only the elements of the disaster, but also what steps officials are taking to help prevent the disaster." Gourley recommends asking facility managers many questions.

Safe Facilities Are Concerned About Security

The Federal Bureau of Investigation, EPA, Chemical Manufacturers Association, and Congress believe that chemical facilities are potential terrorist targets. These facilities contain hazardous substances that can cause mass casualties. This belief led to the enactment of the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act.

To reduce the risk of terrorism, the act limits access to right-to-know information. Nevertheless, the facility remains a security risk, and reporters should inquire about this vulnerability. Key questions include --

- How effectively does the facility secure its perimeter? What are its access policies and controls?
- Can personnel be located and tracked within the facility?
- Does the facility or its parent company have a program in place to safeguard its databases and communications?
- Are there protective buffer zones between chemical operations and neighbors?
- Are hazardous operations fortified against bomb attacks?

Community Reaction

In communities where RMP information has already been reported, citizens generally have reacted by being concerned about their personal safety. They have tended to decide they are willing to live with hazardous chemical risks if facilities can ensure good warning and emergency response systems. Once accidents occur, communities are often less tolerant. The news media can assist both communities and facility managers by helping facilities create awareness and understanding of risk management or risk reduction, instead of just waiting for accidents that harm people.

Tips for Interpreting the Statistics of Risk

Statistical claims associated with chemicals and chemical risks can be complex and even contradictory. Washington Post Senior Writer and Columnist Victor Cohn's book (1989), News & Numbers: A Guide to "Reporting Statistical Claims and Controversies in Health and Other Fields is a valuable tool for reporters covering environmental and other public health issues.

In Chapter 8, "The Statistics of Environment and Risk," Cohn writes,

> the media are typically accused of overstating, needlessly alarming, emphasizing the worst possible case, reporting half-baked and unsupported conclusions, or falsely reassuring. We do them all sometimes. Trying to be objective, perhaps stung by such criticism, we too often write only 'on the one hand, on the other hand stories – I like to call them, ‘he said, she said' stories – without expending any great effort to find the most-credible evidence, the most-reliable statistics, the best-informed, least-prejudiced views, the greatest probabilities.

To Cohn the problem arises because environmental writers function in an arena in that --

- Uncertainty reigns, and data are incomplete, inadequate, or nonexistent.
- We are told different things by different people, and distinguished scientists make opposing, even warring, assertions, such as "The hazard is horrendous" and "The hazard is minimal or nonexistent."
- Many people don't worry greatly about driving, using seat belts, drinking, or smoking, while others are often concerned about lesser and less-certain dangers of nuclear power and chemicals in our foods.

Cohn, citing works of others, points to a few basic facts reporters should try to understand:

- The true complexity of the problem
- The limitations of science
- The limitations of analysis
- The limitations of risk assessment
- The limitations of scientists

Muddling one's way through this morass of uncertainty isn't easy, but Cohn suggests several factors reporters can consider to help identify the "most believable results" and claims.

- Have the results been successfully repeated? Reporters should verify that health claims have been successfully repeated and that different studies of different populations at different times show duplicate the results.
- Have the results been successfully tested using more than one method? Results should be reevaluated using different mathematical techniques.
- Do the claims test high for statistical significance? The probability that the same result could have occurred by chance alone should be small.
- What is the strength of the statistical claim? "The greater the odds of an effect, the greater the strength of an association," Cohn writes in his book. "If the risk is 10 times as likely -- the relative risk of lung cancer in cigarette smokers compared with nonsmokers -- the odds are pretty good that something is happening."
- Are the results specific? Cohn writes that A causes B "is a more specific association than a sweeping statement that substance A may cause everything from hair loss to cancer to ingrown toenails."
- Can the results be explained by confounding factors or other relationships?
- What is the amount of detail in describing data and possible weakness? "There is always a lot of missing data," Cohn quotes Michael Greenberg of Rutgers University as saying. "There are always missing variables. I tend to have more belief in the individual who admits data weaknesses."

Cohn offers numerous questions for reporters to consider asking scientists. A few of them are presented here for illustrative purposes:

- What is your evidence? What do you base your conclusions on?
- Have you done a study? Has it been published or (at least) accepted by a recognized journal?
- When told about ''rates" and "excess risks," ask, What are the actual figures? How many people are affected out of how large a population?
- What sort of rates would you expect normally? What are the rates elsewhere? How do you know?
- Are your assumptions based on human or animal data? How many people have you examined? What species were examined?
- Do you believe your sample -- the people studied -- is representative of the general population?
- How did you pick your sample -- at random?
- Could the association or result have occurred just by chance? Exactly what are your figures for statistical significance? Have you worked with a biostatistician?
- What is really known and what is still unknown? What is the degree of uncertainty? Are you missing any data you would like to have had?
- What evidence might have led you to a different conclusion?
- Are you concluding that there is a cause-and-effect relationship?
- Or only a possibly suspicious association? Or a mere statistical association?
- Have the results been reviewed by outside scientists? Do most people in your field agree that this relationship is right for this agent?
- What is the highest safe level we can tolerate? Is the only safe level zero? Might we be exposed to multiple risks or cumulative effects? Are there individual sensitivities?
- What is the relative importance of this risk compared with others that we face in daily life?

"What we need to tell people, basically, are the answers to these questions," Cohn writes:

- Is it a risk?
- If so, how great or small?
- Under what circumstances?
- How certain is this?
- What are the alternatives?

In addressing these questions, Cohn suggests that reporters "include the uncertainties." He says uncertainties "virtually always exist in any analysis or solution. If all the studies are weak, say so. If no one knows, say so." Reporters should also

> report probabilities ... rather than just that mainstay of jazzy leads, the worst case. This is also called the 'as many as' lead ([for] example: 'As many as a jillion could be killed'). This is not to say that worst cases should not be included -- or sometimes be the lead of the story -- if there is a good enough reason, not just a grab for a headline.

Cohn advocates that health and environmental reporters also "put numbers on risks" when possible and that they "compare risks when appropriate." He encourages reporters to address "scientific and technological fact."

In the end, he quotes Cornell University Professor Dorothy Nelkin, author of Selling Science, as saying, "The most serious problem" in reporting on risk is reporters' reluctance to challenge their news sources and "those who use the authority of science to shape the public view." Nelkin advised reporters, maintain "the spirit of independent, critical inquiry that has guided good investigation in other areas."

Chapter 10: Using the RMP's Offsite Consequence Analysis to Identify Community Hazards

The types of chemicals, their locations, and their quantities are available publicly through several EPCRA reportings. The RMP also provides this information and goes a step beyond by assessing the potential danger these chemicals pose to the community. Reporters will be most interested in the hazard assessment information provided in RMPs, including the worst-case and alternative release scenarios contained in the OCAs. These projections identify the populations in danger if a release occurs.

The OCA is an estimate of the potential harm to people and the environment beyond the facility's boarders of a chemical's release. It provides the four essential elements needed to understand the hazard: ·

- What hazardous substance(s) could be released?
- How much of the substance(s) could be released?
- How large is the hazard zone that could be created by the release?
- How many people could be injured?

Worst-case release scenarios will often tend to be the most sensational part of an RMP-but remember that they describe unlikely, catastrophic events. The alternative release scenarios provide more realistic predictions of events, which, while still serious, are typically smaller in scale. The RMP also identifies other risk factor information, such as the 5-year accident history, accident prevention activities, and emergency response plans.

While the OCAs provide valuable information, this information may be difficult to access, particularly detailed information. (See Chapter 12 for tips on accessing the OCA information.)

Predicting the Extent of Harm from Chemical Incidents

For the purposes of the 'RMP OCA, EPA established specific endpoints (table 2) for toxic and for flammable and explosive chemicals covered by the RMP Rule. Although workplace exposures to many chemicals have been well studied, relatively little information is available about community exposure to these chemicals. Therefore, toxic endpoints used by the RMP Rule are often based on conclusions drawn from workplace data. More than the workforce in a facility, the general population consists of individuals who may be more sensitive and less able to protect themselves the very young, the very old, and the infirm.

Toxic endpoints used by the RMP Rule are typically more conservative and are believed by the EPA to represent better science. Many emergency response planners will be faced with the challenge of adjusting community response plans to account for differences between RMP endpoints and previously used level of concern values. (See "Dr. ALOHA: Choosing a Level of Concern," at www.crossroads.nsc.org for a discussion of approaches for selecting a level of concern).

Table 2: Four Methods of Predicting Responses to Chemical Exposure

Source	Agency/ Organization	Exposure Period	Population Protected	Goal
IDLH	NIOSH	30 minutes	Healthy, adult workers	Escape exposure without respirator
1/10 IDLH	EPA	30 minutes	General population	Allow the public to escape a hazardous area
ERPG-2	AIHA	60 minutes	General population	Prevent effects that could impair the ability to take protective action
TLVs	ACGIH	8 hours	Most workers	Work consistently with no harmful effects

The EPA used four different sources of information about responses to chemical exposures when it selected toxic endpoints specified by the RMP Rule: IDLH, One-tenth IDLH (1110 IDLH), ERPG, and threshold limit values (TLVs).

IDLH values represent the most commonly used source of toxic endpoints. IDLHs were originally developed by the National Institute for Occupational Safety and Health (NIOSH) to guide employee respirator selection.

Airborne concentrations above IDLH values are believed to pose a threat to healthy adult workers who are exposed for more than 30 minutes. Longer exposures are likely to cause immediate or delayed permanent, adverse health effects or to prevent escape from the hazardous environment.

1/10 IDLH measure reduces the acceptable exposure level by a factor of 10 and helps to compensate for exposures longer than 30 minutes. It also compensates for potentially higher sensitivities that can be expected within the general population. Local emergency planners frequently use this exposure value to analyze community hazard analyses.

ERPGs were developed by the American Industrial Hygiene Association (AIHA). They provide three tiers that predict the range of effects from a 1-hour exposure. The RMP Rule uses the second tier values, ERPG-2, as endpoints for nearly 30 toxic chemicals.

These values represent the maximum airborne concentration that nearly all individuals could be exposed to for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action. The ERPG values do not account for individual differences in sensitivities.

TLVs are used as the endpoints for two chemicals regulated under the RMP Rule. TLVs were established by the

American Conference of Governmental Industrial Hygienists (AGCIH). These occupational exposure limits represent concentrations that workers may be exposed to repeatedly for an 8-hour shift and 40-hour week without suffering adverse health effects.

Predicting Harm from Flammable Chemicals

The RMP Rule specifies that three endpoints may be considered when analyzing release scenarios for the 63 flammable chemicals regulated by the RMP Rule:

- A 1 pound per square inch (psi) increase in air pressure 1 resulting from a vapor cloud explosion: Exposure to a 1.psi shock wave will not cause direct injury; it can break windows and cause other property damage that could result in injuries. Some people within an area exposed to a 1 psi overpressure may be hurt. Because glass shards and other shrapnel from an explosion may travel a distance greater than the 1 psi shock wave, it is possible for injuries to result beyond the distance to a 1 psi endpoint.
- Radiant heat of 5 kilowatts/meter2 (kw/m2) for 40 seconds resulting from a fireball or pool .fire: Human skin exposure to radiant heat of this. intensity for more than 40 seconds causes second degree burns or blisters, at a minimum.
- A chemical's lower flammability limit (LFL): The LFL represents the minimum percentage of flammable chemical in the air that must be present for ignition to occur. When a gas or vapor is diluted to a concentration below its LFL endpoint, it can no longer create a fire hazard.

Predicting the Potential Hazard Zone -- the Distance to Endpoint

Once the endpoint is determined, the potential offsite hazard zone of an accidental chemical release -- the distance to endpoint -- can be predicted by air dispersion models.

The models integrate information about chemical properties and release conditions and forecast the area that may become hazardous under certain conditions. Although the flow of some dense gases and vapors will be guided by terrain features, wind direction will generally control movement, creating hazards downwind from the point of release. Since it is not possible to reliably predict when accidents will occur or what the wind direction will be when they do occur, released gases and vapors may travel in any direction. Therefore, the total area that may be affected by a release is represented by a circle with its center at the point of release. The radius of the circle represents the distance to endpoint.

Using EPA's chemical-specific endpoints, facilities can choose from several different methods of calculating the distance to endpoint. They can use the methodology outlined in the RMP guidance or a commercial air dispersion model as long as the model is (1) publicly available, (2) accounts for the required modeling conditions, and (3) recognized by industry as acceptable. An air dispersion model may be more accurate than EPA's methodology for predicting the mixing of pollutants in air and the distance to endpoint.

The results of any method should be viewed cautiously, because few of the fundamental algorithms used by models can be verified in actual field tests.

Models are designed to simulate reality-a very complicated set of variables and interrelations that is difficult to understand and replicate.

Differences in the methods used to combine the effects of each variable can result in hazard distances that vary widely. Predicted hazard distances often lie within a band of uncertainty.

Some OCAs will predict a very large distance to endpoint. However, estimating distances beyond 6 miles tends to be particularly uncertain because of local variations in meteorological conditions and topography.

For example, atmospheric turbulence is a major factor in determining how quickly a toxic cloud will mix with the surrounding air and become diluted.

And how quickly a cloud will be diluted to below the endpoint value will affect the distance it travels. It is dangerous to assume that atmospheric turbulence and wind speed and direction will remain constant from the point where a pollutant is being released (Evans 1998).

A Word of Caution on Using Worst-Case Scenarios

Characterizing danger using only worst case scenarios can be misleading and unnecessarily alarming. Worst-case scenarios estimate the maximum possible area that might be affected by an accidental release. They help ensure that potential hazards to public health are not overlooked. They are not intended to represent a “public danger zone.” Nor do worst-case scenarios reflect whether processes are safe. Both safe and unsafe processes using the same chemicals at the same quantity will have similar worst-case scenario outcomes.

The objectives of the worst-case scenario are (1) to create awareness about potential hazards at the facility and in the community and (2) to motivate a reduction of these hazards. Tim Gablehouse of the Jefferson County, Colorado, LEPC stressed that worst-case scenarios should not be the focus of public discussion. Instead, they should lead to an emphasis on emergency response, risk communication, and prevention efforts. The purpose of the RMP is not to generate unnecessary fear but to educate the public about hazard reduction and emergency response.

Understanding the Worst-Case Scenario

All RMPs are required to contain an OCA for a worst-case release scenario for each regulated process. RMP worst-case scenarios must assume there is a. rapid, ground-level release of the greatest possible amount of a chemical from a single vessel or pipe. Passive mitigation devices, such as dikes and containment walls around the process, may be assumed to capture or control the release if they would be likely to survive the incident.

However, active mitigation devices that require human, mechanical, or other energy to manage releases must be assumed to fail in the worst-case scenario. In addition, weather conditions must be assumed to be very mild, producing minimal mixing of the toxic gas or vapor cloud. These conditions produce a large, stable cloud with a persistent, high chemical concentration -- the most severe type of hazard. EPA states that the maximum hazard zone for worst-case scenarios may be quantified for distances' up to 25 miles. (Note: Some scenarios may extend farther than 25 miles, but will not be quantified beyond that point.)

Table 3: Worst-Case and Alternative Release Scenario Parameters

Factor	Worst-Case Release Scenario	Alternative Release Scenario
Event selection	Produces greatest distance to an offsite endpoint	More likely than worst-case scenario based on the 5-year accident history or failures identified in analysis of process hazards
Mitigation	Can consider the effect of passive systems that survive the event	Can consider the effect of passive and active systems that survive the event
Toxic endpoint	From Appendix A of RMP Rule	From Appendix A of RMP Rule
Flammable endpoint	Explosion of vapor cloud with 10% of available energy released (if endpoint is based on TNT-equivalent method)	Explosion or fire
Properties	Account for gas density	Account for gas density
Wind speed/ atmospheric stability class	3.4 miles per hour and F class stability, unless higher wind or less stable atmosphere can be shown at all times in last 3 years	6.7 miles per hour and D class stability or typical conditions for the site
Outdoor temperature and humidity	Highest daily maximum temperature in the prior 3 years and average humidity	Typical conditions for the site
Temperature of released substance	Liquids, other than gases liquefied by refrigeration, are released at highest outdoor temperature during the prior 3 years or the process temperature, whichever is higher	The appropriate process or outdoor temperature
Surface roughness and nearby obstacles	Urban or rural, as appropriate Urban or rural, as appropriate	Model accounts for gas density
Dense or neutrally buoyant gases	Model accounts for gas density	Determined by scenario
Height of release	Ground level	Determined by scenario
Amount released	Greatest possible amount from a single vessel or pipe	Determined by scenario
Toxic gas release rate	All in 10 minutes	Determined by scenario
Toxic liquid releases	• Instantaneous release • Pool area is 1 centimeter deep or size of passive mitigation area • Rate at which it evaporates must be calculated	Determined by scenario
Distance to endpoint	Greatest offsite distance, up to 25miles	Offsite, If appropriate

Understanding How Alternative Release Scenarios Differ from Worst-Case Scenarios

Alternative release scenarios are based on more likely conditions and offer more realistic, useful emergency planning information for the facility and the public (table 3). Facilities are given latitude in selecting credible release conditions for these scenarios and can use accident history information or other knowledge of the process for selecting the hypothetical incident.

Unlike worst-case scenarios, the weather conditions are assumed to be typical for the area. In addition, these more likely scenarios assume that both active and passive mitigation systems operate as intended.

Chapter 11: TRI and RMP: What They Can't Tell You

In a perfect world, all the chemical hazard information now available under EPCRA and the RMP Rule would be accurate and understandable. Potential health effects would be readily discernible. Quantities, concentrations, and timing and duration of emissions would be reported with precision. How chemicals interact with each other in the environment would be understood. Humans would be foolproof in entering that information into readily accessible and digestible formats. But the real world of chemicals in the community is far from perfect.

Although EPCRA and the RMP program are powerful tools, they can't provide all the information a community needs to know about chemical hazards. Rather, think of EPCRA and RMP as a starting point.

TRI Data Limitations

EPA has been candid in acknowledging the limits of TRI data. Even assuming that the TRI data submitted by industry is outstanding in overall quality, reporters need to appreciate other caveats if they are to take advantage of the full potential of EPCRA for improving public understanding of chemicals in the community. Here are a few issues to keep in mind when reporting on chemicals in the community.

The Data Are Estimates, Not Monitored Releases

Remember that annual release data submitted to state commissions and EPA in the TRI Form R reports represent company estimates of the releases, not measured quantities.

The Timing of Releases Need Not Be Reported

Companies reporting their emissions need not indicate the timing of those emissions data over the course of the year. If all of a particular facility's air emissions occurred during a 6-hour period during the peak of an atmospheric inversion (an unlikely event), you'd never know it just by reviewing the Form Rs.

"There is a considerable difference, from a public health standpoint, if the emissions were in several major bursts or a slow but steady stream," Washington Post health writer Cristine Russell wrote. But there's no requirement that industries provide a seasonal, monthly, or weekly breakdown of how their 1emissions occurred, just the total over the calendar year.

Data on Human Exposure Is a Major Gap

One of the most critical elements missing from the TRl is information on human exposure to the chemicals released. Release does not equal exposure. Exposure occurs only when a chemical is transported from the site of the release to population centers.

Estimates of exposures can be made from estimates of releases if extensive site- and chemical-specific data are available, for example, height of an air release, wind speed and direction, distance to populations, and chemical persistence. These exposure estimates, obtained through computer models, are only as good as the data on release, meteorology, and chemical fate.

Reductions May Be "Real" or "Paper"

Reporters also need to pay attention to how the annual emission and release estimates were calculated. Calculation methods can vary from year to year ai1d from facility to facility. Some facilities will report emission reductions not as a result of actual reductions, but rather because they used a different method of calculating emissions. Beware of this possibility. Ask about the calculation methods and how any changes in protocol may have affected results. Ask what led to any reported reductions in emissions.

The List Is a Moving Target

In making year-to-year comparisons, reporters also need to pay attention to the chemicals that are removed from or added to the reporting list.

For example, calendar year 1987 reports include data on sodium sulfate releases and transfers. This chemical alone accounted for 54% of tot3.I releases and transfers for all TRl chemicals. Just one facility in California reported releasing 5.2 billion pounds of sodium sulfate-23% of total U.S. TRl releases and transfers.

In May 1989, EPA granted a petition to remove sodium sulfate from the list of chemicals subject to TRl reporting on the grounds that it was not of significant concern as a toxin.

With sodium sulfate included in the database, California led the list of states emitting TRI chemicals into the environment in 1987. Without it, California dropped to ninth position.

Over the years there have been many changes in the list. EPA added some 286 new chemicals in November 1994. Fortunately, EPNs annual "Public Data Release" reports have done a fairly good job of helping people compensate for such changes. EPAs reports give year-to-year comparisons for "core chemicals"-the ones that have been on the list consistently over the years, so that apples and apples can be compared.

This problem is especially worth keeping in mind when evaluating companies' claims of reducing their releases over the years. Make sure they are not claiming credit for reductions that have occurred because of delisting (or that they are not being unfairly criticized by environmentalists for increases that result from additions to the list).

The Facilities Covered Change

In May 1997, EPA added seven new industry sectors to the list of industries that must perform TRI reporting. These sectors included certain metal and coal mining facilities, electrical utilities, hazardous waste disposal facilities, chemical facilities, petroleum facilities, and solvent handling facilities. If you are making year-to-year comparisons, you will have to adjust for this change.

Chemical May Have Many Names

Chemicals can have aliases, synonyms, and multiple identifying numbers. It is a confusing world. If reporters use a popular name or a trade name, for instance, they may be missing all the other names under which a chemical is reported. Even the Chemical Abstract Service (CAS) number is not a guarantee of accuracy.

The Scope of Coverage Is Limited

Be aware that only a small fraction of all potentially toxic chemicals are covered by EPCRA reporting requirements. Moreover, these reporting requirements do not apply to all the facilities using and storing chemicals-just to those with 10 or more employees in specified standard industrial classification codes, specifically including manufacturing facilities. Only those facilities manufacturing more than 25,000 pounds or using more than 10,000 pounds annually of an affected chemical (with some exceptions) must submit Form Rs. Accordingly, the TRI database may say a lot about toxic emissions nationally, but it clearly understates the total amounts of those emissions.

RMP Data Limitations

While RMP information 1adds significantly to the amount and types of chemical information available, it too has limitations.

Not All Hazardous Substances Are Covered

Relying on the RMP to catalog community chemical hazards will miss some of the hazards. RMPs aren't required to be filed by a variety of facilities using hazardous chemicals such as propane, explosives, and some petroleum products.

Just because a facility or process is not required to file TRI or RMP information doesn't mean your community does not have to worry about chemical dangers.

Propane, for example, is frequently involved in accidents causing casualties from fire or explosion. However, as a result of the 1999 Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act, most propane dealers are exempt from RMP requirements.

If you rely only on RMP data, you might miss significant propane ·hazards. Almost every c9mmunity has some propane facilities, and although many are small, it may be worth looking into.

Not All Scenarios Are Listed

The RMP's listing of worst-case and alternate scenarios is an important description of things that could go wrong. But it is not the only description. The worst-case scenario is the most catastrophic, but the least likely event.

Only a few alternate scenarios need to be included in an RMP, but there may be many ways that safety-critical systems can fail in a complex chemical plant.

Additional information maybe alluded to in the accident prevention program section of the RMP. Ask the facility for their PHA or hazard review to find out more.

Chronic Risks Are Not Addressed

The RMP is particularly aimed at identifying the hazards of sudden, catastrophic spills, releases, fires, and explosions.

Communities also face potential hazards from chronic exposure to lower levels of the same chemicals.

TRI quantifies the releases of many of these chemicals, but it does not estimate human exposure or health consequences. EDF's Chemical Scorecard has taken a step further in this direction by publishing some exposure estimates EPA doesn't publish.

Transportation Hazards Are Not Included

Most hazardous chemicals must be transported to or from facilities. Transportation and disposal of hazardous chemicals (which are regulated under the Hazardous Materials Transportation Act of 1975, the Hazardous Materials Transportation Uniform Safety Act of 1990, and other laws), may be a source of hazards.

Transportation accidents are about as common as accidents at fixed facilities, according to the CSB. DOT and EPA databases are available that can give you some information about what is going on. Much of the transportation and disposal data are in the public record and can be found within DOT's Hazardous Material Incident Reporting System.

Not All Health Effects Are Known

Scientists don't really know the health effects of human exposure to many of the hazardous chemicals in industrial use today.

The EDF's Toxic Ignorance report, published in 1997, found that health information was lacking for three-quarters of the chemicals in high-volume production use today. The "High Production Volume" initiative launched by EPA and industry in 1999 is designed to assess potential health effects, but results are years away.

Only a Summary of the RMP Must Be Submitted

While the RMP Rule requires companies to conduct numerous accident prevention response activities and to maintain a comprehensive record of its program, only a summary of this information must be submitted to EPA and disclosed to the public. For example, the law and rule require facilities to conduct a thorough PHA or review to identify all possible hazards at the plant. RMPs must include --

- The date of the most recent hazard review
- Expected completion dates for any changes resulting from it
- Major hazards identified and process controls in use
- Mitigation systems in use
- Monitoring and detection systems in use
- Changes since the last hazard review

But the summary submitted to EPA has only the date on which that review was conducted. That means all that reporters and the public can get from EPA electronically is the date-that is all that EPA has. The date alone is of modest help to communities in understanding the nature and magnitude of potential dangers. The PHA itself might be much more useful.

Chapter 12: Tips on Getting Offsite Consequence Information

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act limits the distribution of RMP OCA data and prevents access for at least 1 year to a searchable, national, electronic database that could be posted on the Internet.

However, there are a number of possible ways to get information on facilities' potential offsite consequences. Facilities are allowed to disclose their own OCA information. Most of the facilities are required to hold a public meeting to discuss their RMP, including a summary of OCA information. Some companies have included a summary of their worst-case scenario in their RMP executive summaries. Some information may be available from state agencies, the LEPCs, or the EPA regional offices.

Getting Information from LEPCs and SERCs

For local stories, LEPCs and SERCs are usually key sources, but much depends on the capabilities of the particular agency you are dealing with. It is worth getting to know your LEPC, because it may consist of individuals, such as a local fire chief or HAZMAT responder, who can help you on all kinds of chemical release and emergency stories. LEPCs vary considerably. In some states, LEPCs scarcely exist, but parallel agencies under unique state laws take their place. In other states, a single LEPC may cover a large region or the whole state. Keep in mind that their staff resources are limited. Although SERCs and LEPCs are required by federal mandate, they typically do not receive any federal operating funds. Also be aware that some LEPC members may identify with the interests of local chemical companies. In addition, the reporting facility may actually be a municipal water or sewage plant, and a sister municipal agency on the LEPC may act protectively.

LEPCs and SERCs may have information that EPA does not. An example is the Tier II information facilities may make available under EPCRA. Once the LEPC has the information, they are required by EPCRA to make it available to the public on request. Moreover, if the public requests Tier II information that the LEPC does not have, the law strongly encourages the LEPC to request it from the facility.

Getting Information from Facilities

The horse's mouth, when it comes to information on hazardous chemical discharges and emergencies, may be the company or facility itself. It knows more about its own operations than anyone.

During the 1990s, many facilities handling hazardous chemicals opened themselves up to public scrutiny to a degree previously unimaginable. The chemical industry as a whole also appeared to open up in important ways. In the late 1980s, just before the EPCRA requirements kicked, the Chemical Manufacturers Association established a program called Responsible Care®. It amounted to a code of conduct that stressed continuous efforts at risk reduction, proper disposal of wastes, and openness to public scrutiny.

Many plants have thrown themselves into this effort wholeheartedly. Typically, they tend to be major plants of major companies: well financed and managerially and technically competent. It is worth remembering, however, that many small companies are not involved in Responsible Care®.

Attending Public Meetings

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act requires facilities (except those under Program 1) to hold a public meeting to summarize their RMP including OCA information. Small companies may publicly post the information rather than hold a meeting. Even before the June 1999 deadline for RMP submittals, many companies were going public with RMP information. Groups of companies in various cities put on "rollouts" of their RMPs with press conferences and information on each company. While the companies can claim credit for initiative and openness in these events, critics in the environmental movement dismiss them as public relations exercises aimed at putting a preemptive positive spin on RMPs and limiting hostile questioning.

The key to good reporting on RMPs is getting beyond the press packets and asking probing questions. Use public data to generate questions. Ask to inspect the plant or go on an inspection tour when community and environmental groups take one. Having an outside expert with yot'.1 during the tour might help. The "safety information" and "hazard review/analysis" documents generated during the PSM and RMP processes will be a gold mine of information. While companies are not legally required to disclose all of this information, ask to see it. A company's response to such requests may reveal a lot about their commitment to openness with the public.

Finding Other Information Sources

Local community action and environmental groups can be great sources of information on what companies are doing. They may be active in monitoring companies' actions and scrutinizing procedures and operations. Union representatives may be able to provide information related to worker safety and training. Other potential sources of information and insights may include a company's suppliers and vendors and individuals living near a facility.

Information submitted under other laws and regulations can also be useful. For example, CERCLA requires that facilities notify the NRC, EPA regional offices, the SERC, and the LEPC of chemical releases. There are federal and state plant siting and air emission requirements, and. some states have additional reporting and right-to-know requirements. Determining whether all required information has been submitted to the appropriate entity, and the extent to which reported values agree, can provide an indication of the reliability of particular RMP information.

Chapter 13: Some Issues for Journalists and LEPCs

EPCRA specified that LEPCs should include representatives of the media among their membership. However, relatively few committees have managed to include reporters as members. This was not simply the result of reluctance on the part of LEPCs, nor was it the time pressures of reporters' jobs. It was partly a matter of professional ethics. The law's vision of reporters as partners in a community education enterprise conflicted with the media's vision of journalists as independent, disinterested observers. A reporter could have a hard time writing objectively about the proceedings of a committee of which he or she was a member. However, the reporter who writes about the LEPC does not need to be the same one who sits on the LEPC.

LEPCs need critics. Some are failing to plan effectively for community safety. Yet few newspapers and stations have held LEPCs to account by examining how well they are doing their job or how they might do it better.

In the years since EPCRA was passed, the so-called "civic journalism" movement picked up steam in the United States. In a nuts**hell, its premise was that media had a responsibility to be more actively involved, and to get the public more involved, in government policy decisions. The idea was that people needed to understand the choices that government was making and that government needed to understand what the people thought should be done. Journalists can do this job on or off an LEPC.**

Reporters and Emergency Preparedness

Does the media have a responsibility to educate the public about how to protect themselves, even if there is no immediate news hook? A legitimate argument could be made that it does. In addition, discussions with LEPC members and others could result in all sorts of stories.

When hazardous chemicals are involved, an unprepared community may well be a community in danger. For example, do people know when and how to shelter in place? If evacuation is called for, will people be alerted quickly? Will they know if evacuation routes are choked with traffic? Do people know what the plant's emergency siren sounds like? Can they hear' the sirens indoors? If the plant has an automatic phone-dialing system to alert neighbors, does it work? Would a new bridge or ramp speed evacuation? Do local hospitals have enough capacity and skill to handle a chemical disaster? Are their disaster plans adequate?

Good preparation can cost money. While LEPCs may be reticent to propose costly solutions, the news media may be better situated to ask aggressive, unsettling questions about chemical emergency preparedness and to help the public understand the risks and the options. The news media can play an important role in chemical safety-building public awareness, and promoting prevention and preparation efforts that will lead to greater public safety.

The One Important Question

In the end, there may be only one important question that your audience or community' wants answered more urgently than any other does: Am I safe? Are my children and family safe? If you get lost in the details and technicalities of EPCRA and RMP data, you may easily lose sight of the question and the answers to it, in human terms.

EPA has tried to focus on this question. One way it has done this is by stressing the general duty clause of the CAA. This provision states that facilities have a general duty' to operate safely, whether or not they are handling listed chemicals or are covered by the specific requirements of the RMP Rule. So if you think a facility is doing something unsafe, and it tells you everything is perfectly legal because the RMP Rule doesn't cover the facility or allows the behavior, don't necessarily believe it.

People want a yes-or-no answer to the "Am I safe" question, and the most authoritative answers tend to fall somewhere between "probably" and "probably not." Sometimes a crusading reporter or environmental group tends to think that once they have identified a previously unknown hazard, they have discovered a "truth" that the public needs to know about. The public certainly needs to know about potential hazards. And while alarm is a great way to drive up ratings and readership, realism is just as important. The journalist's responsibility is just as much to avoid excessive alarmism as it is to avoid excessive complacency.

A Focus on Prevention

A lot can be done to make most plants that handle hazardous chemicals safer. Safety is something that can be designed into a facility or process and built from the ground up. When processes are inherently safe, human error or equipment failure is much less likely to result in a disaster: Making processes safer might require redesign or substituting less-hazardous chemicals for more-hazardous ones. It might mean maintaining smaller chemical inventories. It might mean moving at-risk populations away from plants by buying up properties within a buffer zone.

Writing a story that scares people and blames someone is easy. It is easy to write and easy for people to understand. It is much harder to write about what can be done to make a hazard safer, because it requires more detailed understanding and often complex and difficult choices. The answer to the "Am I safe?" question is ultimately written not in the present tense, but in the future tense. The answer comes not just from alarm, but from knowledge and action.

Glossary

Active mitigation: Equipment, devices, or technologies that need human, mechanical, or other energy input to capture or control released substances (e.g., interlocks, shutdown systems, pressure relieving devices, flares, emergency isolation systems).

Acute toxicity: The ability of a toxic substance to cause serious adverse health effects shortly after exposure.

ANSI: The American National Studies Institute, which is the organization that coordinates development of national, voluntary standards for a wide variety of devices and procedures.

ASTM: The American Society for Testing and Materials, which is a developer and provider of voluntary standards.

CAA: The Clean Air Act. Section 112(r) of the Clean Air Act includes requirements for establishing the RMP Rule and other related activities.

CAS Registry Number: A unique identification number assigned to a chemical by the Chemical Abstracts Service, a division of the American Chemical Society.

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund, which established requirements for closed and abandoned hazardous waste sites and for liability for releases of hazardous waste sites. CERCLA authorizes EPA to respond to releases of hazardous substances that may endanger human health or the environment.

CHEMTREC: The Chemical Transportation Emergency Center is a hotline operated by the Chemical Manufacturers Association. It provides advice on responding to chemical transportation emergencies.

CSB: The Chemical Safety and Hazard Investigation Board, commonly referred to as the Chemical Safety Board or CSB, is an independent, federal agency whose chief mission is to improve chemical safety by protecting workers, the public, and the environment from the dangers of chemical related accidents. It was established under section 112(r)(6) of the Clean Air Act.

Chronic toxicity: The ability of a toxic substance to cause adverse health effects from repeated exposure over a relatively prolonged period of time.

Distance to endpoint: The estimated distance from a point of toxic release to the point where it is no longer considered hazardous to people.

Dose: The quantity of a chemical to which an individual is exposed over a given period.

Environmental receptors: As used in the CAA, a natural area that could be exposed to a chemical hazard as a result of an accidental release (e.g., national or state parks, forests, or monuments; wildlife sanctuaries and preserves; wildlife refuges; and federal wilderness areas).

Extremely hazardous substance: A substance identified under EPCRA whose release may be of immediate concern to the community because of its irreversible health effects.

EPCRA: The Emergency Planning and Community Right-to-Know Act of 1986 (Title 'm of the Superfund and Reauthorization Act of 1986 or SARA Title III) established chemical emergency planning and community right-to-know requirements for federal, state, and local governments and industry.

ERPG: Emergency Response Planning Guidelines, which were developed by the American Industrial Hygiene Association. ERPG values provide estimates of maximum airborne concentrations of toxic chemicals that most people could be exposed for up to 1 hour without developing certain health effects.

Exposure: Whether and how a human or other organism comes into contact with a chemical-usually by eating or drinking it, inhaling it, or touching it and having it penetrate the skin.

General Duty Clause: The section of the CAA that directs owners and operators of facilities producing, using, handling, or storing hazardous substances (whether or not they are regulated under the RMP Rule) to design and maintain a safe facility, to prevent accidental releases, and to minimize the consequences of any that occur.

Hazard: Something that is capable of causing harm. For chemicals, the inherent properties that represent the potential for personal injury or environmental damage that can result from exposure. The severity of the hazard often depends on its concentration and exposure.

IDLH: Immediately dangerous to life or health values are the maximum airborne concentrations of chemicals to which healthy adult workers can be exposed for 30 minutes and escape without suffering irreversible health effects or symptoms that impair escape. IDLH values are set by NIOSH.

LEPC: Local emergency planning committees are groups established by EPCRA to coordinate the development of community chemical emergency plans and coordinate to communicate the plans to local stakeholders.

List Rule: The List of Regulated Substances and Thresholds for Accidental Release Prevention (40 CFR 68.130) identifies acutely toxic substances and highly volatile, flammable substances that are regulated under the RMP Rule.

LFL: The lower flammability limit is the lowest concentration in the air at which a substance will ignite.

MSDS: A Material Safety Data Sheet contains information related to the particular hazards of a chemical and protective measures.

NAICS Code: The North American Industry Classification System is the new standard coding system to categorize businesses and industries. It replaces the Standard Industrial Classification (SIC) code system.

OCA: The offsite consequence analysis is a determination of the potential effects of a chemical accident in the area surrounding the facility property.

OSHA: The Occupational Safety and Health Administration establishes standards to protect employees from workplace injuries and illnesses.

Passive mitigation devices: Equipment, devices, or technologies that function without human, mechanical, or other energy input to capture or control released substances (e.g., building enclosure, dikes, and containment walls).

Potency: The toxicity of a chemical that is the ability of a chemical to do systematic damage to an organism.

ppm: Parts per million is a unit used to express the concentration of a substance in air, water, or land. It is commonly used in establishing maximum permissible amounts of contaminants.

Process: Under the PSM Standard and the RMP Rule, any industrial activity involving a regulated substance, including any use, storage, manufacturing, handling, or onsite movement. Includes any group of vessels that are connected and separate vessels located where they could also become involved in a release.

Public receptor: Off-site residences; institutions (e.g., schools, hospitals); industrial, commercial, and office buildings; parks; or recreational areas inhabited or occupied by the public.

PSM Standard: OSHA's 1992 Process Safety Management of Highly Hazardous Chemicals Standard (29 CFR 1910.119) is intended to prevent or minimize the employee consequences of a catastrophic release of toxic, reactive, flammable, or highly explosive chemicals from a process. It served as a model for the RMP Rule prevention program' requirements.

Retail facility: A facility at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program.

RMP: The risk management plan is a summary of a facility's risk management program, as required under the RMP Rule.

RMP Rule: The Risk Management Program Rule is a set of regulations established under Section 112(r) of the Clean Air Act that provide guidance for the prevention and detection of accidental releases of regulated hazardous substances and preparation of RMPs.

RMP*Submit™: Software, available free from EPA, that facilities can use to submit RMPs.

SARA Title III: See EPCRA

SERC: The State Emergency Response Commission, which under EPCRA, each governor must appoint. The SERCs are responsible for appointing LEPCs, reviewing local emergency plans, and receiving chemical release notifications.

Shelter-in-Place: The practice of staying inside homes or other building to provide temporary protection from chemical releases rather than evacuating the area. It may include closing and sealing doors and windows and turning off heating and air conditioning.

SIC: Standard Industrial Classification codes were assigned to categories of U.S. industries and are referenced in the RMP Rule. They have been replaced by NAICS codes.

Stationary source: Any buildings, structures, equipment, installations, or related stationary activities that produce pollution; often facilities using industrial combustion processes. A fixed-site facility.

Threshold limit value: A workplace exposure standard -- the concentration of an airborne substance that a healthy person can be exposed to for a 40-hour workweek without adverse effect. The American Conference of Government Industrial Hygienists recommends occupational exposure guidelines.

Threshold quantity: The quantity of regulated chemicals, in pounds, specified in EPA's List Rule. Any facility that has more than the threshold quantity amount of a listed substance for use in a single process must file a RMP.

TRI: The Toxic Release Inventory is an EPA database of information about toxic chemicals used, manufactured, treated, transported, or released into the environment, based on reports submitted to EPA under EPCRA

Acronym List

1/10 IDLH	One-tenth IDLH
ACGIH	the American Conference of Governmental Industrial Hygienists
AIHA	the American Industrial Hygiene Association
BLEVE	boiling liquid, expanding vapor explosion
CAA	Clean Air Act
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act
CSB	Chemical Safety and Hazard Investigation Board
DOT	The Department of Transportation
EDF	The Environmental Defense Fund

EPA	The Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERPG	emergency response planning guidelines
FEMA	the Federal Emergency Management Agency
GIS	geographic information system
IDLH	immediately dangerous to life and health
IRE	Investigative Reporters and Editors
kw/m2	kilowatts/meter2
LD50	a dose that is lethal to 50% of the animals tested
LEPC	local emergency planning committee
LFL	lower flammability limit
mm Hg	millimeters of mercury
MSDS	material safety data sheets
NICAR	the National Institute of Computer Assisted Reporting
NIOSH	the National Institute for Occupational Safety and Health
NTSB	the National Transportation Safety Board
NRC	National Response Center
OCA	offsite consequences analysis
OSHA	the Occupational Safety and Health Administration
PHA	process hazard analysis
ppm	parts per million
psi	pound per square inch
PSM	Process Safety Management
RMP	risk management plan
SEER	National Cancer Institute's Surveillance, Epidemiology, and End Results
SERC	state emergency response commission
TLVs	threshold limit values
TRI	the Toxic Release Inventory
USPIRG	U.S. Public interest Research Group

MANAGING CHEMICALS SAFELY: PUTTING IT ALL TOGETHER

HOME

CHEMICAL ACCIDENTS -- THEY DON'T HAVE TO HAPPEN

Businesses that use hazardous chemicals can prevent accidents-if they have the right information. And ... know how to apply it. It's up to industry, large and small, to manage chemicals safely. But an effective, integrated approach to prevention involves a whole network of other players, too: fire and emergency services, trade-associations, labor organizations, professional societies, government at all levels, insurance companies and financial lenders, the environmental community and other public interest groups, and the media.

Sharing information across this network is what makes prevention work. This publication is one piece of that information mosaic. It shows owners and managers of smaller enterprises how to get started in chemical safety management. It gives basic definitions and describes the benefits. It suggests initial steps and recommends sources and resources for additional information.

You can help spread the word on safety. Please share this publication with your colleagues. Mention ''Managing Chemicals Safely" in your meetings, newsletters, journals, indexes, electronic bulletin boards, training sessions, workshops-even on your coffee break.

Working co-operatively, we can all help make our world a safer place.

A SHARED RESPONSIBILITY

In recent years society has come to recognize that environmental safety is everyone's job. Industry, workers, governments, trade associations, environmental groups, local communities, and other "stakeholders" all share in this responsibility, just as they all benefit from a safer environment.

With that shared obligation in mind, these various stakeholders have been participating in focus groups and roundtable discussions sponsored by the U.S. Environmental Protection Agency's Chemical Emergency Preparedness and Prevention Office (CEPPO) to address the issue of reducing chemical risk in the community.

This publication, intended to introduce smaller businesses to the practice of chemical safety management, is a result of those meetings.

The sponsors recognize that the main responsibility for chemical safety lies with those who work with hazardous materials every day, in thousands of businesses all over the nation. Our hope is that this publication will stimulate owners and managers of smaller companies that use hazardous chemicals to learn more and do more about chemical safety management and to understand that safety should be among their highest priorities.

CHEMICAL SAFETY MANAGEMENT: It's Not Just a Catch Phrase, It's Good Business

It's always easier to figure out why an accident happened after it occurs. Two seemingly unrelated events combine to produce an explosion, an injury, a chemical spill. Bad luck, you think.

If only the regular operator hadn't been out sick the day the chlorine tank was filled, or that valve hadn't stuck open, maybe we wouldn't be in this mess.

Bad luck, or bad planning?

More and more, companies that use hazardous chemicals are turning to an approach called chemical safety management as a way to fight ''bad luck" with good planning. Chemical safety management -- also known as chemical process safety management or risk management planning -- can help you identify potential risks at your site and establish an organized method for reducing those risks.

It's not a formal procedure so much as a way of doing business, an integrated philosophy that considers your entire operation rather than just pieces of it. Chemical safety management involves everyone in your company, day in and day out. And it works.

Most companies that deal with hazardous chemicals probably have many of the ingredients emergency response plans, safety training, and the like -- already in place.

What's new about the chemical safety management approach is that it takes these existing measures, plus a few more and integrates them into a co-ordinated system backed by a strong commitment from top management.

A good chemical safety program is more than just a stack of documents gathering dust on the shelf. It's a living, evolving, vital element of your business.

Know your operation: the hazards of the materials you work with, of your equipment, and of your processes. Identify safety requirements, and analyze your weaknesses and capabilities.

IS THIS REALLY FOR ME?

You don't have to be a large chemical manufacturer to put a program like this into effect. Dry cleaners, small machining shops, food processing plants -- anyone who uses hazardous chemicals can benefit from chemical safety management. The program can vary from company to company, but all programs have several basic principles in common:

- Taking an inventory of your hazardous materials
- Reviewing your entire process, from piping and instrumentation to operational procedures
- Conducting detailed studies to identify potential hazards, to assess the likelihood of accidents, to evaluate the potential consequences, and to address the serious problems first
- Establishing and following a regular preventive maintenance program
- Developing standard operating procedures and training programs for employees
- Managing changes in the operation so that a change in one part of your process doesn't cause an accident somewhere else
- Investigating and documenting accidents and near-accidents
- Developing emergency response plans for your company and co-ordinating them with local emergency planners
- Sharing information with the local community

A key principle of chemical safety management is that all these steps have to be part of your everyday operation, which means that the commitment to safety has to include everyone in the plant, starting at the top. And it has to be more than just lip service from the boss.

Too often, information on chemical hazards is known only to the shop manager, or is locked away in a file drawer where no one ever sees it. Keeping the information just within the plant won't do that much for safety, either. Certain information should be shared with the plant's neighbors in the surrounding community. In fact, your business should be aware of federal as well as some state laws that require specific information on hazardous chemicals and their risks to be made available to the public. "Be sure to share your emergency plan with plant neighbors," cautions Paul Orum of the Working Group on Community Right-to-Know, a coalition of environmental groups. "You can bet they will want to see your plan after an accident." Good chemical safety management requires that everyone be in on the plan -- not just the company's safety manager.

CHEMICAL SAFETY MANAGEMENT IN A NUTSHELL

- THE RIGHT ATTITUDE: Commitment from every single member of the company is essential to making chemical safety management work.
- KNOW YOUR OPERATION: Know the hazards of the materials you work with and of your equipment. Identify safety requirements and existing capabilities and weaknesses. Correct the problems and implement appropriate procedures and practices.
- REDUCE YOUR HAZARDS: Find ways to make your operation safer. You could reduce your inventory of hazardous substances, find less hazardous substitutes, or change your processes.
- PEOPLE ARE THE KEY: Train your work force in proper procedures and practices, develop task requirements for employees and contractors, and update training to keep up with changes.
- TAKE CHARGE OF CHANGE: Any change in one part of your operation may affect other parts. Plan accordingly.
- PROTECT YOURSELF: Keep equipment in top shape, inspect and. maintain it faithfully, conduct regular safety reviews, and have a working emergency action plan and appropriate emergency equipment available.
- LEARN FROM MISTAKES: Investigate accidents and near accidents, determine the causes, and make whatever changes are necessary to prevent them from happening again.
- BE A GOOD CITIZEN: Work with the community and with local emergency planning officials to reduce chemicals risks.
- ONCE IS NOT ENOUGH: Managing chemicals safely is a continuing process. It's not a document on a shelf; it's an everyday part of running your business successfully.

BUT I ALREADY HAVE A SAFETY PROGRAM!

Most responsible companies have some kind of worker safety program already in place. That isn't the same as making sure your staff understands and can handle chemical risks, however. And just because one part of your operation meets safety requirements, it doesn't mean your entire business -- or the surrounding community -- is safe. You might be storing a particular chemical safely but running it through inadequate piping. Or you've bought a new plating tank but haven't gotten around to training your workers in how to load it properly. A good safety management program makes it impossible to overlook the way these things are interrelated because it takes in your operation as a whole.

Don't let the terminology used in chemical safety management programs scare you, says Sanford Schreiber of the American Institute of Chemical Engineers' Center for Chemical Process Safety. "I'll ask people if they ever did a hazard analysis, and they say, 'What are you talking about?' Then I say, Well, have you ever put down on a piece of paper what hazards you could confront, how they could happen, and what are the precautions you need to take so they don't happen?' Then hazard analysis makes a little more sense.”

Because chemical safety management requires that you step back and take a thorough look at your entire business, it's an exercise that will serve any manager well. Instead of just reacting to every accident or near-accident after it takes place, you learn to identify the early warning signs of potential mishaps and shutdowns so that you can take action before they occur. The result is a safer operation, greater efficiency, and increased productivity.

And that's good for everyone.

"Chemical safety management ·encompasses safe practices, product stewardship, informing the public -- all these and more,” says Jim Makris, Director of EPA’s Chemical Emergency Preparedness and Prevention Office. ''What it really means is that people in the business of handling hazardous chemicals -- whether they use, store, process, or distribute the them -- coming to recognize that safety is not at the bottom of their list of responsibilities. It's at the top.

WHAT YOU SHOULD KNOW ABOUT THE 1990 CLEAN AIR ACT AMENDMENTS

Chemical safety management is a good idea for any business that uses hazardous materials. And for some businesses, it will no longer be optional.

The Clean Air Act Amendments of 1990 require the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSBA) to develop regulations for chemical safety management. Companies that have certain chemicals above specified threshold quantities will be required to develop a system to identify and evaluate hazards and to manage those hazards safely. The purpose of the requirements is to prevent accidental releases and mitigate any releases that do occur. Information that companies develop on their hazards will he submitted to states and. Local emergency planners and will be available to employees and to the public.

For more details on the accidental release provisions of the Clean Air Act Amendments of 1990, call EPAs Emergency Planning and Community Right-to-Know Information Hotline at (800)535-0202 or OSHA's Public Information Office at (202) 523-8151.

WHAT'S IN IT FOR YOU: Unexpected Benefits

It doesn't matter whether you're a large or small business -- if you use, manufacture, or store hazardous chemicals, your plant is vulnerable to accidents and other problems that can be minimized through the chemical safety management approach.

The worst accidents result in injury or death, and almost all cost money. Think of what published cost figures for an accident don't include: downtime, increased insurance costs, and loss of customer business or confidence.

HIDDEN SAVINGS

Preventing accidents isn't the only reason for establishing a chemical safety management program, however. It may not even be the best reason, says Ray Brandes, retired director of safety for ICI Americas. "Process safety management is intended to help you recognize, understand, and control all of your process hazards. If you do that, you're going to understand your whole business. And once you understand and control your business, it runs better. You don't have quality fluctuations. You don't have shutdowns. It runs continuously, it's more efficient, and your quality's higher.”

A good chemical safety management program can help ensure that you don't find yourself paying for property damage, lawsuits, insurance hikes, medical bills, and fines resulting from an accident that could have been avoided.

Some benefits are obvious and tangible. Preventive maintenance, for example, pays off in improved efficiency. Machines don't keep breaking down, and, like well-maintained cars, they last longer. Other benefits aren't so tangible.

For example, the analysis required to set up a chemical safety management program can help a new business by identifying and solving problems ahead of time. When your operation comes online, it does so smoothly, without hitches, and often reaches full production sooner than if no analysis had been done.

Chemical safety management is directly linked to worker safety, says Gerard Scannell, former Assistant Secretary of Labor for Occupational Safety and Health. "Safety in the workplace is our first line of defense against chemical disaster in the environment,” notes Scannell. And worker involvement in any safety program has to be "more than superficial,” says Jim Valenti of the United Steelworkers of America. It can be formal or informal, and where there is a structure, such as a labor-management committee, this resource should be tapped. ''With complex chemical reactions,” says Valenti, "one has to understand what's going on rather than just know which valves to open and close.”

TAPPING WORKERS’ WISDOM

The documentation that goes along with a good chemical safety management plan also takes full advantage of the knowledge and experience of your work force. One manager points to the example of a paper mill where his youngest employee had been on staff for 20 years. These "old-timers" were able to transfer much of the knowledge that was in their heads -- knowledge that otherwise would have been lost when they retired -- into a form everyone could use.

Businesses that open up the lines of communication between workers and technical staff find that workers can make important contributions. ''Workers tend to have an inherent knowledge of the conditions of their work," says Valenti. "They may not have the technical terminology to explain what's going on, but some of these operators can tell you a bearing is giving out on a pump two floors down just by listening to the hum."

'Similarly, communication between companies that handle hazardous chemicals and the outside world is critical. Mike Callan, former captain of the Wallingford, Connecticut Fire Department, encourages chemical businesses in his community to include firefighters in employee training sessions. "It can really benefit your company;' says Callan, "when the fire department is familiar with your business and the way it operates."

This emphasis on the "people factor" in chemical safety management often has a real payoff in terms of efficiency and employee morale. One manager who set up a safety program in a small chemical products plant recalls that "with the new energy devoted to safety management, we found that we developed efficiencies because we had to."

Wayne Tamarelli, chairman and CEO of Dock Resins in New Jersey, says, "I'm a true believer in safety, not so much from a dollar point of view as from a people point of view. The big saving from safety expenditures is that you prevent people from getting hurt and harmful materials from being released."

FROM PRINCIPLES TO PRACTICE: Chemical Safety Management in the Real World

Chemical safety management makes sense on both the production line and the bottom line. But it isn't always easy.

In fact, when Bill Toth first introduced a comprehensive safety management program to his 70-employee, agricultural products plant outside Houston, he says it was "easy to be overcome by the magnitude of it."

But three years later, Toth swears by the result. Other managers who have set up similar programs in their companies will tell you the same story: Stick with it, they say, and the payoff will come. It may be hard to quantify, but it's real.

That doesn't mean the programs are generic, though, or that one size fits all. You have to take a look at your own operation, and your own specific needs. Setting up the right chemical safety management program will depend on what kinds of hazardous materials you handle, how you use them in your business, and other variables, including the complexity of your operation.

Chemical safety management reflects society's concern for safety and environmental issues. And -- it can help your business be more efficient and competitive.

TAKING STOCK: WHERE TO BEGIN?

For businesses that are already up and running, the first step may be a detailed walk-through of your operation, along with an inventory of all chemicals on site. Dozens of .questions will have to be answered: Which materials are hazardous? Are you currently handling and storing them safely? What are the regulations regarding their use and release into the environment? What about the integrity of piping, seals, and storage tanks? Is everything fully documented?

For the small business owner who's been in business a long time, a thorough safety survey can be illuminating as well as challenging. Familiarity with hazardous materials often breeds complacency, and even the most experienced workers may gain a new appreciation for all of the potential risks. You may even discover hidden savings. Bob Brooks, a safety engineer with Amtrak's Philadelphia division, says that after conducting an inventory of hazardous chemicals on his site, he was able to reduce the number of hydraulic fluids he uses from ten to three. Now he's saving money -- there are fewer storage and handling worries and not as many chemicals for the workers to learn how to use safely.

Who conducts this kind of review depends on the nature of the business. Abe Vizhansky, who runs Allied Metal Finishing, a 40-person plating shop in Baltimore, was able to do much of the analysis himself, relying on his years of experience as a chemist. But a more complex operation might require one or more people assigned to the job full-time, or even an outside consultant. Being small can be an advantage. In a small company, the employees are likely to be closer to the processes they're working with, and there's probably a good amount of expertise already on hand. Workers on the shop floor have a great sense for what's really going on there. One technical expert familiar with chemical safety management cautions, however, that particularly in smaller operations, "there's typically a documentation problem because often a small company just doesn't have the resources to get everything down on paper. You have to do the best you can with what you have."

WHAT DANGERS LURK?

After taking stock of your overall situation, the next step is to take a detailed look at what accident risks you're facing. Practicing chemical safety management means fully understanding all the possible hazards at your facility, beginning with the materials themselves.

Material Safety Data Sheets (MSDS), required by OSHA rules to be furnished by chemical suppliers, should list toxicity, flammability, reactivity, and other critical data for each chemical on site. This kind of information can alert a user to the dangers of, say, mixing chlorine and ammonia, or putting a corrosive acid in a copper-lined tank. Likewise, all equipment and operations should have their own specifications for pressure, temperature, and other values.

The next step is to make sure those operating parameters -- and the consequences of not staying within them -- are clearly understood by all responsible personnel. It's not enough for the boss to understand the hazards on your site. They need to be communicated in a way that all employees can understand.

Hazards analysis goes beyond just listing the dangers of each individual chemical you use. It takes into account your entire operation -- all the on-site hazardous chemicals, equipment, and people -- and how they interact with each other. What's the worst accident that can happen, and how likely is it? There are many different ways to do a process hazards analysis, but they all have the same general purpose: to identify all potential hazards, estimate the likelihood of occurrence, and evaluate the consequences if they were to happen. Whatever methodology you apply, you may need to seek the advice of an outside expert. Insurance investigators, trade associations, professional societies, and larger companies that use the same chemical process also can help.

Take a good look at your own company with a thorough safety survey. Then study what risks you might be facing. Most important, understand how your company's equipment, processes, hazardous chemicals, and people are all interrelated.

"TRAINING, TRAINING, TRAINING"

People are vital to the chemical safety management approach. As Bill Toth says, "All personnel must be part of the program – no observers.” This means that each employee should know how his or her work fits into the big picture.

Train your people thoroughly, advises Bob Brooks of Amtrak, and tailor the training to their level of education. If it takes extra time to present information in a way that employees will remember it, be sure to budget for that time – just because someone sits through a four-hour class doesn't mean they retained four hours' worth of information. And one more critical thing you can't leave out is an evaluation of the training itself. Be prepared to determine just how effective it is. Classroom education and videotapes are certainly valuable, but hands-on training is the best, say the experts, and the more practical, the better. Larry Schongar, vice president of operations at Jones Chemicals, a chlorine repackaging company in New York, also recommends giving monthly refresher courses after initial training is finished, to make sure the information sinks in. The key to any good chemical safety management program, he says, is "training, training, training.”

CHANGE ONE, CHANGE ALL

Chemical safety management demands that you think of your operation as an integrated whole. If, for example, you replace older valves with a new type of valve, the resulting changes in pressure or flow may be too much for downstream valves or piping to handle safely. When you make changes, it's important to think through and record the effects of those changes on your whole process and take appropriate corrective measures. The changes in the operation can change the hazards in the system you're looking at. Remember that your hazard analysis must be based on the real conditions in your plant and must take into account any modifications you made.

AN OUNCE OF PREVENTION

The value of preventive maintenance is obvious. But the trick is actually doing it. Make sure your equipment and facilities -- particularly critical parts of the operation that pose the greatest potential risk -- are in top shape when they're installed. Then make a schedule for regular maintenance, and stick to it. The manufacturer should be able to provide specific recommendations as to what parts of the equipment should be inspected and how often.

At longer intervals, or whenever you install new equipment, you should also review your equipment, procedures, and personnel to make sure everything's still operating according to plan. Keep track of your preventive maintenance actions so you can check them against your schedule.

A mishap occurs. A key part of chemical safety management is investigating the near-misses to prevent the same thing from happening again.

LEARN FROM MISTAKES ...

A mishap occurs. It might have been worse, but fortunately no real harm was done. Rather than just breathing a sigh of relief and getting back to work, a key part of chemical safety management is to investigate potentially dangerous incidents or emergencies to determine the nature of the incident, its direct and indirect causes, and changes to prevent the same thing from happening again.

It's even important to investigate near-misses. Documenting small mishaps, even if they're not serious, can reveal patterns and suggest solutions. John Wilbeck, who directs safety operations at a mid-sized Monsanto plant in Houston, points to a series of minor incidents that occurred once at his site.

"They didn't cause any equipment damage, they didn't cause any injury, but they were incidents," he says. In time Wilbeck's crew was able to find the cause. But it was only through methodical record-keeping that the pattern was detected.

''If incidents happen two months apart, you might forget what happened," says Wilbeck. "But if you investigate, write up a report, and come up with a cause, then it becomes more evident when you've got a recurring problem."

THREE THINGS YOU CAN DO RIGHT AWAY

1. Make the commitment to chemical safety management, and have everyone -- from the head office to the shop floor -- agree on written goals and a written timetable. Sounds obvious, but this is probably a critical first step.
2. Get more information. If you're a small shop, gather as much free and low-cost advice as you can, whether it's sending away for literature or MSDSs or attending a meeting of the Local Emergency Planning Committee (LEPC). Help often comes from unlikely places. Your insurance carrier, for example, has almost as much of an interest in preventing accidents as you do, and may offer valuable advice at no extra cost.
3. Walk through your shop. Make a quick, initial survey to help determine what kind of a job you're facing. How much documentation is already on hand? How much will you need to produce from scratch?

... BE PREPARED...

No chemical safety management program is 100 percent guaranteed, and even in the safest business, something, sometime, is bound to go wrong.

That's why, when an accident does happen, you need to have an emergency action plan in place so you can respond quickly and efficiently without making a bad situation worse. Make sure the entire staff is familiar with this plan (regular practice exercises help), and that you have all the emergency equipment and information you need within easy reach.

You may already be required to provide the local fire department with information about your site's hazardous materials, but make sure those materials are easy to identify in the event of a real emergency. Clear labeling is essential: You may know that a particular drum contains an explosive substance, but will firefighters know it when they show up at your door in answer to an alarm?

When setting up an emergency response plan, similar companies in the same geographic area may want to pool their resources.

Your Local Emergency Planning Committee (LEPC) can also give valuable advice, help you "network" with organizations responsible for community safety in your area, and even assist in setting up practice exercises.

LEPCs were established under the 1986 Emergency Planning and Community Right-to-Know Act, as a means for local government, law enforcement, health, and rescue officials to work together with industry, the media, and community groups to draw up formal plans for dealing with chemical emergencies.

LEPCs vary in size from state to state. Call your State Emergency Response Commission (SERC) to find the LEPC in your area, or contact the local fire department – they should be able to put you in touch with the committee in your district.

Mike Callan, former captain of the Wallingford, Connecticut, Fire Department, explains why good communications with the community are important: "In an emergency, emotions are high. If that's the first time [the public] finds out there are 40,000 gallons of vinyl cyanide stored in their community, they won't be happy."

It pays, therefore, to have emergency responders, the community, and chemical facilities knowledgeable of each other's business -- before an accident occurs.

... AND BE PATIENT!

These tips will help the novice get into chemical safety management, but real success comes only with an investment of time and resources.

Top management has to be fully behind the effort and shouldn't expect immediate cash savings. Be prepared to discover problems you may wish you didn't know about, then prioritize which ones to fix first.

When's the best time to begin? Given that environmental and workplace safety regulations soon will require chemical safety management procedures to be in place for many companies anyway, it makes sense to start sooner rather than later. As Abe Vizhansky says, "I hate being caught by surprise, so I usually try to keep an eye on new proposed environmental regulations. If something's coming in two years, I want to start planning for it now, not wait until the deadline."

But whether or not you will be covered by the new regulations, chemical safety management is here to stay. It reflects society's new concern for safety and environmental issues, and it can help your business be more efficient and competitive.

WHICH HAZARD ANALYSIS IS BEST?

Some methods of hazard analysis are more involved than others. All, however, are designed to do the same thing: identify and describe all possible hazards, and determine their likelihood and consequences. That knowledge in turn helps plant managers assess risks and identify steps-then take actions needed to prevent accidents from happening in the first place.

Each method has its own advantages and disadvantages, and finding the right one for you depends on everything from the complexity of your operation to what stage it's in. Simpler methods might be applied to the overall operation in a preliminary survey, with more detailed analysis reserved for only the most serious hazards.

In general, simpler operations may only requite· simpler analyses. Books and outside consultants can help you choose which one is right for your facility. The American Institute of Chemical Engineers' Center for Chemical Process Safety (see "Help!") publishes the Guidelines for Hazard Evaluation Procedures, a comprehensive survey of the different techniques and how to implement them.

Among the most commonly used methods are:

WHAT IF ANALYSIS

This method asks a series of questions such as, "What if Pump X stops running?" or "What if an operator opens the wrong valve?" to explore possible hazard scenarios and consequences. This method is often used to examine proposed changes to a facility.

HAZOP STUDY

This is the most popular method of hazard analysis used by the petroleum and chemical industries. The hazard and operability (HAZOP) study brings together a multi-disciplinary team, usually of five to seven people, to brainstorm and identify the consequences of deviations from design intent for various operations. Specific guide words ("No;' "More;' "Less;' ''Reverse;' and so on) are applied to parameters like flow and pressure in a systematic way. It requires the involvement of a number of people, working with an experienced team leader.

FAILURE MODES, EFFECTS, AND CRITICALITY ANALYSIS (FMECA)

This method tabulates each system or unit of equipment, along with its failure modes, the effect of each failure on the system or unit, and how critical each failure is to the integrity of the system. Then the failure modes can be ranked according to criticality to determine which are the most likely to cause a serious accident.

FAULT TREE ANALYSIS

This is a formalized deductive technique that works backward from a defined accident to identify and graphically display the combination of equipment failures and operational errors that led up to the accident. It can be used to estimate the quantitative likelihood of events.

EVENT TREE ANALYSIS

This method is a formalizing deductive technique that works forward from specific events or sequences of events that could lead to an accident. It graphically displays events that could result in hazards and can be used to calculate the likelihood of an accident sequence's occurring. It is the reverse of fault tree analysis.

COMMUNITY OUTREACH: A Good Neighbor Policy

Managers at the Union Camp Corporation facility in Dover, Ohio, know all about the importance of good community relations. Their small organic chemical plant sits right in the middle of a residential neighborhood, surrounded by 100 or so households -- most of whose members know very little about what goes on inside the fence. So when the company installed safety sensors on an ammonia refrigeration system near their property line a few years ago, they decided to let the community know about it.

Nick Dragna, technical manager for the plant, says he's glad they did. But Dragna remembers upper-level managers being nervous at first because "it was the first time anyone had wanted to go out and do that kind of thing in the community." In fact, when Union Camp told the mayor's office, the city council, and the local fire department that they intended to "go public" with their information, the city officials had a similar reaction. ''They were concerned about alarming people unnecessarily, because we'd never had a serious incident." says Dragna.

Ultimately, though, Dragna and his colleagues went ahead with their plan. First they gave the fire department training materials on proper ways to handle ammonia. Then they installed a sensor system on telephone poles located across the street from the ammonia refrigeration system and linked those sensors to an alarm in the fire department.

The next step was to inform the community of what they had done. The company sent out flyers describing the sensor system and explaining what to do in the event of an ammonia release. Finally, the community was invited to a meeting at a local motel to learn more about the subject. Dragna and other plant personnel practiced their talks ahead of time and had them reviewed by a communications expert to make sure the engineers explained themselves clearly without creating undue alarm.

In the end, 35 to 40 people approximately a third of the local homeowners came to the meeting. "The reaction was excellent," says Dragna. During a question-and-answer period, someone in the audience asked whether the company was legally required to inform the public of what they had done. "The answer, of course, was no," says Dragna, "and that gave us an opportunity to say, "We're doing this because we have a concern, and we want to be good neighbors: I think that one question made the entire meeting worth it."

Community outreach, however, is more than just a neighborly gesture. It's also good business, says Lisa Doerr, Director of the Minnesota State Citizens for a Better Environment (CBE). "Companies should look at communities as a long-term investment. If you have a relationship with the people, you will have support when things go wrong, or when the company wants to expand or needs a zoning permit." Doerr advises, "You need to build bridges."

Doerr's citizens' group establishes "good neighbor agreements" with companies to involve community representatives in prevention planning. This pro-active outreach program brings in not only neighborhood activists, but business, school, and community leaders: "These agreements also give companies a chance to make their case to the community, to show their side in terms of plant processes, business goals, and responsibilities for prevention," she explains.

Lowell Johnson, chairman of the Community Action Group in the Minneapolis-St. Paul area, notes that a frequent stumbling block for small businesses is taking the time from their busy schedule to have these kinds of meetings. "But many companies may want to "market" the idea that they've got a safety program," he says. He recommends that businesses take the first step and make that call to the local emergency planners or fire or police department, and say, "I'd like to introduce myself and tell you about my business."! Johnson's definition of outreach is "'breaking down barriers in 'interpersonal relationships." He explains, "If you get to know people as people that makes the rest of the process go much better. We sometimes forget that. We get hung up a lot of times on chemicals and plans and equipment. But it still comes down to just dealing with people."

So share what you know. Being a good neighbor can only be good for your business.

RIGHT-TO-KNOW AND PUBLIC INFORMATION

The Emergency Planning and Community Right-to-Know Act of 1986 (also known as SARA Title III) requires companies to identify specific chemicals and their quantity and location within a plant. Companies must also be prepared to provide that information to the public upon request. Related requirements under the new Clean Air Act will make information available to the public on the way companies manage the risks of the chemicals they handle.

Many businesses, however, will not be covered by these requirements, depending on the chemicals they use and the quantities they have on-site. Beyond the regulatory requirements, a public information program targeted to the community can enhance good community relations.

REFERENCE MATERIALS

CHEMICAL PROCESS SAFETY MANAGEMENT

- Guidelines on Technical Management of Chemical Process Safety. This book describes each of 12 basic elements that must be considered in the development of a technical management system, explains why it is important, and provides information on alternative approaches to each element and its components. These elements are considered 'in the context of plant design, construction, operation, and management – a "holistic" approach. American Institute of Chemical Engineers.
- Managing Risk -- Systematic Loss Prevention for Executives. Publication discusses risk analysis and cost with emphasis on bottom line performance. American Society of Safety Engineers
- Profitable Risk Control: The Winning Edge. How to identify risks to avoid accidents. Topics include performance measurements, hazard identification, loss control, and cost evaluation. One hundred case histories, with causes and effective risk controls. American Society of Safety Engineers
- A Resource Guide for Implementing the Process Safety Code of Management Practices. Provides an interpretation of the CMA process safety code, describes the scope of the code in relation to other Responsible Care™ segments, and provides advice on how to achieve continual safety improvement. Chemical Manufacturers Association
- Process Safety Management (Control of Acute Hazards). A CMA study of techniques of hazard identification, assessment, and control, and their application during process design and operation. Chemical Manufacturers Association
- A Manager's Guide to Reducing Human Errors. Provides a basic understanding of the causes of human errors and suggests ways to reduce them at chemical facilities. This guide also describes how to incorporate human reliability analysis (HRA) into process safety management activities. Chemical Manufacturers Association

- CCPS/AIChE Directory of Chemical Process Safety Services. Comprehensive directory of organizations offering consulting services, emergency services, testing services, or training courses from offices in the US and Canada. More than 350 firms are included in this subject-organized reference. American Institute of Chemical Engineers

CHEMICAL ACCIDENT PREVENTION

- Blueprint for Prevention: A Guide to Preventing Chemical Releases. Guidebook for workers on surveying the workplace, protective equipment assessment, medical planning, and stress and emergency response. Workplace Health Fund.
- Recommendations to Chlor-Alkali Manufacturing Facilities for the Prevention of Chlorine Releases. Guide for manufacturing facilities in implementing CMA's Responsible Care™ process safety code and OSHA's new process safety standard. The Chlorine Institute
- Review of Emergency Systems, Final Report to Congress. Details the approach, findings, and recommendations of EPA's study as required under section 305(b) of SARA Title III. Documents the project's surveys, evaluations, site visits, and expert panels. US Environmental Protection Agency
- Why Accidents Occur: Insights From the Accidental Release Information Program. Bulletin focuses on the causes of accidents based on information collected under EPAs Accidental Release Information Program. Presents insights from the program to help LEPCs communicate with local facilities. US Environmental Protection Agency
- Safe Warehousing of Chemicals. Resource manual outlines broad elements involved in the safe warehousing of chemicals. It addresses environmental protection issues, emergency planning and warehouse buildings, and features a guide to compatibility of chemicals, which shows chemical combinations believed to be dangerously reactive in the case of accidental mixing. Chemical Manufacturers Association
- Fixed Equipment Inspection Guide. Helps companies implement CMA process safety code. It serves as a management tool for defining arid developing an inspection system, including a sample fixed equipment manual that can be modified for individual company and site requirements. Chemical Manufacturers Association
- Guidelines for Safe Storage & Handling of High Toxic Hazard Materials. Details the elements needed for a reliable system that can help prevent the equipment and human failures that might lead to catastrophic accidental release of high toxic hazard chemicals. American Institute of Chemical Engineers

RELEVANT STATUTES

- Emergency Planning and Community Right-to-Know Act of 1986 (SARA Title III), 42 U.S.C. 1101 et seq. SARA Title II is codified in Title 42 of the United States Code, which is available in public libraries and law offices. SARA Title III regulations are codified in Title 40 of the code of Federal Regulations, available in public libraries. Emergency planning and notification rules are at 40 CFR Part 355. Reporting under SARA sections 311 and 312 is covered at 40 CFR Part 370. The annual toxic release inventory reporting under SARA section 313 is covered at 40 CFR Part 372.
- The OSHA Hazard Communications Standard is codified at 29 CFR 1910.1200.
- The Clean Air Act is codified at 42 U.S.C. 7401 et seq. The chemical accident prevention provisions are in 42 U.S.C. 7412(r). The Clean Air Act Amendments are found in Public Law 101-549, November 15, 1990. The chemical accident prevention provisions are found in sections 301(r) and 304 of Public Law 101-549.
- Occupational Health and Safety Act, 29 U.S.C. 651 et seq.
- Hazardous Materials Transportation Uniform Safety Act of 1990, Public Law 101-615.
- Oil Pollution Act of 1990, Public Law 101-380.

TRAINING

- Accident Control Techniques, workbook (4 hours training). Information on general preventive maintenance measures, safety information, fire prevention, safety devices, safe work practices, and injuries and illness. American Petroleum Institute,
- The OSHA Hazard Communication Standard: An Employer's Handbook. This 112-page guide explains in straightforward terms what businesses' obligations are under the OSHA Hazard Communications Standard. It is intended primarily for small- to medium-size companies. US Chamber of Commerce
- Chemical Process Operator Certification Training. This worker certification program is designed to enable companies to train and certify their chemical process operators. Though intended for companies of all sizes, it is specifically designed for the needs of small locations. There are manuals for both workers and instructors as well as seminars for the instructors. Synthetic Organic Chemical Manufacturers Association
- Chemical Process Operator Certification Training. Manuals and seminars. Includes Level I: Basic Operator Training and Level II: Process Specific Training, e.g., reactor systems, process safety, environmental controls and instrumentation. For information contact Synthetic Organic Chemical Manufacturers Association
- Safety in the Aerosol Laboratory (AN Program). Produced with the aerosol industry, this audiovisual program focuses on the safe use and handling of hydrocarbon

aerosol propellants in the laboratory. Ideal for in-plant viewing by all levels of personnel. The program pinpoints ways to avoid fires and explosions, thereby preventing injury, lost research and development time, property damage, and medical expenses. The program goes with the updated Hydrocarbon Propellants Manual and ''The Gassing Room" audiovisual program. Chemical Specialties Manufacturers Association

- Hydrocarbon, Dimethyl Ether, and Other Propellants: Considerations for Effective Handling in the Aerosol Plant and Laboratory. Text includes instructions on the proper use, shipping, storage, and disposal of dimethyl ether (DME) and difluoroethane (DFE, 152a) and disposal of filled aerosol cans. Also discusses shipping and storage of propellants, gassing room disposal, laboratory guidelines, and proper training. Chemical Specialties Manufacturers Association

HAZARD EVALUATION

- Guidelines for Hazard Evaluation Procedures. This book lists qualitative procedures for hazard identification, helping readers learn to apply the proper hazard evaluation method to each process. American Institute of Chemical Engineers
- Major Industrial Hazards: Their Appraisal and Control. Document presents methods of risk estimation and measurement of potential hazards against likely benefits. American Society of Safety Engineers
- Guidelines for Chemical Process Quantitative Risk Analysis. CPQRA identifies areas where operations, equipment, or management systems may be modified to reduce risk of catastrophic incidents. Text explains how this technique can also help identify cost effective process and operational improvements. American Institute of Chemical Engineers
- Guidelines for Process Equipment Reliability Data, with Data Tables. Supplements CPQRA guidelines with failure rate data to perform a CPQRA. Contains easily accessible data in the CCPS Generic Failure Rate Data Base, information on several generic data resources, and procedures to develop failure rate data using information from the plan and process studied. American Institute of Chemical Engineers

EMERGENCY PLANNING

- Hazardous Materials Emergency Planning Guide. Gives local authorities an overview of what's involved in selecting and organizing an emergency planning team, defining the team's tasks, and developing, testing, and maintaining the plan. National Response Team, US Environmental Protection Agency
- How to Prepare for Workplace Emergencies. Booklet provides guidelines for planning for emergencies, including sections on command, communication, and evaluation. Occupational Safety and Health Administration
- Preparing for Emergency Planning. Guide for plant managers describes basic provisions of hazardous substance laws. National Association of Manufacturers
- CAER Code Resource Guide. Three-ring binder outlining the CAER process and the CAER code of management priorities under Responsible Care™. Provides approaches and checklists for developing and implementing local community awareness and emergency response plans and examples of successful CAER programs. Chemical Manufacturers Association
- Site Emergency Response Planning Guidebook. Comprehensive handbook looks at options for facility emergency response planning and is also an appendix to CAER Code Resource Guide. Chemical Manufacturers Association
- CAER: Planning Emergency Exercises Videotape. Explains in simple way how to plan and conduct four types of community emergency exercises (10 minutes). Available in VHS and ¾". Chemical Manufacturers Association
- National Chemical Response and Information Center (NCRIC) Brochure. Provides information on CHEMTREC, CHEMNET, emergency response training, and the Chemical Referral Center. Chemical Manufacturers Association
- ICHIEFS. ICHIEFS information center is an electronic link to the latest training and education news, legislative activities, publications, workshops, conferences, hazardous materials news, and computer software applications for fire chiefs and related emergency service professionals. ICHIEFS gives direct access to state and national agencies and is compatible with either Macintosh or PC systems. International Association of Fire Chiefs
- Fire Service Emergency Management Handbook. Insights to strengthen a community's ability to respond to a wide range of emergency situations. Ranging from earthquakes to hazardous chemical spills, text covers disaster management concepts and systems and checklists for specific hazards. International Association of Fire Chiefs

SARA TITLE III

- Chemicals in Your Community, A Citizen's Guide to the Emergency Planning and Community Right-to-Know Act. General overview of Title III requirements and benefits for all audiences. US Environmental Protection Agency
- It's Not Over in October: A Guide for Local Emergency Planning Committees. Suggestions for LEPCs to help them implement SARA Title III. Describes the function of LEPCs and provides ideas and examples based on past LEPC, EPA, and Federal Emergency Management Agency experiences. US Environmental Protection Agency

- Manager's Guide to Title III. Provides the chemical facility manager with a summary of federal requirements under Title III and some practical approaches to complying with them. Chemical Manufacturers Association
- Resource/Users Guide to Title III Materials. The complete list of CMA publications and videos available on Title III as well as a guide to using materials with various audiences. Chemical Manufacturers Association
- Title III Community Awareness Workbook. To help plant managers communicate with the various segments of their communities, this workbook covers communications approaches for the specific sections of Title III, risk communications, community relations, working with the media, a timeline for communications activities, and an appendix of examples of communications activities. Chemical Manufacturers Association

GENERAL INFORMATION

- Small Business and Clean Air. Pamphlet explains the new small business obligations set by the 1990 amendments to the Clean Air Act. US Chamber of Commerce
- Cleaning Up Toxics in Business. This 25-minute videotape, by the League of Women Voters of California Education Fund, suggests what small businesses – drycleaners and auto repair shops, for example -- can do to prevent pollution and control toxic chemicals. Emphasizes both environmentally safe and cost-effective practices.
- Occupational Health and Safety in American Industry. This booklet teaches employers (both large and small businesses) some possible ways to organize in order to assure a safe and healthy workplace as well as ways to respond to unforeseen hazards. It also presents new information concerning workers' health. US Chamber of Commerce.

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HOME

EPA'S ROLE IN COUNTER-TERRORISM ACTIVITIES

The U.S. Environmental Protection Agency (EPA) is preparing for and will respond to terrorist threats from weapons of mass destruction. Weapons of mass destruction are "weapons or devices that are intended, or have the capability, to cause death or serious bodily injury to a significant number of people, through the release, dissemination, or impact of toxic poisonous chemicals; disease organisms; or radiation or radioactivity."

Because of its inherent role in protecting human health and the environment from possible harmful effects of certain chemical, biological, and nuclear materials, EPA is actively involved in counter-terrorism planning and response efforts.

"We cannot afford to wait for an incident involving weapons of mass destruction. We cannot afford to be unprepared at any level." -- Former U.S. Senator Sam Nunn

Incidents involving weapons of mass destruction have resulted in many deaths, numerous serious injuries and massive destruction of property. Examples of such incidents, both at home and abroad, include:

- A bomb exploded in a garage of the World Trade Center in New York City in February 1993; six people were killed, 1,000 injured, and millions of dollars in damages were sustained.
- The highly toxic chemical gas Sarin© was intentionally released in the Tokyo, Japan, subway in March 1995; 12 people were killed and thousands were injured, many seriously.
- A bomb exploded in front of a Federal building in Oklahoma City in April 1995; 165 people were killed, many hundreds were injured, and millions of dollars in property losses to the Federal government and local businesses were sustained.

The U.S. government has responded to the threat from terrorist activities by helping State and local governments prepare for and respond to terrorist threats that involve weapons of mass destruction. This planning effort is being conducted through a partnership that involves EPA, the Department of Defense, the Department of Energy, the Federal Bureau of Investigation, the Federal Emergency Management Agency, and the Public Health Service.

Why Is EPA Involved?

Under the Emergency Planning and Community Right-to-Know Act (EPCRA), the Clean Water Act as amended by the Oil Pollution Act of 1990 (OPA), the Safe Drinking Water Act, and the "Superfund" law, Congress gave EPA responsibilities and legal authorities to prepare for and respond to emergencies involving oil, hazardous substances, and certain radiological materials -- any of which could be a component of a weapon of mass destruction.

In addition, the President has given EPA responsibility for some counter-terrorism activities. EPA's responsibilities include:

- Assisting the FBI in determining what sort of hazardous substance may be, or has been, released in a terrorist incident.
- Following an incident, assisting with environmental monitoring, decontamination efforts, and long-term site cleanup operations.

EPA's Role

EPA supports the Federal counter-terrorism program specifically by:

1. **HELPING STATE AND LOCAL RESPONDERS TO PLAN FOR EMERGENCIES.** Since 1986, EPCRA has required every community to develop an emergency plan that prepares for accidental releases of extremely hazardous substances, and should one occur, makes provisions for rapid responses to protect the community. These existing plans should be updated to incorporate planning and response to deliberate chemical releases that are the hallmark of terrorist incidents. By 2003, 50 percent of all Local Emergency Planning Committees (LEPCs) shall have incorporated planning and response to deliberate releases by terrorists into their emergency plans.
2. **TRAINING FIRST RESPONDERS**. In addition to EPA's existing training program for first responders, EPA is one of six Federal agencies participating in a program to train personnel who are likely to be first on the scene of a terrorist incident. Local first responders will be trained to respond effectively and safely to potential terrorist attacks in which chemical or biological agents have been used against a civilian population. EPA assisted in the development of the first responder training program, which will be given to 120 of the largest cities in the U.S. by 2002.

3. **PROVIDING RESOURCES IN THE EVENT OF A TERRORIST INCIDENT.** EPA has specialized facilities and uniquely qualified personnel to help local and State personnel prepare for and respond to emergencies, such as those that might result from a terrorist incident. We assist our Federal partners and State and local governments through a variety of resources, including On-Scene Coordinators (OSCs); the Environmental Response Team; other emergency response personnel; the National Enforcement Investigations Center; and various radiological response capabilities.

Need More Information?

Call the Emergency Planning and Community Right-to-Know Hotline at 1-800-424-9346.

During an emergency, the National Response System can be accessed 24 hours a day by calling the National Response Center (NRC) at 1-800-424-8802.

The NRC will then call the Regional emergency spill response line and access the on-duty Federal OSC.

ARE YOU READY – THE NATIONAL RESPONSE SYSTEM

More than 30,000 Environmental Emergencies Occur Each Year

Each year, our environment and communities are threatened by more than 30,000 hazardous chemical releases, oil discharges, and other toxic spills. The National Response System (NRS) ensures that these threats are effectively managed through its network of people, plans, and resources. The NRS is comprised of federal, state, and local governments that work together to protect Americans from threats to our land, air, and water.

The NRS is described in the National Oil and Hazardous Substances Pollution Contingency Plan, or NCP, found in 40 C.F.R. Part 300. The NRS is comprised of federal, state, and local governments that work together to protect Americans from threats to our land, air, and water. The FOSC coordinates or directs on-scene response resources and efforts during a pollution incident.

Key Components of the National Response System

Leadership

Federal On-Scene Coordinators (FOSCs)

The FOSC is a key player during an oil or hazardous chemical emergency. The FOSC coordinates or directs on-scene response resources and efforts during a pollution incident. Actions may include sampling and monitoring, controlling the source of the release, on-site treatment, and off-site waste disposal. The FOSC also oversees area planning, provides access to the expertise of the NRS federal member agencies, and is a valuable source of support and information to the local response community. The FOSC is pre-designated by the U.S. Environmental Protection Agency (EPA) for inland areas and by the U.S. Coast Guard (USCG) for coastal areas. There are more than 250 EPA and USCG FOSCs located throughout the U.S. The Department of Defense and the Department of Energy provide FOSCs for hazardous substance pollution incidents at their facilities or under their jurisdiction.

Regional Response Teams (RRTs)

The RRTs ensure that the multi-agency resources and expertise of the NRS are available to support the FOSC as needed during a pollution incident. There are 13 RRTs, one for each of the ten EPA federal regions, plus one for Alaska, one for the Caribbean, and one for Oceania. The RRTs are comprised of representatives from the 15 federal NRS member agencies, plus Regional Response Teams state representatives, and are co-chaired by the EPA and USCG. Each RRT develops a Regional Contingency Plan that describes the policies and procedures for a quick and effective response to pollution incidents. More detailed plans are developed at the sub-regional level by Area Committees and at the local level by Local Emergency Planning Committees (LEPCs). The State Emergency Response Commission (SERC) supervises and appoints members to the LEPCs. Together, SERCs, LEPCs, and Area Committees ensure effective preparedness among all levels of government and between private sector and public response efforts.

The National Response Team (NRT)

The NRT is comprised of the 15 federal member agencies of the NRS, each with responsibilities and expertise in various aspects of emergency response to pollution incidents. With nationwide responsibilities for interagency planning, policy, and coordination, the NRT ensures that the most valuable tool in an emergency — readiness — is available for pollution incidents of all sizes and kinds. Prior to an incident, the NRT provides policy guidance and assistance. During an incident, the NRT may be activated if needed to provide national-level advice and assistance, as well as access to member agency resources that could not be provided at the RRT level. The EPA serves as chair of the NRT, and the USCG serves as vice chair. In addition to interagency coordination, the NRT also engages the private sector in prevention, preparedness, and response efforts. The NRT encourages innovation and collaboration to increase the effectiveness and reduce the cost of industry compliance with planning and response regulations. The NRT does not receive direct appropriations for its activities.

The National Response Center (NRC)

The NRC is the communications core of the NRS. It is staffed 24 hours a day and receives more than 30,000 incident notifications each year. From these notifications, NRC watchstanders generate reports and relay them to the appropriate FOSCs and to the SERCs. Federal law requires the responsible party to report oil spills, gas and hazardous liquid pipeline releases, chemical releases, and radiological releases to the NRC.

Partnerships

One of the important features of the NRS is that no presidential declaration of a disaster is necessary to obtain federal support. A single phone call to the FOSC through the NRC allows immediate activation of the NRS.

International Involvement

The NRT plays an advisory role during international incidents in responding to government-to-government requests for international preparedness and response assistance.

The EPA and USCG, in consultation with the Department of State, have established joint inland and coastal contingency plans, respectively, with both Mexico and Canada to facilitate coordinated and integrated federal and international response to significant polluting incidents along shared boundaries.

These joint plans also provide a mechanism for cooperative responses among all levels of government. At the request of the Co-chairs of the Canada-U.S. International Joint Advisory Team (IJAT) and the Mexico-U.S. Joint Response Team (JRT), the NRT serves in a consultative capacity if any of these joint contingency plans are activated.

The IJAT and JRT are policy and advisory bodies with overall responsibility for the maintenance, coordination and implementation of these joint contingency plans. Moreover, the NRT, in an advisory capacity, coordinates long-term preparedness, training, and response assistance to the Panama Canal Authority.

National Response Framework

The National Response Framework (NRF) provides the overarching framework for coordinating federal, state, local, and private sector response efforts to domestic incidents.

Under the NRF, the Department of Homeland Security (DHS) coordinates federal response efforts for incidents requiring significant federal interaction, such as emergencies and disasters declared by the President under the Robert T. Stafford Act, and terrorist incidents.

When the incident involves an actual or potential release of hazardous materials, DHS may activate an annex to the NRF called Emergency Support Function (ESF) #10 – Oil and Hazardous Materials Annex.

The activation of ESF #10 brings the resources of the NRS to support the federal response. The FOSCs, RRTs, and NRT would function under ESF #10 as described elsewhere in this brochure.

ESF #10 addresses environmental hazards from natural disasters such as hurricanes, floods, and tornadoes.

In addition, the NRS can provide critical assets to mitigate dangers to public health and the environment from terrorist incidents involving chemical, biological, and radiological materials, including weapons of mass destruction. The FOSCs, RRTs, and NRT actively participate in counterterrorism preparedness activities to help foster a coordinated federal, state, and local response.

Solutions

Logistical Support, Technical Assistance, Scientific Expertise, and Coordinating Capability

Together, the 15 member agencies of the NRS provide solutions for effective response to a wide range of pollution incidents, both foreign and domestic.

In addition, each agency can provide access to technical assistance, scientific expertise, logistical support, or coordination capabilities associated with its specific responsibilities and expertise. The NRT and RRTs coordinate planning and can access assets and capabilities of its member agencies to support FOSCs and state and local responders. The following are only a few examples of each NRS agency's capabilities.

Department of Agriculture (USDA) USDA's Forest Service, Agricultural Research Service, and other agencies have personnel, laboratory, and field capabilities to evaluate, monitor, and control situations where natural resources, including soil, water, wildlife, and vegetation, have been impacted by hazardous substances and other natural or manmade emergencies. Further, the Forest Service offers additional equipment to the response effort.

Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) NOAA, through the Scientific Support Coordinators, provides scientific information and expertise to mitigate the impacts of oil and hazardous substance releases on natural resources in coastal and navigable water areas. NOAA's expertise includes environmental chemistry, contaminant transport in air and water, weather forecasts, oceanographic conditions, marine fisheries, marine mammals, hydrographic surveys, geodetic positioning, satellite imagery, and high resolution digital aerial photography.

Department of the Interior (DOI) Through its bureaus and offices, and based on its extensive land and resource management responsibilities, DOI provides scientific expertise to FOSCs to help protect sensitive natural, recreational, and cultural resources and areas. DOI also provides experts on remote sensing; mapping (including GIS); surface and ground water contamination; contaminant transport; oil, gas, and mineral development; and oil spill response, and is available to facilitate environmental recovery.

Department of Justice (DOJ) DOJ, in coordination with legal counsel of the federal agencies and departments involved, provides expert advice on legal questions arising during an incident. DOJ also represents the federal government in litigation relating to hazardous substance, oil, chemical, or biological releases. Through the Federal Bureau of Investigation (FBI), DOJ is the lead federal agency for the coordination of law enforcement and investigative activities in response to threats or acts of terrorism.

Department of Health and Human Services (HHS) HHS's Centers for Disease Control and Prevention (CDC) and

National Institute of Environmental Health Sciences (NIEHS) provide worker health and safety training, while the Agency for Toxic Substances and Disease Registry (ATSDR) has established a surveillance system to evaluate the human health exposures to hazardous substances in emergencies. During an incident, CDC and ATSDR also advise the FOSC on human health threats and the prevention or mitigation of exposure to hazardous substances.

Department of Defense (DOD) For response to contaminant release incidents, DOD’s Supervisor of Salvage & Diving, the Army Corps of Engineers, and the Chemical Biological Radiological Nuclear & High-Yield Explosives Consequence Management Response Force (CCMRF) have extensive expertise in containment, collection, and mitigation. This is in addition to DOD's National Guard capabilities, which can include a WMD Civil Support Team (CST) and a CBRNE Enhanced Response Force Package (CERFP).

Department of Energy (DOE) DOE’s National Nuclear Security Administration is ready to respond to any type of nuclear/ radiological accident or incident domestically or internationally, including monitoring, assessment, and working with local, state, and federal agencies and officials to resolve the situation.

Department of Labor (DOL) DOL’s Occupational Safety and Health Administration (OSHA) has the responsibility and authority to ensure that response workers are protected and to determine if response sites are in compliance with safety and health standards. In this role, OSHA provides consultation and enforcement, as appropriate, and requires adequate training, controls, and personal protective equipment to ensure that responders are properly protected during a response.

Department of State (DOS) DOS coordinates international response and notification efforts when discharges or releases may affect international interests, including when they involve foreign flag vessels or threaten impact beyond U.S. jurisdiction. DOS also coordinates requests for NRS assistance from foreign governments.

Department of Transportation (DOT) DOT’s Pipeline and Hazardous Materials Safety Administration (PHMSA) manages national transportation safety programs for hazardous materials and oil by all modes of transportation and pipelines. In addition, the PHMSA provides technical assistance to the planning and response communities, including publication of the DOT Emergency Response Guidebook.

Environmental Protection Agency (EPA) EPA provides FOSCs and coordinates preparedness and response for hazardous substance releases and oil discharges in the inland zone. EPA has a number of special teams that can assist FOSCs, including the Environmental Response Team, National Decontamination Team, and Radiological Emergency Response Team. These Teams have highly trained scientists, engineers, and other technical experts who provide training and specialized assistance in multimedia sampling and analysis, hazards assessment, cleanup techniques, and waste management.

General Services Administration (GSA) GSA provides logistical and telecommunications support during an incident. This support may include providing space, telephones, transportation, supplies, equipment, and procurement-related services.

U.S. Nuclear Regulatory Commission (USNRC) USNRC regulates civilian nuclear facilities and nuclear materials. USNRC is the lead federal agency during radiological events involving licensees and provides expertise during other radiological incidents.

Federal Emergency Management Agency (FEMA) FEMA, which is part of DHS, is the lead agency for administering financial and technical assistance during a Presidentially declared disaster or emergency under the Robert T. Stafford Act. FEMA is responsible for providing hazardous materials response guidance and training for emergency first responders.

U.S. Coast Guard (USCG) USCG reports directly to the Secretary of DHS. USCG provides FOSCs and coordinates government and industry activities for oil spills and hazardous substance releases in the coastal zone. USCG Strike Teams are specially trained and equipped to respond to oil spills and chemical releases. USCG also develops and delivers exercise and training programs for the NRS.

For more information on the NRS, as well as preparedness and response tools, visit our web site at www.nrt.org.

HOME

EPA 500-F-10-001, June, 2010

EPCRA: GUIDANCE ON REPORTING OPTIONS FOR SECTIONS 311 AND 312, AND SOME INTERPRETATIONS

EPA provided draft guidance in the preamble to the June 8, 1998 proposed rule (63 FR 31268) to streamline the reporting requirements for facilities under sections 311 and 312 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). The Agency did not propose any regulatory changes, but sought comments on the following reporting options.

1. Underground Storage Tank (UST) Forms to fulfill the requirements for Tier I information under EPCRA section 312;
2. Partnership Programs for joint access to information and streamlined submission of EPCRA sections 311 and 312 reporting. If a single point submission is allowed for facilities, then one agency would receive the information and provide access to the other agencies;
3. Electronic submittal and certification for EPCRA section 312 reporting;
4. Incorporation of previous submissions into EPCRA section 312 reporting;
5. Electronic access to facility Material Safety Data Sheet (MSDS) database; and
6. EPCRA section 312 reporting to fulfill reporting requirements under section 311.

EPA is now providing guidance on these reporting options. The objective for this guidance is also to provide state and local agencies with flexibility in implementing sections 311 and 312 of EPCRA.

Who is Affected by this Guidance and Interpretation?

Entities that will be affected include those organizations and facilities subject to sections 302, 304, 311 and 312 of EPCRA and the implementing regulations found in 40 CFR parts 355 and 370.

EPA's Decision on These Proposed Options

UST Forms

- Since all states now require facilities to submit a Tier II inventory form or the state equivalent form, this reporting option is no longer useful.

Partnership Programs for Joint Access to Information and Submission of EPCRA 311 and 312 Reporting

- States may implement the Partnership Programs for Joint Access reporting option; however, they must ensure that statutory and regulatory requirements are met. If states choose to implement this option, a formal agreement is necessary between the State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), and fire department. States should then notify the facilities about this agreement and the new submission process.
- States must also meet the March 1 reporting deadline, as specified in the statute.

Electronic Submittal and Certification for EPCRA Section 312 Reporting

- States may require facilities to submit information using Tier2 Submit, the federal electronic reporting format, or the state equivalent electronic reporting format. If facilities do not have the capability to file information electronically, states should allow these facilities to submit paper copies of the Tier II report.
- The original signature requirement in 40 CFR 370.41 and 370.42 could be met by providing the certification statement on paper or by any electronic certification established by the state and local agencies.

Incorporation of Previous Submissions into EPCRA Section 312 Reporting

- Facilities are required to submit a Tier I form or, if requested, a Tier II form annually to the SERC, LEPC, and the fire department, even if the information from the previous year has not changed. Most states have established electronic reporting or are using Tier2 Submit software developed by EPA. Therefore, the burden for facilities to re-create information on paper does not exist for most facilities.
- States may adopt this reporting option for those facilities that submit section 312 information on paper.

Electronic Access to Facility MSDS Database

- Section 311 of EPCRA requires facilities to submit MSDSs for hazardous chemicals that meet or exceed the reporting thresholds to the SERC, LEPC, and the fire department. The Agency suggested electronic submission of MSDSs or providing access to facilities' MSDS database to reduce the burden on the regulated community and reduce the information management burden on implementing agencies.
- Due to security concerns and several entities lacking access to computers or on-line systems, EPA has rejected this reporting option.

EPCRA Section 312 Reporting to Fulfill Reporting Requirements under Section 311

- This reporting option is only beneficial to those facilities that acquire a new chemical between October 1 and December 31 of any given calendar year.
- States may implement this reporting approach ensuring that facilities comply with section 312 three months after acquiring a new chemical.

What are the Interpretations of Emergency Release Notification and Hazardous Chemical Exemption for solids?

The Agency is also providing new interpretations and revising existing interpretations to help facilities comply with certain requirements under EPCRA.

Emergency Release Notification

- Under EPCRA section 304, facilities may have up to 30 days to submit a written follow-up report to state and local agencies. States may implement more rigorous requirements.

Hazardous Chemical Exemption for Solids under EPCRA Section 311(e)(2)

- Facilities would only have to count the amount of fume or dust given off a piece of metal, brick, or any other manufactured solid item that undergoes a modification process. States may implement more rigorous requirements.

Where Do I Go For More Information?

For more information on this guidance, please visit the Office of Emergency Management Web site: http://www.epa.gov/emergencies/.

OSWER 88.005, September, 1988

COMMUNITY RIGHT-TO-KNOW AND SMALL BUSINESS: Understanding Sections 311 and 312 of EPCRA of 1986

HOME

This brochure has been developed to provide small businesses with important information on whether to report, and how and what to report under Sections 311 and 312 of the Emergency Planning and Community Right-To-Know Act of 1986. The document is not intended to replace any regulations written in support of the law. It is intended to assist the small business owner with compliance. Also, the brochure does not detail all of the sections of the Emergency Planning and Community Right-To-Know Act of 1986. You may face other requirements under this law.

Historical Background

In December 1984, a cloud of highly toxic methyl isocyanate spewed from a chemical plant in Bhopal, India, blanketing the surrounding area in poison. The result-over 2,000 people dead and thousands more injured. Damaged lungs, reduced oxygen flow, severe headaches and temporary blindness accompanied these deaths. Even today, poor health continues to afflict that community. The gravity of this tragedy opened the eyes of the world to the dangers of chemical accidents. Eight months later, a less toxic derivative of that chemical escaped from a West Virginia plant, bringing these same concerns home to the United States.

Accidents can happen-at any facility in the appropriate circumstances. In Bhopal, prevention equipment had been installed and a local evacuation plan developed. Unfortunately, the equipment was not in service, and the neighboring community was not aware of the plans. The lack of knowledge proved fatal.

Chemicals serve our world well. Paints, plastics, medical supplies, cleaning fluids and countless other necessities play integral roles in our lives. The manufacturing processes for these goods and the goods themselves often involve hazardous chemicals, but knowledge of the hazards and proper use of the substances help ensure safe factories and businesses. Until recently, that seemed sufficient. However, as Bhopal demonstrated, the general public also needs such knowledge in preparation for chemical accidents.

Title Ill and Its Purpose

The United States Congress understood this need and responded with the Emergency Planning and Community Right-To-Know Act of 1986. This law, also known as Title Ill of the Superfund Amendments and Reauthorization Act (SARA), involves four complementary activities:

1. Emergency planning (Sections 301-303) Local Emergency Planning Committees must organize collected chemical information and develop emergency response plans for their community. Facilities where extremely hazardous substances are present above specified threshold planning quantities must be among those who participate in this planning process.
2. Emergency notification (Section 304) Facilities must report accidental releases of certain hazardous substances above specified reportable quantities to State Emergency Response Commissic1ns and Local Emergency Planning Committees.
3. Community right-to-know reporting (Sections 311-312) Facilities required to prepare or have available a Material Safety Data Sheet for hazardous chemicals must submit detailed information to the State Emergency Response Commission, a Local Emergency Planning Committee, and the local fire department.
4. Toxic chemical release reporting (Section 313) Manufacturing facilities that release certain toxic chemicals must report the total amount of emissions to the Environmental Protection Agency in Washington, D.C and to State officials.

Together, Title Ill creates a working partnership, consisting of industry and small business, state and local government officials, public health and emergency response representatives, and other interested citizens. Through this interaction and information sharing, a safer community can result. Indeed, all parties share the responsibility for Title Ill, and everyone will benefit.

Community Right-To-Know

Sections 311 and 312 of Title Ill-popularly named community right- to-know-are the focus of this brochure. These provisions, which affect facilities where hazardous chemicals are present, require submission of data on the amount, type and location of those substances. The collected data serve as an essential informational tool for local planners and response personnel, providing the basis for the emergency planning process of Title Ill.

Perhaps most important, fire departments and health officials can tap this wealth of knowledge. At present, firefighters face great risks in battling chemical blazes at factories, small businesses, hospitals, schools. Many chemicals demand special precautions and techniques. If used correctly, Title Ill information can provide emergency workers with vital data, enabling them to respond safely to chemical accidents. Likewise, medical personnel require ready access to such storage data. Unusual symptoms caused by chemical spills demand immediate attention. Title Ill will help.

Sections 311 and 312 also create a new entitlement. The public in every state now has the "right-to-know" about hazardous chemicals present at facilities located in the community. Now, any citizen can request such detailed information. Never before have data on chemical use been so accessible to the public. And never before have so many businesses been potentially affected by a reporting regulation. All companies, large or small, manufacturing or nonmanufacturing, may be subject to this inventory reporting.

Since the law includes a sector unaccustomed to such reporting requirements -- the small business community -- special help is being offered in this brochure.

These opening pages provide a brief overview of Title Ill. The bulk of the brochure details in step-by-step fashion the community right-to-know requirements and allows you, the small business owner, to determine whether you must report, and if so, what. The final pages provide other help, such as an index of the terms and acronyms used in the brochure, and a reference guide of useful contacts, phone numbers and addresses.

Every effort has been taken to clarify the community right-to-know reporting requirements of Title Ill. The goal is to assist you in complying with the law -- an action serving everyone's interests.

Though the reporting responsibilities will require extra effort on your part, you will gain through emergency response plans for your facility, improved relations with your community, and perhaps, better management and chemical handling practices.

And compliance with Title Ill will save you from fines of up to $25,000 per day.

NOTICE

Under Title Ill, states have the authority to go beyond the reporting requirements written in the law. Title Ill is the base for right-to-know reporting-it is the minimum. Since your state law may be stricter than Title Ill, please check with your State Emergency Response Commission to make sure that your submissions meet all necessary requirements.

Reporting Requirements

Background - Hazard Communication Standard

The community right-to-know reporting requirements build on the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (HCS).

The hazardous chemicals defined by the HCS are the hazardous chemicals of Sections 311 and 312. Initially, the HCS applied only to manufacturers (designated by the Standard Industrial Classification (SIC) codes 20 - 39).

However, in 1987, OSHA amended the regulation to incorporate all businesses, regardless of classification or size. As a result, your small business may now be subject to community right-to-know reporting.

Under the Hazard Communication Standard, chemical manufacturers and importers must research the chemicals they produce and import.

If a substance presents any of the physical and health hazards specified in the HCS, then the manufacturer or importer must communicate the hazards and cautions to their employees as well as to "downstream" employers who purchase the hazardous chemical.

The goal behind the HCS is a safer workplace-workers, informed of the hazards they encounter on the job, can create that environment.

One of the required tools of hazard communication is the Material Safety Data Sheet (MSDS). These documents provide many valuable details on the hazardous chemicals regulated by OSHA. Quite likely, you are already familiar with these useful documents. If not, you must become so. The MSDS contains health and safety information for you, and due to the relationship of Title Ill and the Hazard Communication Standard, having an MSDS indicates that you have a hazardous chemical which may require reporting under Sections 311 and 312.

Though the Hazard Communication Standard contains no formal list of chemicals, any of roughly 500,000 products may trigger the requirement. The responsibility for issuing current MSDSs rests with chemical manufacturers, distributors and importers, but the chemical user must ensure proper and complete maintenance of MSDS files. This will help you comply fully with Title Ill.

Congress chose to link Title Ill's community right-to-know rules to the Hazard Communication Standard because both share a common goal of safety – Title Ill for the community and the HCS for the workplace. Understanding that connection is helpful. Although the community right-to-know rules are associated with the HCS, the Title Ill provisions are not redundant requirements. Instead, Title Ill extends the information sharing of workplace right-to-know to the entire community, especially to emergency response personnel.

Do I Have To Report?

To answer the question “Do I have to report?" you should examine four criteria-type of facility, presence of hazardous chemicals, amount present, and any applicable exemptions. As you consider each of these, the chart below will help you determine your reporting status. Simply proceed through the brochure, referring to the chart as necessary.

<table>
<tr><td colspan="4" align="center">1. Type of Facility</td></tr>
<tr><td colspan="2" align="center">Manufacturer
(Standard Industrial Classification codes 20 - 39)
Follow first set of dates.</td><td colspan="2" align="center">Non-manufacturer
(Regulated under the expansion of the Hazard Communication Standard i.e. outside SIC CODES 20 - 39) Follow second set of dates.</td></tr>
<tr><td colspan="2" align="center">CRITERIA</td><td colspan="2" align="center">RESULT</td></tr>
<tr><td colspan="2"></td><td align="center">MUST REPORT
(all "Yes")</td><td align="center">DO NOT REPORT
(any "No")</td></tr>
<tr><td>2.</td><td>Do you have a hazardous chemical (includes extremely hazardous substances) present at your facility requiring a Material Safety Data Sheet under the Hazard Communication Standard?</td><td align="center">YES</td><td align="center">NO
STOP</td></tr>
<tr><td>3.</td><td>Do you have a hazardous chemical (includes extremely hazardous substances) at your facility not exempt under the five exemptions of Title Ill?</td><td align="center">YES</td><td align="center">NO
STOP</td></tr>
<tr><td>4.</td><td>Do you have an extremely hazardous substance or other hazardous chemical at your facility with its - maximum amount greater than the relevant threshold? EHS - 500 pounds or the chemical-specific threshold planning quantity, OR Hazardous (Non-EHS) - 10,000 pounds</td><td align="center">YES

ALL YES
REPORT</td><td align="center">NO
STOP</td></tr>
<tr><td colspan="4">If you answer "NO" to any of the three questions (2-4), then you are not required to report automatically under Sections 311 and 312 of Title Ill. If you answer "YES" to all of these three questions, then you must submit the reports to your State Emergency Response Commission, Local Emergency Planning Committee and local fire department.</td></tr>
</table>

1. Facility

As noted earlier, due to the expansion of the Hazard Communication Standard, all businesses may be subject to community right-to-know reporting. However, the Sections 311 and 312 reporting deadlines for manufacturers (designated by SIC codes 20-39) differ from the deadlines facing the non-manufacturing community. The non-manufacturers' deadlines lag behind those for the manufacturers by almost one year.

Beyond these differences in dates, though, all facilities are treated alike. Any business with one or more hazardous chemicals have to report under community right-to-know.

2. Substances

The Material Safety Data Sheet (MSDS) serves as the indicator of hazardous chemicals at your facility. If you are not required to prepare or keep any MSDSs, then you have no hazardous chemicals, as defined by the Hazard Communication Standard, at your facility. You do not need to report. The "No" in the "Do Not Report" column indicates that you have fulfilled the mandatory reporting requirements for Sections 311 and 312. On the other hand, if you must prepare or maintain MSDSs, mark down a "Yes" to the question and continue reading. You may be required to report.

3. Exemptions

There are five exemptions from reporting requirements for community right-to-know. Some apply to specific chemicals and some to specific chemical uses.

a) Any food, food additive, color additive, drug, or cosmetic regulated by the Food and Drug Administration (FDA) is exempt from reporting. With regard to food additives, a chemical is a food additive only when in use as a food additive, and not when it is stored or used for other purposes, or is being sold to another business for use as a food additive.
b) Any hazardous chemical present as a solid in a manufactured item to the extent exposure to that chemical does not occur under normal conditions of use is exempt. For example, steel would be exempt in its solid form until you weld it, cut it, grind it or do anything else that could cause exposure to hazards such as lead, dusts or hazardous fumes.
c) Any substance used for personal, family or household purposes, or if present in the same form and concentration as a product packaged for distribution to and use by the general public. Packaging, not use, triggers the exemption. Regardless of actual use and intended distribution, if the substance is packaged in a similar way and in the same concentration as it is when used by the general public, then that substance is exempt. For example, a cleaner used by your business and packaged for home use remains exempt no matter how you use it. However, the same cleaner, packaged in bulk amounts not intended for sale to home users, must be reported.
d) Any substance is exempt to the extent it is used in a research laboratory, hospital or other medical facility under the direct supervision of a technically qualified individual. Quality assurance labs meet the exemption, but pilot testing labs, where manufacturing of a product takes place, do not.

e) Any substance used in routine agricultural operations or any fertilizer held for sale by a retailer to the ultimate customer is exempt. Again, this exemption applies only if you are the .um of the chemical, or in the case of fertilizers, if you are a retailer holding the fertilizer for sale to the ultimate customer.

Please note, there are additional exemptions in the Hazard Communication Standard (HCS) governing the preparation and maintenance requirements for Material Safety Data Sheets. However, the five exemptions noted here are the only ones that limit the scope of the HCS. So, if all of the hazardous chemicals present at your facility are exempt, then insert a "No" in that column of the chart. If any of your hazardous chemicals fail to meet these exemptions, then enter a "Yes" and proceed.

4. Thresholds

To ease everyone's information management burden created under community right-to-know, the Environmental Protection Agency (EPA} established reporting thresholds for the first two years of reporting. That means that any chemical present at your facility, always in an amount less than its threshold level, does not need to be automatically reported.

In addition to the "hazardous chemicals" (those indicated by a Material Safety Data Sheet), you need to be aware of a subset of these chemicals, the List of Extremely Hazardous Substances (EHS).

The extremely hazardous substances -- all included as "hazardous chemicals" under the Hazard Communication Standard (i.e., all require a MSDS) -- were listed initially in the November 17, 1986 Federal Register. Since then, 40 of them have been removed from the list after public comment. Revised lists can be obtained from your State Emergency Response Commission (SERC) or Local Emergency Planning Committee (LEPC). Also, you can write the Emergency Planning and Community Right-To-Know Information Line for a copy.

This list of extremely hazardous substances, consisting currently of 366 acutely toxic substances, represents the priority chemicals of the emergency planning effort.

Accordingly, reporting thresholds are lower for the extremely hazardous substances than for the non-EHS hazardous chemicals, and each EHS chemical boasts its own threshold planning quantity (TPQ).

The TPQ stipulates a storage level of concern for the substance if the entire quantity of that substance were released. Based on the toxicity and mobility of the chemical, the TPQ provides a reporting threshold reflecting health and safety concerns. The TPO for each of these chemicals is noted on the List of Extremely Hazardous Substances.

When considering thresholds, you must first determine whether or not the hazardous chemical is an extremely hazardous substance. Reporting thresholds vary between these two groups.

Those chemicals on the EHS list trip the threshold if present above 500 pounds or the chemical-specific TPQ, whichever is lower. Those hazardous chemicals not on the EHS list require reporting if stored above 10,000 pounds. For example, if you own a dry cleaning facility and never store perchloroethylene (a hazardous chemical) in a quantity greater than 5,000 pounds, then you are not required to report because the threshold for that chemical of 10,000 pounds was riot exceeded.

However, a recreational swimming pool with 5,000 pounds of chlorine (an extremely hazardous substance) surpasses the relevant 500 pound threshold and its threshold planning quantity of 100 pounds. (For EHS, always use the lower of 500 pounds or the TPQ).

After determining the "maximum amount" of all your non-exempt extremely hazardous substances and hazardous chemicals, check the chart for thresholds and respond appropriately. A "No" signifies that you do not need to report under community right-to-know. A "Yes" means you may need to report.

Please note, after the first two years of Title Ill reporting -- for manufacturers October 1989, and for non-manufacturers September 1990 -- these threshold levels may change.

Also, since the thresholds depend on pounds of the substance present at your facility, you may need to convert the measure of some gases and liquids from volume to weight. Again, it must be emphasized that if your inventory ever exceeds the threshold ("maximum amount" exceeds the threshold), for any length of time, then your reporting requirement is triggered.

In summary, if you answered "No" to any of the questions in the chart, then you are not required to report under Sections 311 and 312 of Title Ill. In other words, if you maintain no MSDSs, store no extremely hazardous substances and no hazardous chemicals above their respective thresholds, you are exempt for every reportable chemical at your facility, then you need not report automatically under community right-to-know. However, if you answered "Yes" to all of the questions, then you must report.

PLEASE NOTE: An average 55-gallon drum of chemicals weighs approximately 500 lbs., the EHS threshold.

How Do I Report?

Community right-to-know is a multi-step process for reporting, with different deadlines for manufacturers and non-manufacturers. Non-manufacturers report one year later than the manufacturers. The dates noted below highlight the timing for right-to-know requirements.

The reporting provisions of Sections 311 and 312 require submission of information to the State Emergency Response Commission (SERC), the Local Emergency Planning Committee (LEPC) and the local fire department.

Both your SERC and your LEPC are newly formed under Title Ill. They are the heart of the system. The SERC should be able to supply you with the address of your LEPC. Or, you could contact the appropriate Regional Office of the Environmental Protection Agency and obtain the information on the SERC and LEPC there.

Though Section 311 requires no special forms, you are responsible for obtaining the necessary report forms for Section 312.

The Local Emergency Planning Committee and/or your State Emergency Response Commission will serve as the key contacts. For Section 312 reports, you will need one of two annual inventory forms, namely a Tier I form or a Tier II form.

A facility must submit only one Tier I form annually. However, if you submit a Tier II instead, entries must be made for each reportable chemical at your facility. Since each Tier II form provides room for only three chemicals, you may need several copies.

October 17, 1987 - Manufacturing facilities subject to reporting under Sections 311-312 submit either Material Safety Data Sheets or a list of the reportable hazardous chemicals present at their facility to the State Emergency Response Commission, Local Emergency Planning Committee and fire department.

Beginning March 1, 1988 and continuing annually thereafter… Manufacturing facilities subject to reporting under Sections 311-312 submit either Tier I or Tier II forms to the State Emergency Response Commission, Local Emergency Planning Committee and fire department.

September 24, 1988 -- Non-manufacturing facilities subject to reporting under Sections 311-312 submit either Material Safety Data, Sheets or a list of the reportable hazardous chemicals present at their facility to the State Emergency Response Commission, Local Emergency Planning Committee and fire department.

Beginning March 1, 1989 and continuing annually thereafter… non-manufacturing facilities subject to reporting under Sections 311-312 submit either Tier I or Tier II forms to the State Emergency Response Commission, Local Emergency Planning Committee and fire department

What Do I Report?

Now that you have learned of your reporting responsibility, you must choose the best method for reporting.

Though Sections 311 and 312 of Title Ill share both a foundation in the Hazard Communication Standard and the thresholds for reporting, the two provisions entail separate reporting requirements.

Section 311 involves a one-time submission (with any necessary updates) naming the reportable hazardous chemicals present at your facility. Section 312 remains an annual responsibility, demanding more detailed information on your chemical hazards and handling practices.

Section 311

Again, you need no special forms under Section 311. Instead, the Material Safety Data Sheets at your facility are your key resources. Simply compile all of these MSDSs.

After taking out those hazardous chemicals exempted by Title 111 and those present below their thresholds, submit either copies of the remaining MSDSs or a single list of these chemicals, grouped by hazard category, to your State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC) and local fire department.

EPA recommends that you supply the list of your reportable chemicals rather than the actual MSDSs. The list will reduce your effort by removing the necessity of copying in triplicate all reportable MSDSs. It will also enhance the capacity of the three recipients -- SERC, LEPC and fire department – to manage your data responsibly and effectively.

However, if you do opt for submitting the list, then when necessary, the Local Emergency Planning Committee can request substantiating MSDSs as supplemental information. You have a 30 day period to comply with such a request. As noted above, the list must also be grouped by hazard, category.

Despite these added steps, the chemical list should greatly ease your reporting effort.

Both the list and the Material Safety Data Sheets should include the reportable hazardous chemicals present at your facility on your date of compliance.

The list or MSDSs were first due for the manufacturing sector on October 17, 1987, and are now required for non-manufacturing businesses no later than September 24, 1988.

If at any time after this initial submission you obtain a new, non-reported substance, or a hazardous chemical in your inventory exceeds its threshold for the first time, then either an updated list or the relevant MSDS must be sent to the State Emergency Response Commission, Local Emergency Planning Committee and fire department. You have 3 months to comply with this provision.

Section 312

Section 312, unlike Section 311, is an annual reporting requirement and cannot be fulfilled by a one-time submission.

Each year on March 1 (beginning for manufacturers in 1988 and for non-manufacturers in 1989), reporting facilities must submit reports on their inventories of hazardous chemicals, The reports, which cover the preceding year, can be submitted either on the Tier I or Tier II form.

Though Title Ill requires the Tier I submission, facilities may opt for the Tier II instead. The Environmental Protection Agency strongly recommends submission of the Tier II.

The Tier I and Tier II forms solicit similar information, including facility identification, types of substances by hazard category, and amounts and locations of hazardous chemicals in storage.

Tier I simply compiles the information by hazard category, whereas Tier II asks for specific details on each hazardous chemical.

The Tier II form demands more data, but actually serves as a first step to the Tier I. The Tier II offers another advantage-updating your inventory upon receipt of a new hazardous chemical builds more easily from the Tier II base than from the Tier I.

Therefore, while a Tier I report satisfies the law just as fully, you will probably choose to submit the Tier II in its place. By-passing the Tier I submission with the Tier II may save your company valuable time.

HOW DO I REPORT-SUMMARY

If you must report under community right-to-know -- i.e., you store, use or produce chemicals, requiring maintenance of a Material Safety Data Sheet under the Hazard Communication Standard, that are present at your facility in excess of the appropriate threshold, and are not exempt under Title Ill – then you must submit both Section 311 and Section 312 information.

Section 311 copies of the MSDSs of all those chemicals requiring reporting, or a single list of all those chemicals requiring reporting, grouped by hazard category, must be sent to the State Emergency Response Commission, Local Emergency Planning Committee and the local fire department, one time, with updates to reflect changes in your inventory.

Section 312 the aggregate Tier I information on all those chemicals requiring reporting, grouped by hazard category, or the chemical-specific Tier II data on all those chemicals requiring reporting, must be sent to the SERC, LEPC and the local fire department, annually every March 1.

Because the inventory reports involve so much effort and provide such value, a detailed Question & Answer section focusing on the Tier I and Tier II forms is included at the end of this brochure. These hints coupled with the instructions on each form should cover all of your concerns. If not, then please contact either your L.EPC or SERC, or the Emergency Planning and Community Right-To-Know Information line.

How Will This Information Be Used?

Now that you have fulfilled the reporting requirements of Sections 311 and 312, you understand the enormity of the information flow generated by Title Ill. With 1 roughly 5 million facilities in the country as potential reporters, community right-to-know will create a wealth of chemical information. Effective management and use of that data must follow.

Exactly what groups and uses will community right-to-know reporting serve? As noted earlier, the lists (or Material Safety Data Sheets) of your reportable chemicals and your Tier II (or Tier I) data must be sent to three recipients -- the State Emergency Response Commission, the Local Emergency Planning Committee and your local fire department. Each of these groups performs a role in Title Ill. The SERC integrates all the chemical-user data gathered across the state, enabling the accomplishment of state-wide goals. The LEPC, including all the affected sectors in the community (your neighbors), develops emergency response plans for the community. Fire departments, who also participate actively in the planning phase, can learn methods and precautions required in various emergencies. And public health officials, though not direct data recipients, will gain from Title Ill information.

The LEPCs' emergency response plans play the critical role in the Title Ill effort. These plans are designed to identify the major chemical dangers facing communities, so in the event of an accident, full knowledge of the hazards and proper emergency preparation will be readily available to the emergency responders. Community right-to-know reporting supports that process by collecting the essential data.

In addition to the established groups in the Title Ill structure, there will be another key participant – the general public. Perhaps, most important of all, Title Ill gave the community its right-to-know about chemical usage in the neighborhood. Even If you have no chemicals that trigger thresholds, you, the small business owner, may be required to provide your community with Information about chemical usage and storage practices. Anyone can request your Material Safety Data Sheets and Tier II forms by writing their Local Emergency Planning Committee, and you have 30 days to respond.

Just as the public can make requests beyond Title Ill reporting requirements, the State Emergency Response Commissions, Local Emergency Planning Committees and fire departments can ask for extra data on your chemicals, too. Only through broad access to chemical data can public officials plan fully for accidents and chart possible long-term health problems caused by hazardous chemicals. Though such right-to-know requirements can be burdensome, the value justifies the effort of the participants.

Trade Secrets

In some manufacturing processes and business practices, strict confidentiality must be maintained as protection against competitor firms. Section 311 and 312 disclosures can threaten that secrecy.

For this reason, companies can claim a chemical identity as a trade secret and modify this reporting requirement. Section 311 and 312 information must still be reported to the State Emergency Response Commission, Local Emergency Planning Committee and fire department, but the detail of the submission is reduced. A valid trade secret claim can protect the name of your hazardous chemical. Please note, since trade secrets can be claimed by suppliers, some downstream businesses may find themselves lacking the specific chemical identity information on their hazardous chemicals. In these instances, businesses can simply use the trade name of the substance in reporting under Sections 311 and 312. They will not need to make a trade secret claim.

Trade secret claims must be legitimate and must be substantiated upon submission of your community right-to-know information. This is accomplished through completion of a trade secret substantiation form, which you can obtain from EPA Headquarters in Washington, D.C. The actual trade secret claims and substantiations should be sent to the following address: Emergency Planning & Community Right-to-Know, P.O. Box 79266, Washington, D.C. 20024-0266

In making any trade secret claims, please follow the guidelines in the Federal Register explicitly. Incorrect submissions will not only jeopardize your trade secret claim, but may also result in a fine.

All justifications -- safeguards taken to protect your secret, the harm incurred in the event of disclosure, and proof that no other federal or state law requires the information and that discovery of the secret is impossible through reverse engineering -- must be sent to the address above.

There are strict rules in making trade secret claims, and your requests may be challenged by the public or reviewed by the EPA, so deny access to data only under vital and certain circumstances. Trade secret claims found to be frivolous can result in a fine of $25,000.

Conclusion

Community right-to-know reporting creates many new responsibilities and tasks for you, the small business owner -- from the time involved in reporting to any emergency planning duties resulting from your storage of extremely hazardous substances. However, the value of the program justifies this endeavor.

You and your community will benefit from enhanced safety. The emergency response plans developed from community right-to-know data will serve small businesses well. Now, in the event of an accident at your facility, fire fighters can protect you better; medical personnel can treat unusual chemical symptoms faster; property and lives may be saved. Also, the communication channels between chemical users and the public will be more effective. Finally, Title Ill may teach you valuable lessons about the hazardous chemicals used at your business. In fact, you may decide to substitute certain less hazardous substances for those you currently store, or you may simply improve your handling practices. And you can also avoid the costly fines threatened under Title Ill.

Community right-to-know was designed to fill a void of knowledge concerning chemical usage in our neighborhoods. Many hazardous chemicals play indispensable roles in our society. We cannot completely eliminate the risks, but we can prepare adequately for accidents to minimize their danger. We must all work together through effective preparation to prevent or minimize the devastation of a severe chemical accident. In this challenge, small businesses, along with all the other participants in Title Ill, will play a part. The combined effort can enhance all of our lives.

APPENDIX
Question & Answers for Sections 311 and 312 Reporting

1. Do I have to submit both Tier I and Tier II forms?
   No. Title Ill requires facilities with reportable chemicals to submit only the Tier I form to the State Emergency Response Commission, Local Emergency Planning Committee, and the local fire department. The Tier II form must be submitted only when these groups or the public request additional information. However, the Tier II form is actually a first step to the Tier I and serves as a useful worksheet for Tier I. Since Title Ill allows submission of the Tier II In place of the required Tier I, EPA recommends that facilities use the Tier II. This approach should ease your reporting effort.
2. How do I determine the "maximum amount"?
   You should start with the Tier II form. On the Tier II form, you must consider the daily (weekly, monthly) amounts (in pounds) of each reportable chemical at your facility. The amounts should vary as shipments Increase your inventory and regular use depletes it. The "maximum amount" occurs for each chemical when the storage level reaches its highest point for that year. Enter the appropriate two-digit code on the front of the form. The two-digit codes provide broad ranges (factors of ten) for indicating your storage levels. You need be no more exact than these ranges. Please note, reporting thresholds depend on the "maximum amount".

   If you do submit the Tier I, use the same procedure outlined above. Then for every reportable chemical, separate them into the five hazard categories. Add up all of the "maximum amounts" for the chemicals in each hazard category. Chemicals that overlap several categories will be counted more than once. Using this total, enter the appropriate two-digit code on the form for each of the five categories. Additional instructions are attached to both forms.

3. How do I calculate the "average dally amount"?
Again, the Tier II form should be completed first. Weights of reportable chemicals may be measured daily, weekly or monthly as appropriate to your type of operation. On the Tier II form, for every reportable chemical, consider the number of days (weeks, months) that chemical is at your facility and compute its daily (weekly, monthly) storage weight. Then, total these numbers and divide by the number of days (weeks, months) the chemical is on-site. Enter the appropriate two-digit code for the "average daily amount." These codes offer broad ranges, and you need to calculate your "average daily amount" only to an exactness within these ranges.
On the Tier I form, use the same procedure. Separate all of the reportable chemicals into their hazard categories. Then, total the "average daily amounts" of the chemicals in each category and enter the appropriate two-digit code on the form. Chemicals overlapping several categories will be counted more than once.
4. What Is the Chemical Abstract Service (CAS) number and where can I find it?
The Chemical Abstract Service (CAS) number is requested on the Tier II form as an informational aid for the Local Emergency Planning Committees and State Emergency Response Commissions. Though many chemical labels do not display the CAS number, Material Safety Data Sheets should. Also, the List of Extremely Hazardous Substances and the List of Toxic Chemicals (Section 313) cite the CAS numbers of their chemicals.
For mixtures (which frequently do not have a specific CAS number), note the CAS numbers of as many of the components in the mixture as possible. If you are unable to locate the CAS number tor a chemical, then submit the form without it. This requirement should not stop you from reporting accurately.
5. How specific must I be in reporting "general location"? Is a site plan necessary?
For both the Tier I and Tier II forms, you must indicate at least the building, lot, warehouse, shed, tank, field, etc. where the chemical is stored. On the Tier II form, where practical, the specific room in a building or quadrant of a field should also be noted. On the Tier I form, all the locations of each chemical contained in the hazard category must be reported. For example, if you store flammables in both warehouse A and lot C, cite both locations.
The Environmental Protection Agency recommends that you use a site-plan to indicate where chemicals are stored at your facility. Simply copy the facility plans and mark all appropriate storage areas for your reportable chemicals. Show all symbols and abbreviations in a complete, clear notation key.
If you submit Tier II information, you may request the LEPC, SERC and fire department to withhold location information from the public by using the "Confidential Location Information Sheet."
6. How do I convert volumes of liquids and gases into weight (pounds)?
Only the weight of the substance needs to be reported and not the weight of the container. The average weight of a full 55-gallon drum of chemicals is approximately 500 pounds. Most gases and liquids are sold by the pound, and these weights should be noted on the label. If so, then the weight of liquids can easily be estimated by multiplying the weight of the liquid in a full container by the fraction of the volume remaining. If the liquid is not labeled in pounds, then you can calculate its weight by multiplying the volume of the liquid by its density. The density (mass per unit volume) should be noted on the Material Safety Data Sheet. If not, then simply estimate the weight by the density of water. Be careful with your units of measure (gallons, liters, pounds, kilograms).
If the weight of the gas is listed on the cylinder's label, base your calculation on this measure. You can obtain the ''tare weight" (the weight of the cylinder without the gas) either from the label or by subtracting the listed weight of the gas from the total weight of the full cylinder. Knowing the tare weight, you can chart the weight of the gas remaining in the cylinder by subtracting the cylinder's tare weight from its total weight at that time. This procedure can be used for both liquefied and fixed gases.
If these methods fail, contact your supplier for assistance.
7. How can I locate my Standard Industrial Classificatlon code? My Dun & Bradstreet number?
Every type of business can be categorized by a Standard Industrial Classification (SIC) code. These codes range in specificity from two digits to seven. Title Ill requires the four-digit number. If you are not familiar with your facility's code, then check the front of most Dun & Bradstreet publications, such as the Million Dollar Directory, which should be located in your public library.
Every individual facility can be assigned a Dun & Bradstreet (D & B) number. These numbers code the facility for financial purposes.
If you have a D & B number but have forgotten it, you can retrieve it from your local Dun & Bradstreet office (check the White Pages}. If your facility does not subscribe to the D & B service, then you can obtain a "support number'' from the Dun & Bradstreet center located in Allentown, Pennsylvania (telephone: (215) 391-1886).
8. What if I fail to report under these requirements?
In addition to losing the benefits Title Ill offers your facility -- emergency response plans, improved public relations and potentially better management and chemical handling practices -- failure to report can trigger costly fines. Under Title III, failure to submit the list of reportable chemicals or the appropriate Material Safety Data Sheet (Section 311) results in penalties up to $10,000. Penalties associated with Tier I and Tier II

information (Section 312) range as high as $25,000 per violation. All fines can be assessed on a daily basis.

9. What is a hazard category? How can I determine the appropriate hazard category?
   Under Title Ill, there are five such physical (3) and health (2) categories – Fire Hazard, Sudden Release of Pressure, Reactivity, Immediate (acute) and Delayed (chronic). Hazard categories allow emergency responders to classify broadly the reportable chemicals present at your facility.

   Many employers are already familiar with the physical and health categories designated under the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (HCS).

   In addition, many Material Safety Data Sheets note a hazardous chemical's appropriate OSHA hazard category.

   For these reasons, the chart comparing the Title Ill categories with the HCS categories should be useful. The link between Title Ill's five categories and the twenty-three of OSHA is not exact, so use caution as you report. Contact your supplier for any additional assistance.

   As noted in the text, Section 311 lists and Section 312 Tier I forms require you to compile information by category.
10. How do I respond to requests for information from the public?
   If a request for information from the public comes directly to you, you can supply the information if you wish, or you can refer the person to the LEPC.

   Under Title Ill, the Local Emergency Planning Committee (LEPC) serves as the channel for public access. Citizens can request both the Material Safety Data Sheets and the Tier II information on your hazardous chemicals.

   If a citizen requests information on a chemical already reported to the LEPC, then they can address the concern immediately. Otherwise, the LEPC will request the information from you. You will have 30 days to respond.

   Even information on those hazardous chemicals present below the reporting thresholds can be obtained by the public. Again, you have 30 days beginning with the date on which you receive any such request to respond.
11. Who can serve as an emergency contact?
   Anyone who can be reached at all times to aid responders in the event of an emergency can serve as the emergency contact. Many small firms already post an emergency or "after hours" telephone number. That would be appropriate here. The emergency contact does not need to be an expert on chemical hazards, but must be able to act as a referral for responders. In case one emergency contact is not sufficient for 24-hour coverage, both the Tier I and Tier II forms have spaces for two emergency contacts.
12. Must I report a hazardous chemical that is on-site for less than 24 hours?
   Yes. Under community right-to-know reporting, any hazardous chemical on site for any length of time in excess of the established reporting threshold (and not exempt under Title Ill) must be reported.
13. What is the List of Extremely Hazardous Substances? How can I obtain a copy?
   The List of Extremely Hazardous Substances (EHS) currently contains 366 chemicals which present known acute health hazards. All of the chemicals are included under the Occupational Safety and Health Administration's definition of hazardous chemical – they are a subset. These chemicals were selected, as stipulated under Section 302 of Title Ill, as the priority chemicals of the emergency planning process. Due to this higher priority, these substances have a lower reporting threshold than other hazardous chemicals and also have chemical-specific threshold planning quantities, indicative of health concerns.

   Facilities where extremely hazardous substances are present incur another responsibility, namely participating in the emergency planning process. Under Section 302, these facilities had to notify the State Emergency Response Commission (SERC). They were required to designate a facility contact and provide the name to the Local Emergency Planning Committee (LEPC).

   The initial List of Extremely Hazardous Substances, published as a final rule in the Federal on April 22, 1987, contained 406 chemicals. Since that time 40 chemicals have been delisted, 4 of which were noted in the Federal Register on December 17, 1987, and the other 36 in the Federal Register on February 25, 1988. Updated lists can be compiled from these sources, or you can request them by writing your SERC, LEPC or from the Emergency Planning and Community Right-to-Know Information Hotline.
14. What do the storage codes "ambient" pressure and temperature, and "cryogenic conditions" mean?
   "Ambient pressure" means the pressure of the surrounding area. So, materials stored at ambient pressure are stored at the same pressure as that of the surrounding area. Most drums, bags, boxes, cans, etc. fit this category. Any gases stored in high-pressure containers should be reported as greater than ambient pressure.

   Similarly, ambient temperature means that the material is stored in the same temperature range as that of the surrounding area. Outdoor storage tanks that are heated or cooled to counter the variation in temperature should also be classified as ambient. However, a tank maintained at a high (or low) temperature not close to the normal range of temperatures of the region should be noted as greater (or less) than ambient temperature.

   Some gases are stored under "cryogenic conditions," that is, they are stored at very low temperatures (-130 degrees Fahrenheit or less). Examples of gases that may be stored this way include air, argon, carbon monoxide, ethylene, fluorine, helium, hydrogen, methane, nitrogen and oxygen.

For assistance in determining a chemical's storage conditions, contact your supplier or your local trade association. The Material Safety Data Sheet should also have some helpful data.

15. Do I have to report the hazardous components of a mixture?
Under Title Ill, the owner of a facility can choose to report all the components of a mixture separately or the mixture as a whole. The decision is yours and should be made on the basis of the substances at your facility.

For example, you can report the entire quantity of a particular paint stored at your facility as a bulk weight, noting the paint by its trade name in both the Section 311 and 312 reports. Alternatively, you could break down the various hazardous chemicals contained in the paint and calculate their respective weights. To do so, simply multiply the total weight of the mixture by the percentage composition of each hazardous chemical in the mixture. So, if compound A comprised 5% of the paint by weight, and the quantity of the paint at your facility was 10,000 pounds, then the amount of compound A would be 0.05 x 10,000 pounds, or 500 pounds. Again, the choice is yours.

The final rule for Sections 311 and 312 of the Emergency Planning and Community Bight-to-Know Act of 1986 was published in the Federal Register on October 15, 1987. It contains a detailed discussion of the reporting requirements of Sections 311 and 312, the Tier I and Tier II report forms, and instructions for these forms.

Hazard Category Comparison
For Reporting Under Sections 311 and 312

Environmental Protection Agency's Hazard Categories	Occupational Safety and Health Administration's Hazard Categories
Fire Hazard	Flammable Combustible Liquid Pyrophoric Oxidizer
Sudden Release of Pressure	Explosive Compressed Gas
Reactive	Unstable Reactive Organic Peroxide Water Reactive
Immediate (Acute) Health Hazard	Highly Toxic Toxic Irritant Sensitizer Corrosive Other hazardous chemicals with an adverse effect on a target organ that generally occurs rapidly as a result of short term exposure and with a short duration
Delayed (Chronic) Health Hazard	Carcinogens Other hazardous chemicals with an adverse effect on a target organ that generally occurs as a result of long term exposure and with a long duration

HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE: General Information and Comparison

INTRODUCTION

Under the authority of section 126 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title I), the U.S. Environmental Protection Agency (EPA) and the U.S. Occupational Safety and Health Administration (OSHA) issued identical health and safety standards to protect workers engaged in hazardous waste operations and emergency response.

The OSHA regulations, codified at 29 CFR 1910.120, became effective on March 6, 1990 (54 FR 9294). Corrections to these regulations were published on April 13, 1990 (55 FR 14072) to clarify certain medical surveillance requirements and to identify which employers must comply with 29 CFR 1910.120(p).

The EPA regulations, published on June 23, 1989 at 54 FR 26654, incorporate the OSHA standards by reference and are codified at 40 CFR Part 311.

The EPA and OSHA worker protection standards for hazardous waste operations and emergency response (HAZWOPER) affect employers whose employees are engaged in the following activities:

- Clean-up operations at uncontrolled hazardous waste sites when a government authority requires the cleanup (29 CFR 1910.120(a)(i));
- Corrective actions at treatment, storage, and disposal (TSD) facilities regulated under the Resource Conservation and Recovery Act (RCRA) (29 CFR 1910.120(a)(ii));
- Voluntary clean-up operations at uncontrolled hazardous waste sites (29 CFR 1910.120(a)(iii));
- Hazardous waste operations conducted at RCRA TSD facilities (29 CPR 1910.120(a)(iv)); and
- Emergency response operations without regard to location, where there is the release or a substantial threat of release of a hazardous substance (29 CFR 1910.120(a)(v)).

The purpose of this Fact Sheet is to explain the scope and purpose of the worker protection standards issued under SARA Title I, and to distinguish these standards from other regulations and consensus standards covering the same or similar subject matter.

This Fact Sheet is also designed to facilitate compliance with the HAZWOPER requirements by helping employers and other interested readers to understand their special responsibilities under these worker protection standards. For a summary of the HAZWOPER requirements, refer to Exhibit l.

This Fact Sheet is divided into five sections.

Section one gives a brief legislative history of the EPA and OSHA worker protection standards for hazardous waste operations and emergency response, and explains the responsibilities of these two agencies in implementing the standards, Sections two, three, and four compare the 1910.120 standards with other programs governing the same kinds of activities.

Finally, section five explains how to obtain the publications discussed in this Fact Sheet.

EXHIBIT 1

The Worker Protection Standards for Hazardous Waste Operations and Emergency Response (29 CFR 1910.120)

a) Scope, application, and definitions.	j) Handling drums and containers.
b) Safety and health program.	k) Decontamination.
c) Site characterization and analysis.	l) Emergency response by employees at uncontrolled hazardous waste sites.
d) Site control.	m) Illumination.
e) Training.	n) Sanitation at temporary workplaces.
f) Medical surveillance.	o) New technology programs.
g) Engineering controls, work practices, and personal protective equipment for employee protection.	p) Certain operations conducted under the Resource Conservation and Recovery Act of 1976.
h) Monitoring.	q) Emergency response to hazardous substance releases by employees not previously covered.
i) Informational programs.	

Overview of EPA and OSHA Worker Protection Authority

The Occupational Safety and Health Act of 1970, as amended, (OSH Act) established health and safety standards for the American workplace. Section 6 of the OSH Act established Federal authority to issue general health and safety standards for private industry: section 19 addresses standards for Federal government employees. Under the authority of section 6 of the OSH Act, OSHA promulgated general industry standards and standards that apply specifically to the construction industry; these standards are codified at 29 CFR 1910 and 1926, respectively. These standards set forth the minimum health and safety requirements necessary to ensure protection for all private sector employees in the United States. The scope of the coverage of the standards set forth in 29 CFR 1910 and 1926 changed dramatically on February 26, 1980, when President Jimmy Carter signed Executive Order 12196, requiring the Federal government to comply with the more stringent general industry standards issued under section 6 of the OSH Act.

SARA section 126(a) requires the Secretary of Labor to issue health and safety standards under section 6 of the OSH Act for the benefit of private sector employees -- and through the Executive Order, Federal employees -- engaged in hazardous waste operations and emergency response. Federal OSHA has no authority to enforce regulations protecting state and local government employees.

Under section 18 of the OSH Act, a state may elect to develop and implement its own occupational safety and health program if: (1) the state is willing to document its program in a state plan, and (2) the state's requirements are at least as stringent as the Federal regulations. Before a state program can become effective, however, OSHA must review and approve the state plan. Through its review and approval authority, OSHA requires states to extend occupational safety and health protection to state and local government employees, as well as to private sector employees, within the state's jurisdiction. Currently, there are 23 states and two territories with delegated OSHA programs. These state plans must be amended to incorporate the newly promulgated standards in 29 CFR 1910.120, to address the safety and health of employees engaged in hazardous waste operations and emergency response.

SARA section 126(f) requires the EPA Administrator to issue standards for hazardous waste operations and emergency response that are identical to OSHA's standards. Although the two sets of standards contain identical substantive provisions, EPA and OSHA address different audiences. EPA's authority extends to state and local government employers conducting hazardous waste operations and emergency response in states that do not have in effect a delegated OSHA program. Currently, 27 states, one territory, and the District of Columbia fall under EPA's authority. The EPA regulations cover both compensated and uncompensated state and local government employees engaged in the covered activities. Therefore, the EPA standards protect volunteers, such as volunteer fire fighters who are responding to hazardous substance emergencies. Although Federal OSHA recommends that delegated state programs also cover uncompensated employees, not all states have followed this recommendation.

In summary, in states without an OSHA-approved plan, Federal OSHA standards protect all private sector and Federal employees engaged in hazardous waste operations and emergency response; the EPA worker protection standards protect all state and local government employees, including volunteer workers. In states with an OSHA-approved plan, the state program covers all private sector employees, as well as state and local government employees; Federal OSHA covers Federal employees in those states.

Inter-Agency Agreement

EPA and OSHA have an agreement to share responsibility for implementing the Title I worker protection standards. Under the terms of this agreement, OSHA performs the following activities:

- Support of the National Response Team and Regional Response Teams.
- Technical Assistance. OSHA advises EPA on the types of actions EPA should take at uncontrolled hazardous waste sites to ensure full compliance with the HAZWOPER requirements. As an advisor, OSHA will identify problems that EPA may face and suggest appropriate solutions.
- Compliance Activities. OSHA conducts inspections and takes enforcement actions to ensure compliance with the worker protection standards at Superfund sites.
- Implementation Activities. OSHA supports EPA in conducting workshops to explain the requirements of the standards, and provides official interpretations of the health and safety requirements.

If you have questions on the substance of the worker protection standards for hazardous waste operations and emergency response, contact an OSHA Regional Office or OSHA's Office of Health Compliance Assistance in Washington, D.C.

The next three sections of this Fact Sheet compare OSHA's health and safety standards for hazardous waste operations and emergency response with several related regulations, standards, and guidelines developed by OSHA, EPA, and the National Fire Protection Association (NFPA). Be aware that in the context of this discussion, we will talk about "hazardous substances," "extremely hazardous substances" (EHSs), "hazardous materials," "hazardous wastes," and "highly hazardous chemicals." Each of these terms means something different, and the regulatory programs that employ them are intended to prevent or mitigate the effects from exposure to a distinct set of hazardous chemicals.

Comparing Regulatory Requirements Under SARA Title I, SARA Title III, and OSHA's Proposed Rule on Highly Hazardous Chemicals

SARA Title I

Under the authority of Title I, section 126 of SARA, EPA published worker protection standards for hazardous waste operations and emergency response (HAZWOPER). HAZWOPER specifies certain health and safety requirements to ensure the protection of employees engaged in hazardous waste operations and emergency response during five specified activities. HAZWOPER does not address emergency responders who engage only in handling traditional fire and medical emergencies; other OSHA programs protect these employees. HAZWOPER, however, requires that an employer provide, among other things, proper emergency response planning, training, and medical surveillance. Affected workers must be protected during the entire remedial process, from the preliminary evaluation and initial site entry to final closure of the site.

Emergency Response Planning. An employer must develop an emergency response plan to protect workers in an emergency resulting from the release of all kinds of hazardous substances, including EHSs, CERCLA hazardous substances, RCRA hazardous wastes, and any substance listed by the U.S. Department of Transportation as a hazardous material.

Training. An employer also must ensure that workers receive the kind of training specified in the regulation. The standard reflects a tiered approach to training, linking the amount and type of training to an employee's potential for exposure to hazardous substances and to other health hazards during a hazardous waste operation or an emergency response. The greater the potential hazard, the more extensive and stringent are the training requirements.

Medical Surveillance. HAZWOPER establishes a framework for a medical monitoring program for certain workers engaged in hazardous waste operations and emergency response. The medical surveillance requirements include provisions for a baseline, periodic, and termination medical examination for specific groups of employees. HAZWOPER also requires that employees receive a medical examination as soon as possible if they are injured or become ill from exposure to hazardous substances on-site or during an emergency, or develop signs or symptoms that indicate a possible overexposure to hazardous substances. Although an attending physician may determine the content of medical examinations required under the standard, the examination must address key elements related to handling hazardous substances.

SARA Title III

SARA Title III, or the Emergency Planning and Community Right-to-Know Act, is a law enacted to improve state and local government capacity to respond to an emergency caused by an accidental release of an EHS; and to disseminate information to the public on dangerous chemicals made, used, or stored in their community.

Think of this law as having four main parts. The first part, sections 302 and 303, requires each state to create a State Emergency Response Commission (SERC). In turn, these SERCs must create Local Emergency Planning Committees (LEPCs) that correspond to local emergency planning districts. LEPCs develop and update emergency response plans for accidents involving EHSs; and receive, manage, and provide public access to information about toxic and other hazardous substances in the district. SERCs review emergency response plans, and generally supervise and coordinate LEPC activities.

The second part of SARA Title III (section 304) sets out emergency release reporting requirements. Under this part of the law, the owner or operator of a facility from which an EHS or CERCLA hazardous substance is released at or above a reportable quantity (RQ) must notify SERCs and LEPCs in the affected area by telephone.

There must be a written follow-up report to this immediate notification. Both the initial and follow-up reports must give details on known or anticipated health risks and advice regarding medical attention.

The third part of SARA Title III (sections 311 and 312) gives people the right to know what substances are being made, used, or stored in their communities.

The OSHA Hazard Communication Standard (HCS) requires owners and operators to keep "material safety data sheets" (or MSDSs) with information about the health hazards of chemicals at the facility, and to make these MSDSs available to their employees.

SARA Title III piggy-backs on the MSDS requirements in the HCS. Under SARA Title III, the owner or operator also must send copies of MSDSs, or lists of chemicals with MSDSs, to SERCs, LEPCs, and fire departments. LEPCs, in turn, make this information available to the public during normal business hours.

The final part of SARA Title III (section 313) requires certain owners and operators to report toxic substances released from their facility -- whether the release is routine or accidental; and to report toxic substances they transport to another site as waste.

Of these four parts, the one that most closely parallels the SARA Title I worker protection standards is the part dealing with emergency response planning (section 303). There are nine emergency response planning elements in section 303 of SARA Title III.

Although these planning elements do not correspond point-for-point with the emergency response planning elements in the worker protection standards issued under SARA Title I, each program covers similar subjects. Title I

(HAZWOPER) and Title III emergency response planning elements both:

- Highlight the need for planning before there is an emergency;
- Require planners to identify emergency response decision-makers and other personnel;
- Require planners to develop guidelines for recognizing and evaluating releases;
- Require evacuation planning;
- Require that the emergency response plan set out an orderly sequence of steps to follow in an emergency;
- Direct planners to specify equipment that may be needed for various levels and types of emergencies; and
- Require testing the plan and providing appropriate training for emergency responders.

On the other hand, there are some important differences in emergency response planning requirements under Title I and Title III.

For example, a Title I plan must address a number of chemical hazards, while a Title III plan must cover only those emergencies arising from the release of an EHS. Further, a plan to protect employees under Title I may require far more specificity than a Title III plan. Although a Title III plan may be too general for use as an employer's Title I plan, the Title I plan may reference the Title III plan to avoid any unnecessary duplication of information. If a Title III plan is referenced, a copy of the referenced document must be kept with the Title I plan.

The most important thing to remember in distinguishing Title I and Title III emergency response planning is that Title I plans focus on worker safety; Title III plans focus on community safety. The similarities and differences between the Title I and Title III emergency response planning requirements are addressed in greater detail in a paper entitled "SARA Title l/Title III Emergency Response Planning Requirements." To obtain a copy of this document, contact the Environmental Response Team (ERT) of EPA in Edison, New Jersey.

OSHA'S Highly Hazardous Chemicals NPRM

On July 17, 1990, OSHA published a Notice of Proposed Rulemaking (NPRM), proposing a new regulation entitled "Process Safety Management of Highly Hazardous Chemicals" (55 FR 29150). The NPRM proposes requirements that will eliminate or mitigate the harm to employees as a consequence of chemical releases during the manufacturing or processing of highly hazardous chemicals. OSHA's proposed rule emphasizes management of hazards associated with highly hazardous chemicals, and defines a "highly hazardous chemical" as:

> A substance possessing toxic, flammable, reactive, or explosive properties.

The NPRM identifies 140 highly hazardous chemicals and proposes threshold quantities for each of the listed chemicals. The proposed requirements are similar to the worker protection standards issued under SARA Title I and the self-implementing provisions of SARA Title III in that each of these programs contains requirements for emergency response planning and employee training.

The NPRM requires an employer to establish and implement an emergency action plan under 29 CFR 1910.38(a).

An emergency action plan must include an evacuation plan through which an employer identifies persons responsible for an orderly exit and work area check in the event of an emergency; and directs employees to leave an emergency incident site, maintain a safe distance, and call an appropriate emergency response organization.

However, if an employer's highly hazardous chemical operation falls within one of the activities covered by HAZWOPER, the emergency response planning elements of 1910.120 apply. (Under HAZWOPER, an employer also may prepare a 1910.38(a) plan if the employer does not allow employees to respond to an emergency. If employees are allowed to respond, however, a more detailed emergency response plan is required.)

Title I, Title III, and the Highly Hazardous Chemicals NPRM also require training for workers commensurate with their assigned duties.

Comparing General Requirements Under 29 CFR Parts 1910 and 1926 with the Particular Requirements of 29 CFR 1910.120

The occupational safety and health standards published in 29 CFR set out minimum requirements to ensure protection for all private sector employees in the United States. The general industry standards contained in Part 1910 of Title 29 were derived largely from standards developed by industry consensus organizations and non-OSHA Federal safety and health standards. The 1910 requirements reflect practices already recognized in most industrial sectors before there was an Occupational Safety and Health Administration. Part 1910, however, makes those practices mandatory.

Many of the Part 1910 standards set out generic specifications for worker tools, tolerances and specifications for industrial structures, requirements for installing equipment that make the workplace safer (e.g., sprinkler systems), rules for providing medical attention, and other general health and safety practices applicable to all types of employment. Other sections in Part 1910, however, are specific to an identified activity or industry; HAZWOPER is an example of the latter type of standard.

Section 1910.120 (HAZWOPER) contains specific requirements to minimize the health and safety hazards associated with conducting hazardous waste operations and emergency response at uncontrolled hazardous waste sites and RCRA TSD facilities, and performing emergency response operations without regard for location.

In some instances, 1910.120 incorporates general worker protection provisions by reference. For example, 1910.120(g), Engineering controls, work practices, and personal protective equipment for employee protection, requires employers engaged in hazardous waste operations and emergency response to follow the provisions in 1910.94 through 1910.100 in setting up controls to protect employees from exposure to hazardous substances and safety and health hazards. Those referenced sections may apply to other industries and activities as well, but HAZWOPER applies only to hazardous waste operations and emergency response during the covered activities and locations.

If ever there appears to be a conflict between the general industry standards in 1910 or 1926 and HAZWOPER, the HAZWOPER requirements take precedent during the covered activities.

In addition to the requirements set forth under Part 1910, OSHA codified regulations in 29 CFR 1926 Subpart C that set forth safety and health standards specifically applicable to the construction industry. Part 1926 Subpart C includes safety standards for worker tools, and other standards relevant to health and safety in the construction environment (e.g., 29 CFR 1926.21 addresses programs for the education and training of employees and employers).

Parts 1910 and 1926 both require employers to provide whatever training and education is appropriate for employees to perform a given task safely. Appendix B in EP A's Health and Safety Audit Guidelines briefly summarizes the OSHA standards in 1910 and 1926 that may be most applicable to hazardous waste site activities; Exhibit 3 presents a list of these OSHA standards. For additional information on the standards listed in Exhibit 3 or on other OSHA standards, contact your local OSHA Regional Office.

Comparing the Section 1910.120 Standards and the NFPA's Hazardous Materials Incidents Publications

Private organizations sometimes publish consensus documents addressing subject matter covered in Federal regulations. The National Fire Protection Association (NFP A) has published two highly relevant documents: Recommended Practice for Responding to Hazardous Materials Incidents (NFP A 471), and Standard for Professional Competence of Responders to Hazardous Materials Incidents (NFPA 472). The NFP A standards are not Federal regulations.

EXHIBIT 3
Other Potentially Applicable OSHA Standards (by section in 29 CFR)

1910.20 Access to Employee Exposure and Medical Records	1910.181 Derricks
1910.24 Fixed Industrial Stairs	1910.252 Welding, Cutting, and Brazing
1910.27 Fixed Ladders	1910.307 Hazardous Locations
1910.28 Safety Requirements for Scaffolding	1910.1000 Toxic and Hazardous Substances
1910.38 Employee Emergency Plans and Fire Prevention Plans	1910.1200 Hazard Communication
1910.57 Ventilation	1926.20 General Safety and Health Provisions
1910.95 Occupational Noise Exposure	1926.21 Safety Training and Education
1910.101 Compressed Gases	1926.56 Illumination
1910.133 Eye and Face Protection	1926.59 Hazard Communication
1910.134 Respiratory Protection	1926.151 Fire Prevention
1910.135 Occupational Head Protection	1926.152 Flammable and Combustible Liquids
1910.136 Occupational Foot Protection	1926.200 Accident Prevention Signs and Tags
1910.141 Sanitation	1926.301 Hand Tools
1910.151 Medical Services and First Aid	1926.651 Specific Excavation Requirements
1910.165 Employee Alarm Systems	1926.652 Trenching Requirements

NFPA 471 offers guidance in identifying the minimum competencies a responsible authority should attain before responding to a hazardous materials incident, and specifies operating guidelines for a response. Like HAZWOPER, NFPA 471 covers, among other things, planning for an emergency response, ensuring that responders have the proper equipment at their disposal, and conducting an emergency response.

NFPA 472 is a competency standard for workers who respond to hazardous materials incidents. NFPA 472 training criteria differ from the 1910.120 standards in that the former do not establish specific hourly training requirements for emergency response personnel. There is no Incident Commander category in NFPA 472, but an Appendix to the standard does identify the role of an Incident Commander.

Indeed, the NFP A publications on hazardous materials incident response are similar in approach and breadth of coverage to HAZWOPER. In many instances, NFP A references the Federal standards. You must remember, however, that although the NFPA documents provide useful guidance to emergency response planners and responders, only the EPA and OSHA standards are mandatory Federal standards. If your organization falls within the scope of 29 CFR 1910.120, you must comply. Therefore, in any conflict between the NFPA Standard/Practice and the Title I worker protection standards, the Federal standards govern.

Where to Get Information and Publications

You can get any volume of the CFR by contacting the U.S. Government Printing Office (GPO) or any Federal Depository Library in your state. To contact GPO, call or write: Superintendent of Documents, Government Printing Office (GPO), Washington, D.C. 20402 (202) 783-3238

Many state college and university libraries are also Federal Depository Libraries. For a complete list of these libraries, ask GPO for A Directory of U.S. Government Libraries. OSHA offers a catalogue listing Agency-issued publications and audiovisual aids that help employers and other interested persons to understand both the scope of OSHA regulations, and specific substantive provisions in health and safety standards. You can obtain a free copy of the catalogue, OSHA Publications and Audiovisual Programs, by sending your request with a self-addressed mailing label to: U.S. Department of Labor, OSHA, Publications Office, Room N3101, 200 Constitution Avenue, NW, Washington, D.C. 20210

To get a copy of the NFPA publications discussed in this Fact Sheet, or to obtain additional information on the substance of the publications, write: National Fire Protection Association (NFPA), 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9904

For additional information on the SARA Title III requirements, contact the Emergency Planning and Community-Right-to-Know Hotline. The telephone numbers for the Hotline are: toll-free 800-535-7672

Currently, there are four other Fact Sheets that are available on the worker protection standards for hazardous waste operations and emergency response:

- Hazardous Waste Operations and Emergency Response: Uncontrolled Hazardous Waste Sites and RCRA Corrective Action (Pub. No. 9285.2-08FS) explains the specific requirements for hazardous waste operations conducted at uncontrolled hazardous waste sites, including corrective actions at RCRA TSD facilities.
- Establishing Work Zones at Uncontrolled Hazardous Waste Sites (Pub. No. 9285.2-06FS) describes the requirements and procedures for establishing support zones at uncontrolled hazardous waste sites.
- Hazardous Waste Operations and Emergency Response: RCRA TSD and Emergency Response Without Regard to Location (Pub. No. 9285.2-07FS) describes the principal requirements of the standards for hazardous waste operations at RCRA TSD facilities and emergency response operations without regard to location.
- Hazardous Waste Operations and Emergency Response: Available Guidance (Pub. No. 9285.2-lOFS) describes guidance materials developed by the Environmental Response Team to help workers engaged in hazardous waste operations and emergency response understand the HAZWOPER requirements.

EPA 9360.7-08-FS, September, 1992

NOTIFICATION REQUIREMENTS FOR CONTINUOUS RELEASES OF HAZARDOUS SUBSTANCES

HOME

Section 103(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), and EPA's implementing regulations (40 CFR 302.8), require the person in charge of a facility or vessel to notify government authorities immediately whenever a reportable quantity (RQ) of a hazardous substance is released into the environment, so that government response officials can evaluate the need for a response action. In addition to these CERCLA reporting requirements, section 304 of the Emergency Planning and Community Right-to-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III)), and EPA's implementing regulations (40 CPR 355.40), requires the owner or operator of a facility to notify state and local authorities immediately of any releases of CERCLA hazardous substances and extremely hazardous substances in amounts that equal or exceed an RQ.

Finally, CERCLA section 103(f)(2) provides relief from the immediate reporting requirements of CERCLA section 103(a) for releases of hazardous substances from facilities or vessels that are continuous and stable in quantity and rate. This fact sheet discusses .the requirements of the continuous release reporting regulations and addresses many key questions concerning their scope and applicability. (For additional information, please see Reporting Requirements for Continuous Releases of Hazardous Substances: A Guide for Facilities and Vessels on Compliance (Office of Emergency and Remedial Response, October 1990 EPA/540/G-91/003).)

Introduction

On July 24, 1990 (see 55 FR 30166, 40 CFR 302.8), the U.S. Environmental Protection Agency (EPA) promulgated regulations specifying requirements for reporting continuous releases of hazardous substances. The continuous release reporting regulation allows reduced reporting for facilities or vessels that release hazardous substances in a continuous and stable manner. This reporting relief applies to the notification requirements under CERCLA section 103(a) and SARA Title III, section 304.

CERCLA section 103(a) requires the person in charge of a facility or vessel to notify the National Response Center (NRC) immediately if that person has knowledge that the amount of a hazardous substance released into the environment from a facility or vessel over a 24-hour period equals or exceeds an RQ. The environment includes the ambient air, land, surface water, and ground water. The primary purpose of these notification requirements is to alert government officials to releases of hazardous substances that may require a timely response action to prevent or mitigate damage to human health or welfare or the environment. SARA Title Ill, section 304 requires the owner or operator of a facility to notify State and local authorities immediately of releases of CERCLA hazardous substances and extremely hazardous substances in amounts that equal or exceed an RQ.

Highlight #1: DEFINITIONS

Continuous. A continuous release is a release that occurs without interruption or abatement, or that is routine, anticipated, intermittent, and incidental to normal operations or treatment processes.

Routine. A routine release is a release that occurs during normal operating procedures or processes.

Stable in quantity and rate. A release that is stable in quantity and rate is a release that is predictable and regular in the amount and rate of emission.

The purpose of CERCLA section 103(f)(2) is to reduce unnecessary release notifications for releases of hazardous substances that are continuous and stable in quantity and rate. Neither the statute nor the continuous release reporting regulation, however, eliminates the requirement to report altogether. Continuous releases are not necessarily harmless or risk-free, and government response officials need to receive information about continuous releases of hazardous substances that equal or exceed an RQ in order to evaluate the need for a Federal response action.

ELIGIBILITY FOR REDUCED REPORTING UNDER THE CONTINUOUS RELEASE NOTIFICATION REQUIREMENTS

Facilities or vessels with continuous releases of hazardous substances may be eligible for reduced reporting under CERCLA section 103(f)(2) and the continuous release reporting regulation. A continuous release is a release of a hazardous substance that is "continuous" and "stable in quantity and rate" under the regulatory definitions codified at 40 CFR 302.8(b). A continuous release may be a release that occurs 24 hours a day, such as a radon release from a stock pile, or a release that occurs during a certain process, such as benzene released during the production of polymers, or a release of a hazardous substance from a tank vent each time the tank is filled. Some releases resulting from malfunctions also may qualify for reduced reporting as continuous releases under section 103(f)(2) if they are incidental to normal plant operations or treatment processes, are stable in quantity and rate, and either (1) occur without interruption or abatement or (2) are routine, anticipated, and intermittent. For example, releases from malfunctions that may qualify for reduced reporting include fugitive emissions from valves that occur at different rates over the course of a production cycle.

Highlight #2

The term facility has different regulatory definitions under CERCLA and SARA Title III; for continuous release reporting, the CERCLA definitions apply.

Facility: A Facility is defined as any building structure, installation, equipment, pipe or pipeline, well, pit, pond, lagoon, impoundment ditch, landfill, container, motor vehicle, rolling stock, or aircraft, or any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located. [See CERCLA section 101(9) and 40 CFR 302.3.]

Vessel: Vessel is defined as every description of watercraft or artificial conveyance used, or capable of being used, as a means of transportation on water. [See CERCLA section 101(28) and 40 CFR 302.3]

The source of a continuous release can be from a facility or a vessel. If you are releasing a hazardous substance from several sources at a facility or vessel simultaneously, you must aggregate the release of the hazardous substance across all sources to determine whether an RQ or more of the hazardous substance has been released.

REPORTING REQUIREMENTS FOR CONTINUOUS RELEASES

There is a three step process to reporting continuous releases under CERCLA and SARA Title III. In addition, further notification may be required if statistically significant increases in the quantity of a hazardous substance released or other changes in the release occur.

Initial Telephone Notification

You must make an initial telephone call to three separate government authorities: the NRC, the State Emergency Response Commission (SERC), and the Local Emergency Response Committee (LEPC). The initial telephone call will alert authorities to your intent to report a release as a continuous release; be certain your intent is clear to those receiving your telephone call. When you make the initial telephone notification, the NRC will assign a case number to your release report.

This case number will become the identifier for your facility or vessel, and is called the Continuous Release-Emergency Response Notification System (CR-ERNS) number. You must use this CR-ERNS number on all future release reports or correspondence related to continuous releases from your facility or vessel.

If a substance is being released from a number of different facilities at a site, the person in charge has the option of submitting one report for the entire site under one CR-ERNS number, or a separate report for each facility at the site. If the latter option is chosen, a separate CR-ERNS number should identify each separate facility.

Initial Written Notification

Within 30 days of the initial telephone notification, you are required to submit an initial written report to the appropriate EPA Regional Office. The purpose of this report is to confirm your intent to report your release as a continuous release under the requirements of section 103(f)(2), and to provide officials with sufficient information about the release to enable them to determine if the release qualifies as a continuous release and to identify the potential risks associated with the release.

In addition to this requirement, releases of CERCLA hazardous substances are also subject to the provisions of SARA, Title III section 304, and EPA's implementing regulations codified at 40 CFR Part 355, which require initial telephone and written notifications of continuous release to be submitted to the appropriate SERC and LEPC.

Highlight #3: REPORTING REQUIREMENTS -- 40 CFR 302.B(c) and 355.40(b)

The reporting requirements for continuous releases of CERCLA hazardous substances are:

1. Initial notification by telephone to the NRC, SERC, and LEPC; and initial written notification to the EPA Regional Office, SERC, and LEPC;
2. A one-time written follow-up report, one year later, to the appropriate EPA Regional Office;
3. Immediate telephone notification of a statistically significant increase in the quantity of a release to the NRC, SERC, and LEPC; and
4. Written notification within 30 days to the appropriate EPA Regional Office, SERC and LEPC of any other changes in the release.

The initial written report is divided into three sections. The first section contains general information about the facility or site, and the population around the site. In the second section, the owner of the facility provides information pertaining to the source, type, and amount of hazardous substance released, and the environmental medium to which the hazardous substance is being released. The final section determines the trigger for reporting statistically significant increases (SSI) in the hazardous substance release.

The initial written notification must contain information about the identity and quantity of the hazardous substances released from the source(s) at a facility. In particular, you must identify the upper and lower bounds of the normal range of each release and the total annual quantity released from each source during the previous year.

Highlight #4: DEFINITION OF NORMAL RANGE -- 40 CFR 302.8(b)

The normal range of a continuous release includes all releases of a hazardous substance (in pounds or kilograms) reported or occurring during any 24-hour period under normal operating conditions during the previous year. Only releases that are both continuous and stable in quantity and rate may be included in the normal range.

Follow-Up Report

Within 30 days of the first anniversary date of the initial written notification, you are required to reassess all reported continuous releases of CERCLA hazardous substances and to submit a one time, written follow-up report to the appropriate EPA Regional Office. The information required in the follow-up report is identical to that required in the initial written notification, but it should be based on release data and information gathered over the previous year (i.e., during the period since the submission of the initial written report). Thereafter, the continuous release must be reassessed annually to assure that information previously submitted has not changed.

Reports of Changed Release

You must notify the EPA Regional Office if there are any changes in a continuous release. If there is a change in the source or composition of a continuous release, the release is considered a "new" release and the reporting process must begin anew with a telephone call to the NRC and State and local authorities, and written reports to the appropriate EPA Region, SERC, and LEPC. A change in the source(s) or composition of a release may be caused by such factors as equipment modifications or process changes.

Changes other than those affecting the composition and source of the release must be reported to the EPA Regional Office in writing within 30 days of determining that the information previously submitted is no longer accurate. All notifications of changes in releases must include the original CR-ERNS number assigned to the facility or vessel by the NRC in the initial telephone notification.

Statistically Significant Increase Reports

A statistically significant increase (SSI) is any release of a hazardous substance that exceeds the upper bound of the normal range. An SSI in a continuous release of a hazardous substance must be reported to the NRC, SERC, and LEPC as soon as the person in charge is aware that the release exceeds the upper bound of the normal range. SSIs are a type of episodic release and are treated as such by the NRC. When reporting an SSI, therefore, the caller should anticipate that the NRC will ask for information that is similar to what is asked when a person reports any other episodic release incident. Be sure to identify the release as an SSI and provide the NRC with the CR-ERNS number previously assigned to your facility or vessel.

Recordkeeping Requirements

Supporting materials must be kept on file for a period of one year and should substantiate the normal range of the release, the basis for asserting that the release is continuous and stable in quantity and rate, and the other information included in the initial written report, the follow-up report, and the most recent annual evaluation.

EPA RESPONSE TO CONTINUOUS RELEASE REPORTS

When EPA receives a facility's continuous release information, the Agency will establish a record and create a file for your facility or vessel and enter the information into the Continuous Release-Emergency Response Notification System (CR-ERNS). EPA also will enter into CR-ERNS the information you submit in the initial written report and the follow-up report, any SSI reports, and any change notifications. Information in CRERNS will be stored both at the EPA Regional level and at the Transportation Systems Center in Cambridge, MA.

Assessment

EPA will use CR-ERNS to perform a preliminary assessment to determine if there is a threat to human health or the environment due to each continuous release of a hazardous substance. The potential threat posed by a continuous release is determined by assessing its toxicity, the quantity and frequency of the release, its fate and transport in the environment, and the proximity and nature of the potentially exposed population.

Regulatory Actions

EPA has the authority to respond to releases of hazardous substances under CERCLA sections 104 and 106. If

EPA has any doubts that the release is not continuous, the Agency may request additional information or require that the person in charge of the facility establish that the release is continuous by reporting it as an episodic release under CERCLA section 103(a) for a specified length of time.

EPA also may alert a permit program office or other office that a release from your facility or vessel merits further evaluation. Finally, EPA may decide to perform a site inspection or field response at your facility or vessel.

REPORTING WITH THE CR-ERNS INDUSTRY DISKETTE

EPA has made available a software package, the CR-ERNS Industry Diskette that allows the person in charge of a facility to submit initial written notifications on-diskette to appropriate agencies. In addition, the CR-ERNS software allows the user to submit follow-up reports, SSI reports, and change of release notifications.

CR-ERNS is "user friendly" and requires an IBM-compatible personal computer system to operate. The CR-ERNS Industry Diskette is available in either 3-1/2" or 5-1/4" floppy disks. Besides being user friendly, CR-ERNS offers several advantages in comparison to submitting hard- or typed-written notifications to EPA. Some of the advantages are provided below:

- CR-ERNS is structured so that more than one release may be recorded at a site;
- Its use can simplify the recordkeeping requirements for the person in charge of the facility; and
- CR-ERNS includes a detailed chemical database to assist users in the input of hazardous substance data.

Even if you use the Industry Diskette, however, you also must provide a signed printed version of your report to the EPA Region. To obtain a copy of the CR-ERNS Industry Diskette, call the National Technical Information Service.

Section V: Sources of Information

For more detailed information on how to comply with the continuous release reporting requirements, consult the following documents: 55 Federal Register 30166; July 24, 1990, U.S EPA, "Reporting Requirements for Continuous Releases of Hazardous Substances: A Guide for Facilities and Vessels on Compliance," Office of Emergency and Remedial Response, OSWER Directive 9360.7-01, October 1990.

U.S. EPA, "Continuous Release Emergency Response Notification System: User's Manual for Industry;· Office of Emergency and Remedial Response, OSWER Directive 9360.7-02, October, 1990.

To obtain the above documents or a copy of the CR-ERNS Industry Diskette, contact your EPA Region.

For initial telephone notifications, call: National Response Center (NRC), (800) 424-8802

Submit written continuous release notifications to the EPA Regional Office in your area.

OSWER 89.TORT, October, 1988

TORT LIABILITY IN EMERGENCY PLANNING

HOME

Prepared by John C. Pine, Ed.D, Associate Professor, Department of Agricultural Engineering, Louisiana State University Agricultural Center Under Contract With U.S. Environmental Protection Agency, October, 1988

SUMMARY

The threat of liability for government service in the context of Title III has been a subject about which there has been considerable interest. This report represents a review of the available information about tort liability in the Title III context and provides some guidance about how particular states fit within the general tort liability area.

Governmental officials and employees, business representatives, and other individuals who are members of a Local Emergency Planning Committee serve in an environment where the threat of liability suits is ever-present; however, the threat of liability judgments against the individuals involved is relatively remote.

Although the threat of personal and organizational liability exists, several levels of legal determinations must be considered before liability is attached to a particular situation. First, the question of whether negligence by or on behalf of the state exists. If this question is answered in the affirmative, then there is the question of whether state law provides qualified immunity to protect the interests of the state and those who serve it. Often this discretionary, proprietary, private duty or statutory immunity provides extensive protection for official agents of the state who perform their duties within the prescribed limits of their role and responsibility. It must be noted however, that the immunity is only qualified, and may be lost if the member's actions are willful or wanton.

Additionally, the fear of suits and the exposure of the member's personal resources is often addressed by statutory indemnification provisions. These statutes provide for legal representation and the provision of payments for any judgments that are rendered. Indemnification statutes are attempts to encourage public servants, paid and non-paid, to carry out their official obligations without fear of personal financial loss. Because a particular state's law is generally the determining factor on many questions of liability, members of Local Emergency Planning Committees should consult legal counsel in their state to discuss their duties, authority, status as an agent of the state, immunities, and indemnification.

Legal counsel can clarify the scope of individual and organizational liability so that local committees and their members can focus their attention on planning for hazardous materials emergencies.

I. INTRODUCTION

As the result of several well-publicized and disastrous incidents affecting individual health and the environment, accidents involving hazardous materials became real to individuals in the United States and around the world beginning in this decade. Accidental spills or releases of hazardous materials have the potential for inflicting health and -environmental damage and causing significant disruption in communities of all sizes. In recognition of this fact, in 1986 Congress enacted amendments to Superfund legislation (SARA Title III) which placed federal emergency planning requirements and community right-to-know provisions on state and local government.

Title III of SARA requires the Governor of each State to appoint a State Emergency Response Commission. Each state commission then designates Local Emergency Planning Committees, appoints committee members and supervises and coordinates the activities of the committees. The local committees are required to develop an emergency response plan for their community and to identify available resources which can be called on to respond to emergencies involving hazardous materials. The local committees also create a means of maintaining information on hazardous materials which are present in the community, and which Title III now requires be reported to them.

Many members of Local Emergency Planning Committees are concerned about the liability that may arise from their planning and administrative duties. The scope of liability is determined by both federal and state law.

II. LIABILITY UNDER FEDERAL LAW

Under the provisions of SARA Title Ill, Local Emergency Planning Committees are required to prepare a plan for responding to chemical spills and other releases of hazardous materials into the environment. Once the plan is developed, it must be reviewed at least once a year -- or more frequently, if circumstances warrant. Local committees must conduct exercises to implement the plan. They are required also to make recommendations concerning additional resources that may be necessary and the means for providing those resources to make the plan effective.

The law also requires that local committees make certain information available to the public. This would include, for example, the local emergency response plan, as well as forms indicating which hazardous materials are present in the community. Under the law, the federal courts may fine individuals or businesses which fail to report toxic and hazardous chemicals. Fines can also be assessed for failure to submit required reports such as materials safety data sheets or to provide required to report toxic and hazardous chemicals. Fines can also be assessed for failure to submit required reports such as materials safety data sheets or to provide required information to health professionals.

A person who has been denied access to information required by law, or who feels that the committee is not meeting the requirements of the law, may file suit in a federal district court against the governor or the State Emergency Response Commission. The court may order the governor or the commission to meet the requirements of the law, but the law does not provide for financial penalties against either entity (except in claims involving trade secrets).

SARA Title III does not provide authority for anyone to sue a local committee or a local committee member. However, this federal law does not prevent a person from filing suit under any other applicable federal, state or local law. Persons who feel that they have been harmed by a local committee, or by an individual member of that committee, may file suit in a state court under state law. Whether a Local Emergency Planning Committee, or one of its members, can be held liable is a question of state law.

III. LIABILITY UNDER STATE LAW

Major changes have occurred at the state level during the last twenty years with regard to the immunity of governmental jurisdictions from tort liability suits filed by individuals, businesses, or interest groups. Today, in many states, individuals and businesses may file suit against a public organization as well as the officers and employees of that organization.

Tort Liability

A tort is an action that harms another person, business, or group. It occurs when a person acts or fails to act, without right, and thus harms another directly or indirectly. A tort is an act for which a civil action for personal injuries or property damage, rather than a criminal suit. Each state, through its laws, regulations, and court decisions, recognizes certain rights of individuals and businesses. A state's tort law protects these rights by providing a means for a person or business to seek compensation for losses or harm caused by another. Tort law suggests that, under the principle of fairness, individuals harmed should be compensated to some degree for their loss. Tort law, less and less makes differentiation between harm by public and harm by private entities. The guidelines for filing a tort liability claim against a state or local governmental jurisdiction, or against individual employees or representatives of that jurisdiction, are established by the tort law of each state. This law determines how suits will be reviewed and defines the extent of the liability of governmental officers and organizations.

The Erosion of Governmental Immunity

For many years, most states and their political subdivisions enjoyed wide protection or immunity from civil suits filed by individuals seeking relief because of the wrongful conduct of public officials and employees.

This immunity was based on an English common law principle called Sovereign Immunity. Under English law, the sovereign (king or queen) traditionally could do no wrong. The sovereign and his or her representatives were thus immune from civil claims. This doctrine was adopted into American law, thereby extending immunity to the states and their political subdivisions. Until 1960, only five states allowed suits against a state or its political subdivisions. Beginning in the Sixties, however, state court decisions and legislative actions began to erode the protections of sovereign immunity. By the mid-1980s, every state in the Union had either laws or court decisions defining the extent of liability of governmental units and their officers, employees, or official representatives. These statutes and court decisions define:

- The scope of liability
- Areas of immunity
- Procedural requirements for making claims
- Damage limitations
- Indemnification provisions
- Means of providing insurance

In summary, then, the tort liability of state commissions, committees, or individual members is affected and shaped by:

- Governmental Liability and Immunity. The law in each state defines the extent of governmental liability and indicates whether immunity is recognized in special circumstances. The immunity may involve discretionary actions, governmental functions, or statutory provisions.
- State Action. Tort claims against a commission, committee, or its individual members are filed in state court. The state is generally named in the suit since commissions, committees, or individual members while serving in their official capacity act on behalf of and represent the state.
- Special Issues. If an action is filed against a member of a commission or committee, some states provide legal counsel or pay a judgment (indemnification). States may also be liable for the actions of the commission or committees (vicarious liability). Immunity provisions may apply, but could be lost for willful or intentional actions.

IV. GOVERNMENTAL LIABILITY AND IMMUNITY

The law of torts may allow suits against governmental jurisdictions with few restrictions or limitations, as in the case of Washington or Louisiana. Other states place extensive restrictions on suits against public agencies of the state or its political subdivisions, as is the case in Mississippi. The liability of governmental jurisdictions and their employees may be shaped by:

1. Negligence
2. Statutory Immunity

3. Discretionary Immunity
4. Governmental/Proprietary Function Test
5. Private Liability Test

These elements of the law define the extent to which governmental units and their employees or agents are immune from suit and indicate where they are liable. At the state level, the extent of immunity or liability is determined by state statutes and by decisions of the state courts. In order to understand the liability of Local Emergency Planning Committees and their members, one must know the law of the state and which principles of the law affect the scope of liability and immunity within that state.

Negligence

State tort law generally provides a means for individuals harmed by the actions of a governmental unit or its employees to claim compensation for their loss. Such a suit could claim, for example, that the governmental unit or its employee(s) failed to do what the reasonable and prudent person would have done under the circumstances. This, of course, is negligence. Negligence is an unintentional action which causes harm to another. It occurs when a person owes a duty to another and fails to act with skill, diligence, or care, thus causing harm to that person. The theory of negligence applies without regard to whether the cause of the harm is in the public or private sector. There are four elements of negligence:

1) The existence of a duty or standard of conduct created by judicial decision (common law) or by a provision in state law;
2) The failure to carry out the standard of conduct or duty;
3) A connection between the act of the wrongdoers (the governmental agency, employee, or agent) and the injury to another party (individual, business, or corporation), which the law recognizes as the legal cause of the harm; and
4) Actual loss or harm to the injured party(ies).

All suits involving negligence must have these four elements. The failure to satisfy each of these elements would result in dismissal of a claim of liability. The first element of negligence is the existence of a duty which establishes a standard of conduct for a public agency or a representative of that agency. This duty may be imposed by common law, which requires that a person or organization use reasonable judgment to determine whether conduct causes a risk of harm to others. In other words, a person or organization must use reasonable attention, perception, memory, knowledge, intelligence, and judgment in everyday actions.

A school administration, for example, has a common law duty to repair playground equipment that is unsafe. Public works departments have a duty to repair known road hazards within a reasonable time. Liability for failure to repair a hazard is determined by whether the department was informed that a danger exists and that such a danger created a significant threat to others. The common law duty to protect others is based on:

1) A significant threat or known hazard which presents a danger to others; and
2) Control of the property (the playground or roadway) by a public agency.

In addition to duties imposed by common law, duties may also be imposed on public organizations by state law. A statutory duty would include, for example, a requirement to inspect day care centers, repair traffic controls, correct safety hazards in the work place, or inspect public buildings.

These statutory duties may or may not specifically mention liability. They may simply establish a duty of care. Where liability is not specified, a court is generally free to adopt or reject the statutory duty in a claim. Where a statute provides for liability and penalties, the court will adopt the statute's standard of care and penalties. Liability may in these circumstances simply be determined by demonstrating that the statute was not carried out.

State law may require a State Emergency Response Commission or a Local Emergency Planning Committee to develop a current emergency preparedness or hazardous materials response plan. The failure to develop this plan and keep it current could be the basis for a suit against the state commission or local committee by individuals who believe that they were harmed by the failure of the commission or committee to carry out the law, i.e., that the committee was negligent in fulfilling its responsibilities.

Public officials, commissions, and committees often have broad discretion to make decisions involving public programs. Where such discretion is limited by statute, agency rules, or regulations, liability may exist. The limits of a committee's authority and discretion are thus a critical factor in determining the extent of immunity.

A finding of negligence depends on several factors. These include: the facts in the case, the circumstances surrounding the incident, the conduct of the alleged wrongdoer, and whether the actions of the wrongdoer were, in fact, the cause of the injury or harm. Differences in facts among cases, even though slight, may lead to different findings regarding liability, thus few generalizations are easily made.

Public officials who act in a reasonable manner and carry out the duties imposed by law are usually protected from liability. However, even when public officials fail to act in a reasonable manner or fail to carry out the requirements of a law, and that failure causes harm to others, they may still have protection under the law. This protection is called immunity.

Statutory Immunity

State law may specifically provide immunity from liability for certain actions. These may include emergency management activities, or actions involved in helping respond to, prevent, or manage an incident involving hazardous materials. This immunity provision may be narrowly drawn to provide protection only during a response, or it may be broadly defined to provide immunity in any emergency management or disaster activity. A committee member may have immunity under the law even if that person is negligent and has caused harm to others.

Two elements affect immunity of hazardous materials programs and activities under state law (including the activities of a state commission and a local committee):

1) The state disaster or emergency management statute may address the effects of natural, man-made, or attack disasters and provide immunity for emergency programs and activities. In this case, if a suit is brought, the court would evaluate whether activities of the local committee are a part of the state's emergency management program. If the statute specifically includes man-made or technological causes in the definition of a disaster, then the activities of the state commission and local committee may be immune from suit and protected by immunity provisions in the state emergency management statute.

   A provision in the state emergency management statute may provide immunity to a person while engaged in any emergency management activity, or may limit immunity during a response to a declared emergency.

   A state that has an immunity prov1s1on for any emergency management activity may choose to define emergency management. The term may be defined as any activity involved in planning, preparing for, and carrying out functions to prevent, minimize, or repair injury resulting from emergencies or disasters.

   Such a broad definition includes activities involved in planning, organizing, administering, and evaluating disaster programs and activities. In case of a suit, the courts could determine that the activities of a local committee fall within the planning and administrative provisions of the act and are thus immune from suit.

2) A state may also provide specific statutory immunity for actions involved in preventing, managing, or responding to emergencies involving hazardous materials. Since state commissions, local committees, employees, and authorized agents would be involved in preventing or responding to such an emergency, a law of this kind could provide immunity from suits.

Discretionary Immunity

In addition to immunity that may be provided under a state statute, high level public officials enjoy protection for their discretionary judgments and for decisions made within the scope of their position. This protection has been provided by judicial decisions involving suits against public officials and in legislative actions to protect public officials. It is available in almost all states. The intent of discretionary immunity is to free the public official from the fear of tort liability if the decision results in harm to another. Discretionary actions include policy-making decisions which chart the direction and extent of policies, programs, and activities. They do not include decisions concerning implementation of such policies, programs, or activities.

Discretionary immunity evolved from a concern on the part of courts and legislatures not to interfere with the executive decision-making process. This form of immunity is intended to address the claims of individuals harmed by the actions of public officials and employees, and not discourage well-qualified persons from serving in public positions.

The following questions clarify whether a decision is a discretionary action:

- Does the decision involve a basic governmental policy or program?
- Does the decision chart the course or direction of a program, activity, policy, or objective (as opposed to a decision which involves accomplishing the policy)?
- Does the decision require the exercise of basic policy judgment or expertise on the part of the government employee?
- Does the governmental agency possess the proper authority to make the challenged act or decision?

If the decision of the governmental agency or official involves these elements, then the decision is discretionary and is protected by immunity. If one or more of the questions are answered in the negative, further inquiry is necessary and liability may result. Discretionary immunity is not intended to exempt officers from liability. It simply provides them some measure of protection while exercising their judgment. It exists only when the agency or official has been delegated responsibility or authority for certain decisions or judgments.

It is essential, therefore, that members of a committee understand the scope of their duties and the limitations of their authority. Where members of a local committee make decisions which are within their authority, they may be exercising a discretionary action and may thus be immune from civil suit in state court.

Governmental/Proprietary Function Test

The law in fifteen states makes a distinction between governmental activities that are traditionally performed by public agencies and those activities that are proprietary or conducted by the private sector. For those states, a governmental or proprietary function test applies. Activities such as licensing, permitting, inspections, and public safety are performed by the public sector as an essential service for the public good. Therefore, immunity is granted in these areas. The protection exists even though the employee or agent may be negligent and cause harm to another.

Proprietary activities are performed by the public sector, but are similar to business ventures in the private sector. They might include, for example, services such as transit systems, parking garages, city hospitals, recreation services, and garbage collection. If an injury results from these services because of negligence, the courts could hold the public sector liable. States that recognize the governmental proprietary function test usually consider public safety, law enforcement or fire-fighting activities as governmental functions. These agencies operate with immunity.

Disaster and emergency preparedness units are generally designated as public safety operations, and therefore governmental functions which are immune from suit.

Care should be taken to identify those activities in a state which qualify as "governmental functions." Though variations occur, the law in each of the fifteen states defines which activities are governmental functions, and thus which activities have this immunity.

Private Liability Test

In Florida, the State Supreme Court adapted the governmental proprietary function test to create a form of immunity for public agencies in Florida referred to as the Private Liability Test. State law in Florida provides that public agencies are liable "to the same extent as a private person under like circumstances." In other words, if a duty does not exist for a private person under the same circumstances, then there would be no duty for the public employee or agent, and thus no liability. In order to clarify this private liability test, the court established four types of activities:

1) Legislative, permitting, licensing, and executive officer activities
2) Enforcement of the laws and protection of public safety
3) Capital improvements and property control operations
4) Provision of professional, educational, and health care services

The Florida Supreme Court held that there would be no liability for the action or inaction of governmental officials or employees in carrying out the activities of categories 1 and 2. Private individuals and businesses do not have a duty in licensing or permitting or with regard to protecting the health and safety of the community. Since private individuals or businesses do not have any legal duty in these areas, there is no legal duty placed upon public entities or individuals.

Professional, educational, and general services and activities such as the provision of medical care and educational services are performed by private persons as well as governmental entities. A standard of care governing actions in these areas is recognized in the private sector. Since a common law duty of care exists in the private sector, a public agency could be held to the same standard. There could be liability for activities which fit in categories 3 an 4.

V. STATE ACTION

In their laws or comprehensive tort liability statutes, many states include provisions that a governmental jurisdiction is responsible for the actions of its officers, employees, and agents. The official actions of the officials, employees, or agents performed within the scope of their duties and responsibilities are thus done on behalf of the agency of the state (state action). Where this principle of state action applies, individuals are generally protected from liability. A suit filed against an individual member of a State Emergency Response Commission or a Local Emergency Planning Committee for actions while serving the public agency would be a claim in the person's "official capacity" rather than individual or personal capacity. As long as the claim involves actions relating to the member's official duties, the suit will be filed against him in his official capacity as a representative of the agency (the state).

However, if the alleged violation evolves from actions outside the duties of commission or committee members, the court may consider the claim against the member to be in his individual capacity and therefore the individual may be subject to liability. A "state agency" may include all executive departments, agencies, boards, bureaus, and commissions of the state, the primary function of which is to act as instrumentalities or agencies of the state.

The term "employee" may be defined to include full- and part- time paid staff, volunteers, official agents, and appointed members of boards and commissions.

For example, in Alabama, an "employee" is an officer, official, employee, or servant of a governmental entity, including elected or appointed officials, and persons acting on behalf of any governmental entity in any official capacity in the service of the governmental entity.

In Arizona, an "employee" includes an officer, employee, or servant, whether or not compensated or part-time, who is authorized to perform any act of service (except independent contractors). "Employee" also includes uncompensated members of advisory boards appointed as provided by law.

A state commission, district, or committee formally created by the executive order of the governor or by state legislative action is thus an official agency of the state. A Local Emergency Planning Committee that is created by a State Emergency Response Commission and whose members are appointed by the state commission is also an agency of the state. If the members of the local committee are appointed by the state commission, then they represent the state rather than a city, county, or other political subdivision.

If the state commission authorizes or requires political subdivisions to appoint members of the local committee, the court could conclude that the local committee represents the political subdivision rather than the state. In this case, the law which would apply would be the law which applied to the political subdivision which made the appointment. Commission and committee members may qualify as "employees" as long as they are formally appointed under the laws of the state by a proper authority. The term "employee" may even apply to special advisors of the commissions and committees who work with or without compensation as long as they are formally authorized by the commission and do not serve as a private contractor.

Commission and committee members should review the meaning of the "state" and "employee" in their state to determine whether they are considered official agents of the state. Many Local Emergency Planning Committee members serve in a dual capacity as a member of the committee and as an employee of the political subdivision (city fire service, police department, or emergency management agency). As long as state law defines "employee" to include members of commissions, boards, or committees, the member's actions would be as an official agent of the state.

Depending upon the circumstances, however, the court could conclude that the actions of the committee member were outside is role and authority as a committee member, but were within his capacity as a local governmental employee. Actions outside their committee role could be viewed by the courts as acts of the local governmental employer. This distinction could result in a determination that the local government, for example, was liable for the act of the employee rather than the state which appointed the individual to the committee. Committee members should therefore understand their authorized role and responsibilities. Many local committee members are self-employed, employed by or represent a private business or non-profit corporation, or are a private citizen who is not employed. The actions of these local committee members would be considered state actions on behalf of the state as long as:

1) the local committee members are appointed by the state commission;
2) the state commission has the necessary state authority to appoint local committee members;
3) both the state commission and the local committee are agencies of the state;
4) state law recognizes the local committee members as agents of the state; and
5) the committee member is acting within the scope of his authority.

Under these circumstances, the state courts would ordinarily perceive suits against local committee members as suits in their official capacity or suits against the state and such suits would not subject the individual to personal liability.

VI. SPECIAL ISSUES

Although state, agencies, and their official agents may enjoy broad immunity under state law, the threat of liability suits against a state commission, committee, or individual members does exist. State law may allow civil suits in state court against a public agency or its representative. As a protection for employees and official agents who are sued, the state may provide legal counsel and also pay damages.

In many states, the employer or agency is, by law, vicariously liable for actions of its employees or agents. Under these circumstances, the agency provides legal counsel for the public official or agent and pays any judgment assessed by the court. The law usually specifies that the employee or agent must have been acting within his or her authorized role and did not intentionally cause harm to others.

Statutes granting indemnification or immunity from liability are intended to insulate officers and employees from civil claims arising out of their official duties. The agency is obligated to represent and pay damages for legitimate activities performed within the member's position. It is intended to extend protection for negligent acts, but not from gross negligence or intentional actions.

Despite the availability of statutory or judicial immunities, employees or official representatives of public jurisdictions may be held liable for conduct that is reckless, unjustifiable, or intentional, and that goes well beyond what the reasonable and prudent person would have done under the circumstances. Clearly, public employees and volunteers must understand that there are limits to immunity and indemnification. Indemnification also means that the agency will not seek restitution from the official or agent for the cost of the suit. Indemnification allows an agency to represent employees and officials, pay judgments, and be prohibited from seeking restitution from the individual. The agency is not, however, prohibited from taking disciplinary action against an employee whose actions justify punishment.

VII. CONCLUSIONS

While governmental officials and employees, business representatives, and individuals who are members of a local planning committee may serve in an environment where the threat of liability suits is ever- present, it should be remembered that the threat of liability judgments against the individuals involved is relatively remote.

Although the threat of personal and organizational liability exists, state law provides qualified immunity to protect the interests of the state. Discretionary, proprietary, private duty or statutory immunity provides extensive protection for official agents of the state who perform their duties within the prescribed limits of their role and responsibility. The immunity, however is only qualified, and could be lost if the member's actions are willful or wanton.

Finally, the fear of suits and the exposure of the member's personal resources is often addressed by statutory indemnification provisions. These provisions attempt to encourage public servants, paid and non-paid, to carry out their official obligations without fear of personal financial loss. Members of Local Emergency Planning Committees should consult legal counsel in their state to discuss their duties, authority, status as an agent of the state, immunities, and indemnification. Legal counsel can clarify the scope of individual and organizational liability so that local committees and their members can focus their attention on planning for hazardous materials emergencies.

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APPENDIX A: GUIDE FOR DETERMINING LIABILITY

To clarify the scope of liability under state law, members of local emergency planning committees should focus on the following points:

1) IS SOVEREIGN IMMUNITY ABOLISHED, RETAINED OR PARTIALLY WAIVED UNDER STATE LAW?
   If sovereign immunity is retained, abolished or partially waived, state statutes and court decisions will clarify what immunity exists in specific programs or actions. Appendix "B" provides an initial guide in determining the status of sovereign immunity in each state.

   Does the state have a comprehensive tort liability statute or a few provisions of the state code that describe the liability of governmental units?

   Appendix "B" identifies those states that have a comprehensive tort liability statute and those that have selected statutes addressing liability. Since in most cases, the State Emergency Response Commission and through them, the Local Emergency Planning Committees are appointed by the state (Governor), state tort law will determine the extent of liability for the Local Emergency Planning Committee and its members.
2) DOES STATE LAW RECOGNIZE DISCRETIONARY IMMUNITY?
   Almost all states recognize immunity for public officials exercising discretionary judgments. New Mexico is the only state that does not recognize discretionary immunity by law.
3) DOES THE STATE RECOGNIZE THE DISTINCTION BETWEEN GOVERNMENTAL AND PROPRIETARY ACTIVITIES, AND OFFER IMMUNITY FOR GOVERNMENTAL FUNCTIONS?
   States that recognize immunity for governmental functions may specifically include state emergency management programs and activities as governmental functions. Review the introduction to the emergency management statute in your state to see if emergency management is designated as a governmental function.
4) IMMUNITY IN EMERGENCY MANAGEMENT ACTIVITIES
   1. What is a disaster?
      Many state emergency management acts provide immunity for state and local jurisdictions involved in emergency management activities. The immunity provisions apply to hazardous materials emergencies if the term “disaster” is defined in the statute to include technological, man-made or human-caused events.

      Most state emergency management statutes define the term "disaster" in the introduction to the statute. Review the introductory section of your state emergency management act to see if disaster includes technological or man-made incidents. Appendix "B" notes those states that define "disaster" to include technological, man-made or human-caused events.
   2. Immunity Provision
      Does the state emergency management act have an immunity provision? If so, is immunity limited to designated disasters or does it apply in any emergency management activity? If your state provides for immunity in any emergency activity, you may be protected in planning or administrative activities, practice exercises, drills or training activities. Appendix "B" notes those states that have an immunity provision for any emergency management activity. To clarify what activities are included in emergency management refer to the definitions section of the state emergency management statute for a complete statement of what is meant by "emergency management.”
   3. Local Planning Requirements
      Twenty-five state emergency management acts include provisions requiring local governments to develop and maintain local emergency management plans. A jurisdiction may lose immunity provided in emergencies if they cause harm because a local plan was not developed or maintained. A citizen harmed as a result of a failure to meet a statutory duty to develop and keep current a local emergency management plan, could be the basis of a liability suit. Appendix "B" notes those states that require a local disaster plan.

HOME

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MEASURING PROGRESS IN CHEMICAL SAFETY: A Guide for Local Emergency Planning Committees and Similar Groups

Introduction

The Emergency Planning and Community Right to Know Act of 1986 (EPCRA) called for the establishment of local emergency planning committees (LEPCs).

LEPCs have broad-based membership whose primary work is to receive information from local facilities about chemicals in the community, use that information to develop a comprehensive emergency plan for the community, and respond to public inquiries about local chemical hazards and releases.

There are more than 3,000 LEPCs and they reflect the diversity of the country. Most LEPCs are organized to serve a county, some are for a single large city; others cover a larger area of the state.

Many LEPCs have expanded their activities beyond the requirements of EPCRA, encouraging accident prevention and risk reduction, and addressing homeland security in their communities.

Composed of representatives from all segments of the community interested in emergency planning and preparedness, LEPCs foster a valuable dialogue among members of the public, industry and government. In some communities LEPCs have formally aligned themselves with FEMA's Citizen Corps Program. These and similar groups can also use this guidance.

There is no doubt that LEPCs have made valuable contributions in chemical safety. This guide provides information about how LEPCs can measure their progress and determine if the actions they are taking continue to achieve the desired outcomes.

This approach is based on "Guidance on Developing Safety Performance Indicators related to Chemical Accident Prevention, Preparedness and Response for Public Authorities and Communities" published by the Organization for Economic Development (OECD) in December 2008. There is also a Guidance on Developing Safety Performance Indicators for Industry.

The full guidance may be found at www.oecd.org/ehs. An interactive website allows LEPCs to select and customize their review program at http://oecdsafetyindicators.org/.

Why Measure Progress?

LEPCs have important roles to play with respect to chemical safety. Setting goals and measuring progress allows you to take a step-by-step approach to reducing the likelihood of accidents and improving preparedness and response capabilities.

Depending upon local risks, capacities and conditions, there are several possible goals and metrics that can be applied to the activities of LEPCs. One size does not fit all. The advantage of this program for LEPCs is the ability to set goals and measure progress in a way that is specifically relevant to the community the LEPC serves.

Your LEPC may be evaluated by local government entities, the mayor, the city council, or a similar group, in order to determine an appropriate level of funding as well as whether the work of the LEPC deserves the time and attention of the membership. Industry may want to know if the chemical information (and often, the financial support) they provide is being used wisely and efficiently. Individual citizens may wonder if your work is effectively protecting them.

Federal agencies may use indicators of success to support grant funding and other decisions related to LEPCs. And, of course, you, as LEPC members may want to study what you are doing to see if you are satisfied with your work and whether your efforts have led to better protection of the community from chemical risks. All these and other issues can provide the reason to measure the progress of your LEPC.

How to Measure Progress

Many LEPCs expect a checklist of what they should be doing. However, it is better for LEPCs to have their own vision of success based upon the risks, capacities and conditions in the community they serve. That vision should be written, clear, and come from a group discussion of the concerns and motivations that caused the participants of the LEPC to join.

It may be that none of the LEPC members believe the vision is obtainable given current resources. That does not matter as long as the LEPC understands its mission is to make progress towards the vision.

The vision of success is an aspirational goal and should set the long-term objectives for the work done by the LEPC. Some LEPCs have adopted a vision of success along the lines of:

An engaged community with a broad safety and preparedness culture as show by:

- Robust emergency planning and personal preparation
- Effective and safe response
- Chemical accidents are prevented

Obviously, this or any vision of success cannot be achieved in one or two steps. It is, instead, achieved through a progression of activities designed to achieve milestones along the path to success. To define these steps LEPCs should establish both long-term and short-term goals that it believes will lead to achieving the vision of success. These goals should be a product of clear discussion and agreement among the LEPC membership.

Do not get distracted by terminology. For purposes of the Safety Performance Indicators (SPI) program, goals are often called "outcomes." The key distinction is that "outputs" are the products that your LEPC makes (e.g., your emergency plan, your evacuation plan) or things that you do (e.g., conduct monthly meetings) but they are not the goals or outcomes that lead to your vision of success. Instead, achieving a goal or outcome requires measuring the results from outputs or activities in a way that is relevant to the goals or outcomes.

For the purposes of SPI these results are called targets or metrics. In other words, when you set a goal it should be paired with what you are going to measure that tells you whether you are making progress towards the goal and when you have achieved the goal.

The following examples might help clarify the outcome/output distinction and the role of targets.

1. If your community has recently had a chemical release that led to injuries and deaths, the mayor or LEPC could establish a goal: no more injuries and deaths from a chemical accident in this community. That is a clear goal, perhaps overly ambitious in the eyes of some people, but one that is understandable and sensible in the context of your community's recent history.
   a. There are a variety of possible metrics/targets: no deaths or injuries this year, no accidental releases this year, and/or a 30% reduction in the number of accidental releases this year.
   b. As for "outputs," the products and/or activities that the LEPC undertakes to meet the metric/target for the goal, it could be a revised emergency plan, exercises to test the emergency plan, training for local responders, outreach materials for local citizens to ensure that they know the appropriate steps to take if there is an accidental release, improved notification systems to ensure that citizens are aware of a release, establishing a continuous dialog with industries in your community on risk reduction and accident prevention, and so forth.
   c. The LEPC then looks at the metrics/targets, including trends and changes over time, to determine if the outputs are productive and useful in achieving the goal.
2. You might have as a goal that local citizens be aware of the chemical hazards present in the community combined with a goal that will involve increased awareness of personal responsibility and appropriate actions in the event of an accident. Your target could be a specific annual increase in the number of people familiar with local chemical hazards. Measuring success could involve some process for interviewing citizens annually or citizen performance in exercises or other tests of emergency plans. "Activities or outputs" to achieve this goal could be public meetings at which chemical hazard information is shared, printed materials with maps showing the location of specific chemicals, video materials for use on television programs and/or at public meetings.
3. Another possible goal is to have all facilities in your community that are subject to EPCRA be in full compliance with the law. Targets could be an annual increase in the number of facilities that have submitted information or a reduction in the number of facilities found to be in noncompliance during inspections. Activities to accomplish these targets, might include an annual campaign focused on a specific industry sector, or a public campaign urging all facilities to submit the required information.
4. A specific preparedness goal might be for all students and teachers in local schools to be familiar with what actions they should take if there is a chemical release in the community with a possible impact on the school. A possible target could be the number of students/teachers who take the appropriate action during an exercise. As activities the LEPC could conduct training on hazard awareness, shelter in place, develop print and audio/visual materials, and/or prepare signs to post at strategic points.

Why Should You Care?

LEPCs face a terrible burden in demonstrating their worth and the worth of the activities they conduct. LEPCs lack a convincing way to demonstrate this worth because of a tendency to "do things" that seem obviously helpful, for example, hold meetings, make TV announcements describing your LEPC, practice implementing an emergency plan, and share information with the public about the dangers of chemicals in their community.

But it is not always clear that these apparently good activities actually contribute to reaching some vision of success. The various audiences served by LEPCs will have their own vision for the success of what LEPCs do and that vision may not be the same as what the LEPC would craft for itself.

As these examples and the discussion in Appendix I demonstrates, LEPCs should have a goal oriented reason when they choose their activities, and then be able to demonstrate that those activities helped them make progress in achieving their goals in a measurable fashion.

APPENDIX I

What Are Safety Performance Indicators and How Are They Used?

The OECD guidance uses the term "indicators" to refer to measures that provide insights into a concept (i.e., safety) that is difficult to measure directly. Simply put, the group first identifies some area of concern, then describes the target they want to accomplish in that area. Subsequently, they identify outcome indicators and activities indicators that can help them determine if they are meeting the target they established. (This is probably a bit murky to you. We will provide a detailed example in a bit.)

Outcome indicators help assess whether actions (e.g., policies, procedures) are achieving their desired results. Activities indicators provide you with a means to check regularly whether you are implementing your priority actions in the way you intended.

In this way, the activities indicators provide you an opportunity to understand why you are, or are not, achieving your target in a specific area.

As you might be guessing by now, choosing the indicators related to your situation is the key step in this entire process. And the good news is that the OECD guidance, often a bit difficult to understand (it was developed for use in many countries with varying safety customs and practices, with different words to describe their safety practices), is actually very helpful when it comes to choosing performance indicators.

In fact, once you have identified an area of concern and an appropriate target, the OECD guidance offers a list of possible outcome indicators and even more activities indicators.

You can choose to adopt the OECD language directly, or you can use the OECD list as a way to get you thinking more about the topic with the result that you develop your own indicators. (If you want to use the OECD language, the interactive website mentioned on the first page, http://oecdsafetyindicators.org/, will help you lift the OECD language directly into your local evaluation plan.)

Let's look at an example. Let's say that your LEPC wants to focus on communication with the public. You should find the OECD guidance for Public Authorities and Communities to be helpful.

There is suggested "target" language ("The public understands chemical risk information, takes appropriate actions in the event of an accident and has an effective channel to communicate with relevant public authorities.") Then there are at least eight outcome indicators, for example:

- Extent the public understands and remembers the chemical risk information that has been provided to them by public authorities.
- Extent the public is satisfied with chemical risk information provided to them by public authorities.
- The number and quality of comments provided by the public on the information they have received.

You can see that, if you chose these outcome indicators, you will need to develop a method for gathering data, and then actually gather the data, to know if the outcome indicators are being achieved. Next, you will find a list of potential activities indicators, for example:

- Is there a specific mechanism to share information between public authorities and the public openly and actively? Has this mechanism been designed in consultation with the public and other stakeholders?
- Is there a mechanism for the public to request information from public authorities and/or industry?

The activities indicators suggest actions and processes that you might want to have in place in order to ensure that the outcome indicators (and the underlying "target") are reached.

The activities indicators can often be answered with a "yes" or "no," but the real question is: will these activities promote chemical safety?

You can see that the options for activities indicators are very wide-ranging.

The good news is that, even though the OECD guidance does not provide an exhaustive list of activities indicators, it does provide some very good suggested indicators, which you can start with and adjust to meet your organizations specific needs

The SPI Process

Step 1: Gather a team.

Someone must be responsible for conducting the evaluation for your LEPC. The SPI Team could be the LEPC itself, a subcommittee made up of LEPC members, a committee whose members are totally outside the LEPC membership, or some combination of the latter two options.

In fact, there is another possibility: you might have a one-person team. You will know if there is someone in your community with special talents for this job. Even if you go with the idea of a committee, that "one-person team" could be the ideal chairman for the committee.

Whomever you choose as members, be sure that they are interested in evaluation, have the time to commit (one year, at a minimum), and enjoy the respect of your LEPC and political leaders.

You do not want the public to criticize the SPI results on the basis that the team members were not trustworthy.

Step 2: What are the key hazardous materials issues and concerns?

The OECD guidance has some good advice for this step. You probably know one or two issues that you would like to analyze. Or your SERC might identify an issue that it would like every LEPC in the state to address. Some very good advice from the OECD guidance: do not fall into the trap of asking what you can measure instead of what you should measure.

Step 3: What does success look like? & Step 4: Identify activities and establish a "yardstick" (outcomes) to show progress.

See the discussion above under "What are safety performance indicators."

Step 5: Do the activity. Collect the data.

See the OECD guidance. Note what they say about using existing data as well as not using too many data points when briefing upper management.

Step 6: Act on the findings.

See the OECD guidance. Note that, if there are inconsistencies in the results, it may indicate a problem in your safety program or a problem in the construction of your SPI program. This step involves addressing problems in your safety program.

Step 7: Evaluate and refine the process.

The results in Step 6 should lead you to look at both the safety program and the SPI program. Recall that you need a good list of activities indicators, and it might take time to come up with the right ones. The list in the OECD guidance should be helpful, but only your experience (plus some advice from your SERC if they are involved in the SPI process) can tell you if you need to revise the activities indicators. If Step 6 leads you to conclude that you have to change your activities indicators, do that and repeat the process as needed. (If you change or revise the activities indicators, you have already gotten to Step 4 for the second time.)

Some Specific Examples

The OECD guidance develops three scenarios (one each for a public agency, the local fire department, and a citizen committee) and shows what the SPI team would do at each step of the process.

As an LEPC, you will relate most closely to the citizen committee scenario, but you can also profit from following the other two scenarios through the process. Begin by reading the scenarios, and then study what actions are taken at each SPI step for each scenario.

You may find that one of the scenarios fits your situation; in that case, you might be able to lift a lot of material directly from the OECD guidance.

Let's go through one more example in detail so that you can see how the SPI process could be applied to a school lab cleanup project.

Scenario: Parents of students from the local high school, who are also members of the LEPC, discover storage of chemicals in the school lab while visiting the school during a parent/teacher conference.

Upon researching this further, the parents discovered that if these chemicals are not stored and handled properly, they can create a substantial hazard to students and first responders in the event of fire or spill.

The parents have approached the school and LEPC to work together to ensure processes are in place for the proper storage and handling of these chemicals and identify a mechanism to evaluate these processes.

The Process of an LEPC / High School Example	
1. Gather a team	• Representatives of the LEPC, fire department, and other relevant regulatory agencies. If any, along with the school principal and parents meet to scope the project.
2. What are the key hazardous materials issues and concerns?	• Following discussions among the team members, it was agreed that the "vision of success" was to reduce risk to students and faculty from chemical accidents. Key issues of concern included: o Developing appropriate procedures for the safe storage and handling of hazardous chemicals in school o Reducing the risks of a chemical accident by removal of old, unneeded, excess quantities or otherwise hazardous chemicals, and o Education of students and faculty on the hazards of chemicals used in the school labs.
3. What does success look like?	• The team determined that success of this effort would include: o Safe removal and disposal of unused, outdated and hazardous chemicals from the school lab. o All teachers and students are properly educated regarding the hazards presented and how to handle those chemicals. o Programs are implemented to prevent re-accumulation of chemicals, and o Procedures are implemented for proper storage and use of hazardous chemicals.
4. Identify activities and establish a "yardstick" (outcomes) to show progress.	• The metrics would include: quantities of chemicals removed, all teachers and students educated on chemical hazards of school chemicals, institution of inventory control programs measured by whether old or excess quantities are present term-to-term, and development of proper chemical storage procedures as measured by inspectors.

5. Do the activity. Collect the data.	• The team decided they would take an inventory of the amount and location of the hazardous chemicals and remove those that were a risk to the students and community. This is to be reported to the school, LEPC, and public via a public meeting and report. • The team also decided to institute procedures on the safe handling and storage of hazardous chemicals as well as a training program for teachers and students. Procedures are to be reviewed by the science faculty and re-evaluated each term. • The following data will be collected and reviewed: o Number of teachers/students trained on the procedures and competence of the teachers/students based on post-training/test. o Number of times procedures are not followed which will be tracked using log book sign in, observations by teachers of students using the chemicals, and number of accidents which occur due to misuse of the chemicals. o Number of times inspections showed a failure to follow procedures.
6. Act on the findings.	• The team agreed that each term, reports would be submitted to the school superintendent, PTA, student body, and LEPC with the results of the tracking of the activity indicators on inventory practices and chemical accidents. These reports would be reviewed by the LEPC/fire department and school administration and faculty to determine if changes need to be made in the procedures and/or the training program.
7. Evaluate and refine the process.	• At the end of each school year, the team would meet with the LEPC and PTA in order to review the project outcome and the activity indicators to determine if they need to be revised or eliminated and whether new indicators need to be developed and implemented, based on the results of the previous year and the experience gained in implementing the SPI programs.

Additional examples

LEPCs can submit to EPA any additional examples developed and implemented. These lessons learned will be shared on EPA's website, http://www.epa.gov/emergencies/.

Additional information and assistance

The "Guidance on Developing Safety Performance Indicators related to Chemical Accident Prevention, Preparedness and Response for Public Authorities and Communities" was published by the Organization for Economic Development (OECD) in December 2008. The full guidance may be found at www.oecd.org/ehs. LEPCs can use the interactive website at http://oecdsafetyindicators.org/ to select and customize their review program. Go to the website, click on "Communities," and then click on "My Targets and Indicators." After creating an account, you can log in and create pages appropriate to your scenario.

You can receive additional assistance by using the "Contact Us" function on the interactive website or by contacting EPA through our website http://www.epa.gov/emergencies/.

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OPPORTUNITIES AND CHALLENGES FOR LOCAL EMERGENCY PLANNING COMMITTEES: Federal Laws and Technical Assistance

HOME

What's Inside This Bulletin…

Your work to date has probably focused on complying with the community planning and right-to-know provisions of SARA Title III. Most local emergency planning committees (LEPCs).have been developing methods to manage MSDSs and Tier I and II reports; conducting hazards analyses; forming cooperative relationships with local facility owners and operators; and developing, exercising, and revising emergency plans.

Over the next few years, other laws and proposed regulations will affect your work. These laws will give you the opportunity to do a better job. You will have access to federal funding for your planning, training, and response activities. Additional information from facilities will make your hazards analyses more precise and will help you improve your community plans.

EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) will continue to offer various forms of technical assistance to LEPCs. This bulletin describes CAMEO™, a computer software package that can help you organize and use information about chemical hazards in your community. It also summarizes several laws and proposed regulations that will influence your work. The laws that this information bulletin focuses on are:

- The Hazardous Materials Transportation Uniform Safety Act of 1990;
- Section 123 of SARA;
- The 1990 Clean Air Act Amendments;
- The OSHA health and safety standards issued under SARA Title I;
- The Oil Pollution Act of 1990;
- The Pollution Prevention Act; and Other proposed federal regulations.

A Letter to LEPCs…

Over the past five years since the passage of SARA Title III, there have been many challenges that have faced you as members of Local Emergency Planning Committees. We have captured some, although clearly not all, of your successes in our "Successful Practices" series, which highlights innovative approaches to the implementation of the Emergency Planning and Community Right-to-Know Act.

Along with spreading the word on the achievements of your colleagues, we have provided you with technical information relating to specific chemicals in our "Advisory" series. In order to keep you informed of what tools and resources are available to assist you in your efforts, and also to provide you with the latest information on new legislation which will impact LEPCs, we have developed this bulletin, "Opportunities and Challenges for Local Emergency Planning Committees: Federal Laws and Technical Assistance"; EPA and other Federal agencies are continuing to work toward supporting you in meeting these challenges and in seizing these opportunities.

As you are probably aware, planning for and preventing chemical accidents is an ongoing process. It is encouraging to hear that some LEPCs are continuing to emphasize hazards analysis and are exercising and revising their plans. We hope that throughout the country, LEPCs will continue to work toward reducing chemical risks regardless of where in the process they are now. We further urge that LEPCs continue to press those industries and firms which have not yet submitted the required information to get full compliance.

Thank you for your involvement in this important program. We hope that this document will provide you with some new insights into the opportunities and challenges that we will be facing in the coming years.

Sincerely, Jim Makris, Director Chemical Emergency Preparedness and Prevention Office

COMPUTER AIDED MANAGEMENT OF EMERGENCY OPERATIONS (CAMEO™)

CAMEO provides the tools ~necessary to manage and use information collected under SARA Title III. The system was developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA to assist LEPCs, emergency responders, emergency planners, and others involved in activities concerned with the safe handling of chemicals, and is being used by local governments, fire departments, and industry throughout the United States, including the cities of Miami (Florida) and Portland (Oregon). CAMEO is now available for both Macintosh and IBM-compatible computers. The CAMEO system includes:

- Response information for over 3,000 chemicals commonly transported in the United States;
- Databases where you record Tier II chemical inventories and the locations of special populations;
- The capability to import Toxic Release Inventory Data;
- The ability to create scenarios using federal hazards analysis calculations to assist in emergency planning and overlay the estimated vulnerable zone on maps of your community;

- A mapping capability that allows you to identify the proximity and potential hazard posed by facilities to sensitive populations;
- A drawing capability to pinpoint locations of chemicals stored in your community on facility floor plans that you create; and
- An air dispersion model that can be used to help you evaluate spill scenarios and evacuation options for 700 airborne toxic chemicals (this feature is available for the Macintosh and is being developed for CAMEO D0S);

EPA will evaluate how CAMEO might be adapted to meet future information requirements imposed by new legislation. For information regarding CAMEO, contact your EPA regional office or the Emergency Planning and Community Right-to-Know Information Hotline at (800) 535-0202.

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION

The Chemical Emergency Preparedness and Prevention Office (CEPPO) publishes a series of Technical Assistance bulletins known as Successful Practices "in Title III Implementation. These bulletins describe procedures and strategies that are innovative and particularly effective in implementing programs required by Title III. By illustrating various aspects of programs from different areas of the country, LEPCs, SERCs, fire departments, and other Title III implementing agencies receive information which may prove useful to the development of their own program.

Each profile describes the LEPC, its organizational structure, and the area in which it functions. The activities undertaken by the LEPC, the lessons learned from those activities, and a contact person are provided for example, a recent profile described the Harford County, Maryland efforts to improve outreach by developing a public safety video and to increase state funding by organizing a caucus to support legislation that would help local jurisdictions recover the costs of implementing Title III.

For information on past issues, or if you know of Title III implementation efforts that would be of interest to others, contact the Emergency Planning and Community Right-to-Know Information Hotline at (800) 535-0202.

HAZARDOUS MATERIALS TRANSPORTATION UNIFORM SAFETY ACT OF 1990 (HMTUSA) – SECTION 117

LEPCs will be pleased to learn that HMTUSA, under the administration of the Department of Transportation, included funding grants for planning and hazmat training, as well as requiring curriculum development for responders. Reimbursable grants made under HMTUSA will be for approved planning and/or training activities. Specifically, HMTUSA:

- Provides for planning grants ($5 million per year from 1993 through i998) for:
  - Developing, improving, and implementing Title III plans, including the determination of transportation flow patterns of
  - hazardous materials; and
  - Determining the need for regional hazardous materials emergency response teams.
- Requires that states, to qualify for these planning grants, agree to pass through at least 75 percent of their planning grant directly to LEPCs to develop, improve, and implement emergency plans.
- Provides for training grants ($7 .8 million per year from 1993 through 1998) to states and Indian tribes for training public sector employees in hazmat response. These funds may be used for delivery of training, including tuition costs, student and trainer travel expenses, and room and board at training facilities.
- Requires that states, to qualify for these training grants, certify that they are complying with sections 301 (dealing with LEPC membership and rules) and 303 (dealing with LEPC plans and recommendations regarding resources) of SARA Title III.
- Provides that the Department of Transportation (DOT) (in coordination with other agencies) develop and periodically update a curriculum – a list of courses necessary to train public sector emergency response and preparedness teams. The Federal Emergency Management Agency (FEMA) is then to distribute the curriculum and updates to the Regional Response Teams (RRTs), SERCs, and LEPCs. .

LEPCs should immediately consult with SERC officials to learn about grants under HMTUSA. These grants might be used for HAZWOPER and other training activities. In addition, LEPCs now have a possible source of funding for conducting a transportation hazards analysis and generally improving their emergency plans.

REIMBURSEMENT FOR EMERGENCY RESPONSE ACTIONS (UNDER SECTION 123 OF SARA)

SARA not only includes Title Ill as a free-standing statute. It also includes (in Title I) section 123, an authorization for EPA to reimburse local governments for expenses incurred in carrying out temporary emergency measures in response to hazardous substance incidents. Reimbursement, however, must not supplant local government funds normally provided for emergency response.

Reimbursement under Section 123 covers activities such as erecting security fencing to limit access; responding to fires, explosions, and chemical releases; and other actions that require immediate response at the local level in order to prevent or mitigate injury to human health or the environment. EPA will consider reimbursement for costs of such items as disposable materials and supplies purchased and used for the response in question; rental or leasing of equipment used for the specific response; replacement of equipment contaminated beyond reuse or repair during a specific response; special technical services and laboratory costs; and services and supplies purchased for a specific evacuation. The following rules and restrictions apply to reimbursement under Section 123:

- Local governments must be in compliance with Section 303(a) of SARA Title III which requires the development of a comprehensive response plan. The sole exemption from this requirement is if the SERC has not established an LEPC for the locality in question.
- The law specifically limits reimbursement to $25,000 per response.
- Any local government may apply for reimbursement and only one request for reimbursement will be accepted for each emergency response action taken.
- When more than one local agency has participated in a response, those agencies must determine which single agency will submit the request on behalf of them all.
- EPA will distribute the reimbursement money to those applicants who demonstrate the greatest financial burden. Based upon the financial burden ranking for each request and the funds available for reimbursement; a request may be reimbursed, denied, or held over for reconsideration.

For more information on Section 123 and to obtain an application package, contact the RCRA/Superfund hotline at (800) 424-9346.

CLEAN AIR ACT (CAA) AMENDMENTS OF 1990

Accidental Release Provisions. Under the Clean Air Act Amendments, facilities are required to provide information on the ways they manage risks posed by certain substances listed by EPA and indicate what they are doing to minimize risk to the community. Specifically, under the accidental release provisions of the CAA Amendments:

- EPA must prepare and promulgate by November 1992 a list of at least 100 substances (with threshold quantities) that can cause death, injury, or serious adverse impacts to human health or the environment.
- In developing the list of substances, EPA is to consider (but not be limited to) the list of extremely hazardous substances (EHSs) under SARA Title III section 302, and must include the following 16 substances: chlorine, ammonia, anhydrous ammonia, methyl chloride, ethylene oxide, vinyl chloride, methyl isocyanate, hydrogen cyanide, hydrogen sulfide, toluene diisocyanate, phosgene, bromine, anhydrous hydrogen chloride, hydrogen fluoride, anhydrous sulfur dioxide, and sulfur trioxide.
- For any regulated substance present at a facility above the threshold quantity, owners or operators must prepare a risk management plan that includes:
  - A hazard assessment;
  - A program for preventing releases, including safety precautions as well as maintenance, monitoring, and employee training;
  - A response program, including notifying the public and local responders, providing emergency health care, and employee training.
- EPA must prepare guidance and regulations for risk management plans By November 1993. Facilities must comply with this requirement three years after the date of promulgation.
- Facilities must submit the risk management plan to states and local emergency planners, and make the plan available to the public.
- A Chemical Accident Safety Board is formed. LEPCs may want to participate in Board investigations and obtain results of those investigations in order to revise their plans, if necessary, to reflect Board findings. The Board may recommend federal, state, local, and industry actions to improve chemical safety.

Over the next three to four years, the accidental release provisions are likely to result in an influx of large quantities of facility-specific information to LEPCs. While this may pose some logistical problems initially, it presents a remarkable opportunity for LEPCs to obtain vital, current information about facilities that may have been difficult to obtain on a voluntary basis. These risk management plans, with their analysis of off-site impacts, could thus help LEPCs focus their efforts on high priority hazards in the community, both for planning and prevention purposes. LEPCs will also be better able to coordinate community plans with facility plans.

Process Safety Management of Highly Hazardous Chemicals. The Clean Air Act Amendments also require OSHA to publish new regulatory requirements for processes using highly hazardous chemicals. The term "highly hazardous" refers to those materials which possess toxic, flammable, reactive, or explosive properties as defined in the regulation. OSHA has proposed a list that delineates exactly which chemical$ fall under the regulatory definition. The proposed regulation establishes procedures and requirements for the safe management of hazards associated with industrial chemical processes. Workplaces covered by this new standard would be those conducting any activity that involves a highly hazardous chemical including any use, storage, manufacturing, handling, processing, or movement, or any combination of these activities at or above the threshold quantity specified by OSHA in the standard. These requirements are intended to prevent or minimize the consequences of major industrial accidents, thus protecting employees from the hazards of toxicity, fires and/or explosions.

Employer compliance with this standard will be of interest to LEPCs as it may reduce risk to the community. LEPCs may want to ask employers whether they are subject to the standard, and if so, whether they are complying with it. If LEPCs need process safety management information, they could get it from employers under the provisions of SARA section 303(d)(3). The Chemical Emergency Preparedness and Prevention Office (CEPPO) is working with OSHA to coordinate efforts under the new OSHA regulatory scheme with activities under the Clean Air Act Amendments to minimize confusion and overlap, and ensure that the two programs complement, rather that detract from, each other. LEPCs will need to understand how the two regimes interact and communicate this information to facilities, so that compliance with each can be ensured, and that the community hazards analysis and emergency plan can be kept up to date.

SARA TITLE I, HAZWOPER STANDARDS

Under the authority of Section 126 of SARA Title I (not Title III), EPA and OSHA issued health and safety standards to· protect workers engaged in hazardous waste operations and emergency response (HAZWOPER). The HAZWOPER standards affect employers whose employees are engaged in emergency response operations without regard to location, where there is a release or a substantial threat of release of a hazardous substance. OSHA's regulations do not cover volunteer responders; volunteers in states subject to EPA regulations are covered. The HAZWOPER standards cover emergency response planning as well as training:

- Emergency Response Planning. An employer (including public sector employers such as fire departments) must develop a Title I emergency response plan to protect workers during a release of all kinds of hazardous substances, including EHSs, CERCLA hazardous substances, RCRA hazardous wastes, and any substance listed by the U.S. Department of Transportation as a hazardous material.

The required elements of these employer-specific plans are similar to the required elements of LEPC plans. Indeed, employers may include parts of the LEPC plan in their Title I plans, which also must address coordination with outside parties. The HAZWOPER requirements reinforce the LEPC planning process by bridging on-site and off-site planning.

LEPCs may obtain the employer plans from employers under the provisions of SARA Section 303(d)(3). These plans will include information about the facility that should be helpful to LEPCs developing a comprehensive emergency plan.

- Training. The standard reflects a tiered-approach to training, linking the amount and type of training to an employee's potential for exposure to hazardous substances and to other health hazards during a hazardous waste operation or an emergency response. The greater the potential hazard, the more extensive and stringent the training requirements. Annual refresher training is required for all employees trained under the standard.

The LEPC may want to be involved in determining the appropriate level of training for public sector employees, based upon its community hazards analysis. The LEPC will need to know the training levels in order to develop the training schedules which must be a part of its plan. LEPCs should work with the state to pursue grants under HMTUSA to support training programs. (See the description of HMTUSA above.)

Note that Title I plans focus on worker safety, while Title III plans focus on community safety. Coordination between facilities and LEPCs should improve greatly when Title I plans are developed, as facilities that have completed worker safety plans have already done much of the work necessary to develop community plans, and should be more confident dealing with their LEPCs. LEPCs can use Title I in conjunction with Title III to integrate the best elements of individual facility plans into a comprehensive local emergency response strategy.

OIL POLLUTION ACT (OPA) OF 1990

The Oil Pollution Act (OPA) of 1990 includes national planning and preparedness provisions for oil spills that are similar to SARA Title III provisions for extremely hazardous substances. Specifically, the OPA:

- Establishes Area Committees under the direction of a federal On-Scene Coordinator (OSC) to develop contingency plans for specific areas at risk of damage from an oil spill. (EPA is responsible for Area Committees for inland areas, while the U.S. Coast Guard is responsible for those in coastal areas);
- Requires Area Committees to work with state and local officials (e.g., SERCs and LEPCs) to enhance state and local contingency planning and response;
- Requires owners or operators of certain vessels and facilities to prepare response plans, coordinated and consistent with LEPC plans, for worst-case oil and hazardous substance discharges; ·
- Requires consistency among facility/vessel plans, area contingency plans, and the National· Contingency Plan; and ·
- Requires regular drills (exercises) to test these plans.

The OPA is an opportunity for LEPCs to take the following steps:

- Coordinate their Title III plans with area and facility oil spill plans covering the same geographical area; whenever possible, coordinate and standardize response procedures for all hazards;
- Attend exercises required by the OPA and invite Area Committee members and federal OSCs to attend Title III exercises to ensure that lessons learned will be shared widely;
- Learn about the National Response System; incorporate the RRT and provisions for federal response assistance in its Title III plan as appropriate; include a federal OSC in

ongoing Title III preparedness activities is appropriate; and

- Consider submitting the Title III plan to the RRT (by way of the SERC) for review and comment. This can be done under current provisions of Title III section 303(g).

POLLUTION PREVENTION ACT

The Pollution Prevention Act represents a fundamental shift in the traditional approach to pollution control. Instead of concentrating on the treatment and disposal of wastes, it seeks to focus industry, government, and public attention on reducing the amount of pollution produced. Source reduction offers industry the potential to realize substantial savings from reduced raw material needs, pollution control, and liability costs. Source reduction also helps protect the environment and reduces risk to worker and public health and safety.

The following features of the Pollution Prevention Act are of particular interest to LEPCs:

- The establishment of a state matching grant program to promote the use of source reduction techniques by businesses;
- The creation of a publicly available source reduction clearinghouse;
- The implementation of source reduction and recycling data collection (source reduction and recycling data will be incorporated into the TRI database and made available subject to the confidentiality provisions of SARA Title III); and
- The streamlining and coordination of reporting requirements.

LEPCS should make themselves familiar with the Pollution Prevention Act and share their information with local facilities as well as with the general public, actively encouraging pollution prevention and source/hazard reduction. As facilities comply with the Pollution Prevention Act, LEPCs should regularly reassess the community hazards analysis and modify the emergency plan accordingly. LEPCS should also encourage facilities to seek and use the technical assistance made available under the grant program.

PROPOSED LAWS AND REGULATIONS

There are a number of proposed laws and regulations that could eventually have an impact on LEPCs, with regard to their compliance with and implementation of Title III requirements. We intend to update this document in the future, to reflect the passage of any relevant legislation that would affect LEPCs. As of this writing, the following regulations have been proposed:

Adding Explosives to the List of Extremely Hazardous Substances. The current list of extremely hazardous substances issued under section 302 of SARA Title III focuses on toxics that have lethal effects after a short exposure. Additionally, other hazardous chemicals are covered by the right-to-know reporting requirements under sections 311 and 312 if they are present in quantities greater than 10,000 pounds. EPA has determined that commercial explosives in quantities less than 10,000 pounds can produce serious damage if they are accidentally detonated in a community. In August 1990, therefore, EPA announced that it is considering adding chemicals to the SARA Title III section 302 list of extremely hazardous substances based on their explosivity.

If EPA's proposal takes effect, LEPCs will be required to include the listed explosives in their emergency plans. This means that LEPCs will need to:

- Understand the hazards associated with explosive chemicals;
- Identify where explosives are in the community; and
- Modify their plans to include emergency response to incidents involving accidental explosions.

EPA's Draft Stormwater Permit Rule. EPA has issued a draft regulation establishing general permit standards for Stormwater discharges under the Clean Water Act. In addition to requiring the development of stormwater management plans, this draft rule would require facilities in 19 sectors of American industry covered by section 313 of SARA Title III to test effluent for acute toxicity; construct diversionary structures to contain potentially contaminated stormwater (or, alternatively, to install drainage to keep stormwater from reaching storage areas where it could become contaminated); and protect storage piles from exposure to stormwater; wind-blowing and leaching.

In addition, chemical storage tanks would be required to have secondary containment systems sufficient to contain the material if the tank fails. Truck and rail car loading and unloading areas also would be required to have secondary containment sufficient to hold the contents of a breached tank.

LEPCs will want to coordinate their emergency plans with the stormwater management plans; In addition, LEPCs should inform themselves about any prevention steps that facilities take so that LEPC plans include an up-to-date evaluation of local hazards.

HOME

EPA 305-B-01-002, March, 2001

PROTOCOL FOR CONDUCTING ENVIRONMENTAL COMPLIANCE AUDTIS UNDER EPCRA AND CERCLA 103

Notice

U.S. EPA's Office of Compliance prepared this document to aid regulated entities in developing programs at individual facilities to evaluate their compliance with environmental requirements arising under federal law. The statements in this document are intended solely as guidance to you in this effort. Among other things, the information provided in this document describes existing requirements for regulated entities under the Emergency Planning and Community Right -to-Know Act (EPCRA) and under CERCLA Section 103 and their implementing regulations at 40 CFR 355 through 372 under EPCRA and 40 CFR 302 under CERCLA.

While the Agency has made every effort to ensure the accuracy of the statements in this document, the regulated entity's legal obligations are determined by the terms of its applicable environmental facility-specific permits, and underlying statutes and applicable state and local law. Nothing in this document alters any statutory, regulatory or permit requirement.

In the event of a conflict between statements in this document and either the permit or the regulations, the document would not be controlling. U.S. EPA may decide to revise this document without notice to reflect changes in EPA's regulations or to clarify and update the text. To determine whether U.S. EPA has revised this document and/or to obtain additional copies, contact U.S. EPA's National Center for Environmental Publications at (1-800-490-9198). The contents of this document reflect regulations issued as of January 31, 2001.

Acknowledgments

U.S. EPA would like to gratefully acknowledge the support of the U.S. Army Corps of Engineers Construction Engineering Research Laboratory (CERL) for providing suggestions for overall format of this document. The Office of Compliance at U.S. EPA gratefully acknowledges the contribution of U.S. EPA's program offices and the U.S. EPA's Office of Counsel in reviewing and providing comment on this document.

This document is intended solely for guidance. No statutory or regulatory requirements are in any way altered by any statement(s) contained herein.

Section I Introduction: Background

The Environmental Protection Agency (U.S. EPA) is responsible for ensuring that businesses and organizations comply with federal laws that protect the public health and the environment. U.S. EPA's Office of Enforcement and Compliance Assurance (OECA) has begun combining traditional enforcement activities with more innovative compliance approaches including the provision of compliance assistance to the general public. U.S. EPA's Office of Compliance Assistance was established in 1994 to focus on compliance assistance-related activities. U.S. EPA is also encouraging the development of self-assessment programs at individual facilities. Voluntary audit programs play an important role in helping companies meet their obligation to comply with environmental requirements. Such assessments can be a critical link, not only to improved compliance, but also to improvements in other aspects of an organization's performance. For example, environmental audits may identify pollution prevention opportunities that can substantially reduce an organization's operating costs. Environmental audits can also serve as an important diagnostic tool in evaluating a facility's overall environmental management system or EMS.

U.S. EPA is developing 13 multi-media Environmental Audit Protocols to assist and encourage businesses and organizations to perform environmental audits and disclose violations in accordance with OECA's Audit and Small Business Policies. The audit protocols are also intended to promote consistency among regulated entities when conducting environmental audits and to ensure that audits are conducted in a thorough and comprehensive manner. The protocols provide detailed regulatory checklists that can be customized to meet specific needs under the following primary environmental management areas:

- Generation of RCRA Hazardous Waste | Treatment Storage and Disposal of RCRA Hazardous Waste
- CERCLA | EPCRA
- Clean Air Act | Clean Water Act
- TSCA | Safe Drinking Water Act
- Universal Waste and Used Oil | RCRA Regulated Storage Tanks
- Managing Nonhazardous Solid
- Pesticides Management (FIFRA)

Who Should Use These Protocols?

U.S. EPA has developed these audit protocols to provide regulated entities with specific guidance in periodically evaluating their compliance with federal environmental requirements. The specific application of this particular protocol, in terms of which media or functional area it applies to, is described in Section II under "Applicability". The Audit Protocols are designed for use by individuals who are already familiar with the federal regulations but require an updated comprehensive regulatory checklist to conduct environmental compliance audits at regulated facilities.

Typically, compliance audits are performed by persons who are not necessarily media or legal experts but instead possess a working knowledge of the regulations and a familiarity with the operations and practices of the facility to be audited. These two basic skills are a prerequisite for adequately identifying areas at the facility subject to environmental regulations and potential regulatory violations that subtract from the organizations environmental performance. With these basic skills, audits can be successfully conducted by persons with various educational backgrounds (e.g., engineers, scientists, lawyers, business owners or operators). These protocols are not intended to be a substitute for the regulations nor are they intended to be instructional to an audience seeking a primer on the requirements under Title 40; however, they are designed to be sufficiently detailed to support the auditor's efforts.

The term "Protocol" has evolved over the years as a term of art among the professional practices of auditing and refers to the actual working document used by auditors to evaluate facility conditions against a given set of criteria (in this case the federal regulations). Therefore these documents describe "what" to audit a facility for rather than "how" to conduct an audit. To optimize the effective use of these documents, you should become familiar with basic environmental auditing practices. For more guidance on how to conduct environmental audits, U.S. EPA refers interested parties to two well-known organizations: The Environmental Auditing Roundtable (EAR) and the Institute for Environmental Auditing (IEA).

U.S. EPA's Public Policies that Support Environmental Auditing

In 1986, in an effort to encourage the use of environmental auditing, EPA published its "Environmental Auditing Policy Statement" (see 51 FR 25004). The 1986 audit policy states that "it is EPA policy to encourage the use of environmental auditing by regulated industries to help achieve and maintain compliance with environmental laws and regulation, as well as to help identify and correct unregulated environmental hazards." In addition, EPA defined environmental auditing as "a systematic, documented, periodic, and objective review of facility operations and practices related to meeting environmental requirements." The policy also identified several objectives for environmental audits:

- verifying compliance with environmental requirements,
- evaluating the effectiveness of in-place environmental management systems, and
- assessing risks from regulated and unregulated materials and practices.

In 1995, EPA published "Incentives for Self-Policing: Discovery, Disclosure, Correction and Prevention of Violations" – commonly known as the EPA Audit Policy – which both reaffirmed and expanded the Agency's 1986 audit policy (see 60 FR 66706 December 22, 1995). The 1995 audit policy offered major incentives for entities to discover, disclose and correct environmental violations. On April 11, 2000, EPA issued a revised final Audit Policy that replaces the 1995 Audit Policy (65 FR 19,617). The April 11, 2000 revision maintains the basic structure and terms of the 1995 Audit Policy while lengthening the prompt disclosure period to 21 days, clarifying some of its language (including the applicability of the Policy in the acquisitions context), and conforming its provisions to actual EPA practices. The revised audit policy continues the Agency's general practice of waiving or substantially mitigating gravity-based civil penalties for violations discovered through an environmental audit or through a compliance management system, provided the violations are promptly disclosed and corrected and that all of the Policy conditions are met. On the criminal side, the revised policy continues the Agency's general practice of not recommending that criminal charges be brought against entities that disclose violations that are potentially criminal in nature, provided the entity meets all of the policy's conditions. The policy safeguards human health and the environment by precluding relief for violations that cause serious environmental harm or may have presented an imminent and substantial endangerment. The audit policy is available on the Internet at www.epa.gov/auditpol.html.

In 1996, EPA issued its "Policy on Compliance Incentives for Small Businesses" which is commonly called the "Small Business Policy" (see 61 FR 27984 June 3, 1996). The Small Business Policy was intended to promote environmental compliance among small businesses by providing them with special incentives to participate in government sponsored on-site compliance assistance programs or conduct environmental audits. EPA will eliminate or reduce penalties for small businesses that voluntarily discover, promptly disclose, and correct violations in a timely manner.

On April 11, 2000, EPA issued its revised final Small Business Policy (see 65 FR 19630) to expand the options allowed under the 1996 policy for discovering violations and to establish a time period for disclosure. The major changes contained in the April 11, 2000 Small Business Policy revision include lengthening the prompt disclosure period from 10 to 21 calendar days and broadening the applicability of the Policy to violations uncovered by small businesses through any means of voluntary discovery. This broadening of the

Policy takes advantage of the wide range of training, checklists, mentoring, and other activities now available to small businesses through regulatory agencies, private organizations, and the Internet.

More information on EPA's Small Business and Audit/Self-Disclosure Policies are available by contacting EPA's Enforcement and Compliance Docket and Information Center at (202) 564-2614 or visiting the EPA web site at: www.epa.gov/oeca/ccsmd/profile.html.

How to Use The Protocols

Each protocol provides guidance on key requirements, defines regulatory terms, and gives an overview of the federal laws affecting a particular environmental management area. They also include a checklist containing detailed procedures for conducting a review of facility conditions. The audit protocols are designed to support a wide range of environmental auditing needs; therefore several of the protocols in this set or sections of an individual protocol may not be applicable to a particular facility. To provide greater flexibility, each audit protocol can be obtained electronically from the U.S. EPA Website (www.EPA.gov/oeca/ccsmd/profile.html).

The U.S. EPA Website offers the protocols in a word processing format which allows the user to custom-tailor the checklists to more specific environmental aspects associated with the facility to be audited.

The protocols are not intended to be an exhaustive set of procedures; rather they are meant to inform the auditor, about the degree and quality of evaluation essential to a thorough environmental audit. U.S. EPA is aware that other audit approaches may also provide an effective means of identifying and assessing facility environmental status and in developing corrective actions.

It is important to understand that there can be significant overlap within the realm of the federal regulations. For example, the Department of Transportation (DOT) has established regulations governing the transportation of hazardous materials. Similarly, the Occupational Safety and Health Administration (OSHA) under the U.S. Department of Labor has promulgated regulations governing the protection of workers who are exposed to hazardous chemicals. There can also be significant overlap between federal and state environmental regulations. In fact, state programs that implement federally mandated programs may contain more stringent requirements that are not included in these protocols.

There can also be multiple state agencies regulating the areas covered in these protocols. The auditor also should determine which regulatory agency has authority for implementing an environmental program so that the proper set of regulations is consulted. Prior to conducting the audit, the auditor should review federal, state and local environmental requirements and expand the protocol, as required, to include other applicable requirements not included in these documents.

Review of Federal Legislation and Key Compliance Requirements:

These sections are intended to provide only supplementary information or a "thumbnail sketch" of the regulations and statutes. These sections are not intended to function as the main tool of the protocol (this is the purpose of the checklist). Instead, they serve to remind the auditor of the general thrust of the regulation and to scope out facility requirements covered by that particular regulation. For example, a brief paragraph describing record keeping and reporting requirements and the associated subpart citations will identify and remind the auditor of a specific area of focus at the facility. This allows the auditor to plan the audit properly and to identify key areas and documents requiring review and analysis.

State and Local Regulations:

Each U.S. EPA Audit Protocol contains a section alerting the auditor to typical issues addressed in state and local regulations concerning a given topic area (e.g., RCRA and used oil). From a practical standpoint, U.S. EPA cannot present individual state and local requirements in the protocols. However, this section does provide general guidance to the auditor regarding the division of statutory authority between U.S. EPA and the states over a specific media. This section also describes circumstances where states and local governments may enact more stringent requirements that go beyond the federal requirements.

U.S. EPA cannot overemphasize how important it is for the auditor to take under consideration the impact of state and local regulations on facility compliance. U.S. EPA has delegated various levels of authority to a majority of the states for most of the federal regulatory programs including enforcement. For example, most facilities regulated under RCRA, and/or CWA have been issued permits written by the states to ensure compliance with federal and state regulations.

In turn, many states may have delegated various levels of authority to local jurisdictions. Similarly, local governments (e.g., counties, townships) may issue permits for air emissions from the facility. Therefore, auditors are advised to review local and state regulations in addition to the federal regulations in order to perform a comprehensive audit.

Key Terms and Definitions:

This section of the protocol identifies terms of art used in the regulations and the checklists that are listed in the "Definitions" sections of the Code of Federal Regulations (CFR). It is important to note that not all definitions from the CFR may be contained in this section, however; those definitions, which are commonly repeated in the checklists or are otherwise critical to an audit process are included. Wherever possible, we have attempted to list these definitions as they are written in the CFR and not to interpret their meaning outside of the regulations.

The Checklists:

The checklists delineate what should be evaluated during an audit. The left column states either a requirement mandated by regulation or a good management practice that exceeds the requirements of the federal regulations. The right column gives instructions to help conduct the evaluation. These instructions are performance objectives that should be accomplished by the auditor. Some of the performance objectives may be simple documentation checks that take only a few minutes; others may require a time-intensive physical inspection of a facility. The checklists contained in these protocols are (and must be) sufficiently detailed to identify any area of the company or organization that would potentially receive a notice of violation if compliance is not achieved. For this reason, the checklists often get to a level of detail such that a specific paragraph of the subpart (e.g., 40 CFR 262.34(a)(1)(i)) contained in the CFR is identified for verification by the auditor. The checklists contain the following components:

- "Regulatory Requirement or Management Practice Column" The "Regulatory Requirement or Management Practice Column" states either a requirement mandated by regulation or a good management practice that exceeds the requirements of the federal regulations. The regulatory citation is given in parentheses after the stated requirement. Good management practices are distinguished from regulatory requirements in the checklist by the acronym (MP) and are printed in italics.
- "Reviewer Checks" Column: The items under the "Reviewer Checks:" column identify requirements that must be verified to accomplish the auditor's performance objectives. (The key to successful compliance auditing is to verify and document site observations and other data.) The checklists follow very closely with the text in the CFR in order to provide the service they are intended to fulfill (i.e., to be used for compliance auditing). However, they are not a direct recitation of the CFR. Instead they are organized into more of a functional arrangement (e.g., record keeping and reporting requirements vs. technical controls) to accommodate an auditor's likely sequence of review during the site visit. Wherever possible, the statements or items under the "Reviewer Checks" column, will follow the same sequence or order of the citations listed at the end of the statement in the "Regulatory Requirement" column.
- "NOTE:" Statements "Note:" statements contained in the checklists serve several purposes. They usually are distinguished from "Verify" statements to alert the auditor to exceptions or conditions that may affect requirements or to referenced standards that are not part of Title 40 (e.g., American Society for Testing and Materials (ASTM) standards). They also may be used to identify options that the regulatory agency may choose in interacting with the facility (e.g., permit reviews) or options the facility may employ to comply with a given requirement.
- Checklist Numbering System: The checklists also have a unique numbering system that allows the protocols to be more easily updated by topic area (e.g., RCRA Small Quantity Generator). Each topic area in turn is divided into control breaks to allow the protocol to be divided and assigned to different teams during the audit. This is why blank pages may appear in the middle of the checklists. Because of these control breaks, there is intentional repetition of text (particularly "Note" Statements) under the "Reviewer Checks" column to prevent oversight of key items by the audit team members who may be using only a portion of the checklist for their assigned area.

Updates:

Environmental regulations are continually changing both at the federal and state level. For this reason, it is important for environmental auditors to determine if any new regulations have been issued since the publication of each protocol document and, if so, amend the checklists to reflect the new regulations. Auditors may become aware of new federal regulations through periodic review of Federal Register notices as well as public information bulletins from trade associations and other compliance assistance providers. In addition, U.S. EPA offers information on new regulations, policies and compliance incentives through several Agency Websites. Each protocol provides specific information regarding U.S. EPA program office websites and hotlines that can be accessed for regulatory and policy updates.

U.S. EPA will periodically update these audit protocols to ensure their accuracy and quality. Future updates of the protocols will reflect not only the changes in federal regulations but also public opinion regarding the usefulness of these documents. Accordingly, the Agency would like to obtain feedback from the public regarding the format, style and general approach used for the audit protocols. The last appendix in each protocol document contains a user satisfaction survey and comment form. This form is to be used by U.S. EPA to measure the success of this tool and future needs for regulatory checklists and auditing materials.

The Relationship of Auditing to Environmental Management Systems

An environmental auditing program is an integral part of any organization's environmental management system (EMS). Audit findings generated from the use of these protocols can be used as a basis to implement, upgrade, or benchmark environmental management systems. Regular environmental auditing can be the key element to a high quality environmental management program and will function best when an organization identifies the "root causes" of each audit finding. Root causes are the primary factors that lead to noncompliance events. For example a violation of a facility's wastewater discharge permit may be traced back to breakdowns in management oversight, information exchange, or inadequate evaluations by untrained facility personnel.

A typical approach to auditing involves three basic steps: conducting the audit, identifying problems (audit findings), and fixing identified deficiencies. When the audit process is expanded, to identify and correct root causes to noncompliance, the organization's corrective action part of its EMS becomes more effective. In the expanded model, audit findings (exceptions) undergo a root cause analysis to identify underlying causes to noncompliance events. Management actions are then taken to correct the underlying causes behind the audit findings and improvements are made to the organizations overall EMS before another audit is conducted on the facility.

Expanding the audit process allows the organization to successfully correct problems, sustain compliance, and prevent discovery of the same findings again during subsequent audits. Furthermore, identifying the root cause of an audit finding can mean identifying not only the failures that require correction but also successful practices that promote compliance and prevent violations. In each case a root cause analysis should uncover the failures while promoting the successes so that an organization can make continual progress toward environmental excellence.

Key Compliance Requirements

Emergency Planning (40 CFR 355.30) (EPCRA Section 302): A facility with quantities of extremely hazardous substances equal to or greater than the limits found in 40 CFR Part 355, Appendix A is required to notify the state emergency response commission within 60 days that the facility is subject to emergency planning requirements. The facility must designate a representative to participate in local emergency planning as a facility emergency response coordinator. The facility must also submit additional information to the local emergency planning committee upon request and notify them of any changes at the facility which might be relevant to emergency planning (i.e., designation of the emergency response coordinator, material changes in inventory) (40 CFR 355.10 through 355.30 and 40 CFR 355 Appendices A and B).

Emergency Release Notification (40 CFR 355.40) (EPCRA Section 304): Under Section 304 of EPCRA, a facility that produces, uses, or stores a hazardous chemical must immediately notify the designated state and local emergency response authorities if there is a release of a listed EHS or a hazardous substance that equals or exceeds the reportable quantity for that substance. Refer to 40 CFR 355, Appendices A and B for the EHSs. The hazardous substances are designated under CERCLA (see 40 CFR 302.4). If the release is a CERCLA-listed hazardous substance, the National Response Center (NRC) in Washington, DC, must also be notified (1-800-424-8802). If the release is transportation-related, a 911 call will meet the requirement of notification to the state and local authorities. The NRC must always be contacted for reportable transportation-related releases.

The initial notice should give as much information as possible about the release as long as notification is not delayed. The initial notification of a release can be made by telephone, radio, or in person, but must be followed by a written notice to the state and local emergency response authorities as soon as practicable (40 CFR 355.40(b)(3)).

Community Right-to-Know Requirements

MSDS Reporting (40 CFR 370.21): Under Section 311 of EPCRA, those facilities which are required under OSHA's Hazard Communication Standard regulations to prepare or have Material Safety Data Sheets (MSDSs) available are also required to submit copies of the MSDSs (or corresponding lists as described below) to the state emergency response commission (SERC), local emergency planning committee (LEPC), and the fire department with jurisdiction over the facility. MSDSs (or corresponding lists) must be submitted for each hazardous chemical present at the facility according to the following thresholds:

- All hazardous chemicals present at the facility at any one time in amounts equal to or greater than 10,000 lb. (4540 kg) (Note: Hazardous chemicals requiring an MSDS are chemicals designated by OSHA under 29 CFR 1910.1200), and
- All extremely hazardous substances present at the facility in amounts equal to or greater than 500 lb. (227 kg - approximately 55 gal) or the threshold planning quantity, whichever is lower.

If a hazardous chemical is present in a mixture, the facility can either provide information on the mixture or on each hazardous chemical component of the mixture.

Instead of submitting the MSDSs, the facility can submit a list of hazardous chemicals for which MSDSs are required, grouped by hazard category (e.g., immediate health hazard, delayed health hazard, fire hazard, sudden release of pressure hazard, and reactive hazard). The list must include the chemical or common name of each substance. If the facility provides a list, it must provide a copy of the MSDS for any chemical on the list within 30 days of a request from the local emergency planning committee.

If a new hazardous chemical exceeds the threshold limit or significant new information is discovered, the facility has 3 months to submit the revised list of chemicals or new MSDS.

Inventory Reporting (40 CFR 370.25, 370.40, 370.41): Under Section 312 of EPCRA, those facilities that are required under OSHA's Hazard Communication Standard regulations to prepare or have MSDSs available are also required to submit annual emergency and hazardous chemical inventory forms to the state emergency response commission, the local emergency planning committee, and the fire department that has jurisdiction over the facility. The Tier I form includes chemical categories, quantities, and locations of hazardous chemicals on-site. More detailed information may be requested by emergency response organizations, in which case facilities must submit a Tier II form within 30 days. Facilities also can choose to submit the Tier II form instead of a Tier I report. Either report must be submitted on or before March 1 of each year.

The information in these reports does not include accidental releases or permitted discharges and is specifically targeted toward hazardous chemicals requiring MSDSs that are present on-site above the following threshold levels:

- All hazardous chemicals present at the facility at any one time in amounts equal to or greater than 10,000 lb. (4540 kg), and
- All extremely hazardous substances present at the facility in amounts equal to or greater than 500 lb. (227 kg - approximately 55 gal) or the threshold planning quantity, whichever is lower.

Facilities who submit inventory forms must allow the fire department to inspect the site upon request and must provide specific location information about hazardous chemicals at the facility.

Toxic Chemical Release Reporting (40 CFR 372): Section 313 of EPCRA and Section 6607 of the PPA require certain facilities to report to the federal and state governments the annual quantity of toxic chemicals (listed in 40 CFR 372.65) entering each environmental medium, either through normal operations or as the result of an accident, quantities transferred offsite in waste, as well as other information. Facilities subject to this requirement must submit to EPA and state officials a toxic chemical release form (Form R) for each toxic chemical manufactured, processed, or otherwise used in quantities exceeding minimum threshold values during the preceding calendar year. Facilities that have a "reportable waste quantity" of 500 lb of a listed toxic chemical may take advantage of an alternate threshold of one million pounds. If the facility does not manufacture, process or otherwise use more than one million pounds, it may certify by filing a Form A certification statement rather than a Form R. Releases that must be reported include those to air, water, and land (including land disposal and underground injection). In addition, discharges to a POTW and transfers to off-site locations for treatment, disposal, energy recovery, and recycling must also be reported. Facilities must also report on the quantities of the chemicals treated, recycled, or combusted for energy recovery on-site.

Form R/Form A reports must be submitted to both the EPA and the state on or before July 1. Copies of Form R/Form A reports and related documentation must be kept at the facility for three years after the report is submitted.

The Pollution Prevention Act requires facilities subject to Form R/Form A reporting to also submit information on source reduction.

Key Terms and Definitions

- Act: The Superfund Amendments and Reauthorization Act of 1986 (40 CFR 355.20).
- Acts: Title III (40 CFR 372.3).
- Article: A manufactured item which (40 CFR 372.3):
  1. is formed to a specific shape or design during manufacture;
  2. has end use functions dependent in whole or in part upon its shape or design during end use;
  3. does not release a toxic chemical under normal conditions of processing or use of that item at the facility or establishments.
- Beneficiation: The preparation of ores to regulate the size (including crushing and grinding) of the product, to remove unwanted constituents, or to improve the quality, purity, or grade of a desired product (40 CFR 372.3).
- Boiler: An enclosed device using controlled flame combustion and having the following characteristics (40 CFR 372.3):
  1. all of the following:
     a) the unit must have physical provisions for recovering and exporting thermal energy in the form of steam, heated fluids, or heated gases; and
     b) the unit's combustion chamber and primary energy recovery section(s) must be of integral design. To be of integral design, the chamber and the primary energy recovery section(s) (such as waterwalls and superheaters) must be physically formed into one manufactured or assembled unit. A unit in which the combustion chamber and the primary energy recovery section(s) are joined only by ducts or connections carrying flue gas is not integrally designed; however, secondary energy recovery equipment (such as economizers or air preheaters) need not be physically formed into the same unit as the combustion chamber and the primary energy recovery section. The following units are not precluded from being boilers solely because they are not of integral design: process heaters (units that transfer energy directly to a process stream), and fluidized bed combustion units; and
     c) while in operation, the unit must maintain a thermal energy recovery efficiency of at least 60 percent, calculated in terms of the recovered energy compared with the thermal value of the fuel; and

    d) the unit must export and utilize at least 75 percent of the recovered energy, calculated on an annual basis. In this calculation, no credit shall be given for recovered heat used internally in the same unit. (Examples of internal use are the preheating of fuel or combustion air, and the driving of induced or forced draft fans or feedwater pumps); or
  2. the unit is one which the Regional Administrator has determined, on a case-by-case basis, to be a boiler, after considering the standards in 40 CFR 260.32.
- CERCLA: The Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (40 CFR 355.20).
- CERCLA Hazardous Substance: A substance on the list defined in section 101(14) of CERCLA. (NOTE: Listed CERCLA hazardous substances appear in table 302.4 of 40 CFR Part 302) (40 CFR 355.20).
- Chief Executive Officer of the Tribe: The person who is recognized by the Bureau of Indian Affairs as the chief elected administrative officer of the tribe (40 CFR 355.20, 370.2, and 372.3).
- Coal Extraction: The physical removal or exposure of ore, coal, minerals, waste rock, or overburden prior to beneficiation, and encompasses all extraction-related activities prior to beneficiation. Extraction does not include beneficiation (including coal preparation), mineral processing, in situ leaching or any further activities (40 CFR 372.3).
- Commission: The emergency response commission for the State in which the facility is located except where the facility is located in Indian Country, in which case, commission means the emergency response commission for the tribe under whose jurisdiction the facility is located. In absence of an emergency response commission, the Governor and the chief executive officer, respectively, shall be the commission. Where there is a cooperative agreement between a State and a Tribe, the commission shall be the entity identified in the agreement (40 CFR 355.20 and 370.2)
- Committee or Local Emergency Planning Committee (LEPC): The local emergency planning committee appointed by the state emergency response commission (40 CFR 355.20 and 370.2).
- Continuous: A continuous release is a release that occurs without interruption or abatement or that is routine, anticipated, and intermittent and incidental to normal operations or treatment processes (40 CFR 302.8(b))
- Customs Territory of the United States: The 50 states, the District of Columbia, and Puerto Rico (40 CFR 372.3).
- Disposal: Any underground injection, placement in landfills/surface impoundments, land treatment, or other intentional land disposal (40 CFR 372.3).
- Environment: Water, air, and land and the interrelationship which exists among and between water, air, and land and all living things (40 CFR 355.20 and 370.2).
- EPA: The United States Environmental Protection Agency (40 CFR 372.3).
- Establishment: An economic unit, generally at a single physical location, where business is conducted or where services or industrial operations are performed (40 CFR 372.3).
- Extremely Hazardous Substance: A substance listed in Appendices A and B of 40 CFR 355 (40 CFR 355.20).
- Extremely Hazardous Substance: A substance listed in the appendices to 40 CFR Part 355, Emergency Planning and Notification (40 CFR 370.2).
- Facility: All buildings, equipment, structures, and other stationary items that are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person). A facility may contain more than one establishment. Facility shall include manmade structures as well as all natural structures in which chemicals are purposefully placed or removed through human means such that it functions as a containment structure for human use. For purposes of emergency release notification, the term includes motor vehicles, rolling stock, and aircraft (40 CFR 355.20 and 370.2).
- Facility: All buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with such person). A facility may contain more than one establishment (40 CFR 372.3).
- Full-time Employee: 2000 hours per year of full-time equivalent employment. To calculate the number of full-time employees, total the hours worked during the calendar year by all employees, including contract employees, and divide the total by 2000 hours (40 CFR 372.3).
- Hazard Category: Any of the following (40 CFR 370.2):
  1. immediate (acute) health hazard, including highly toxic, toxic, irritant, sensitizer, corrosive, (as defined under Sec. 1910.1200 of Title 29 of the Code of Federal Regulations) and other hazardous chemicals that cause an adverse effect to a target organ and which effect usually occurs rapidly as a result of short term exposure and is of short duration;
  2. delayed (chronic) health hazard, including carcinogens (as defined under Sec. 1910.1200 of Title 29 of the Code of Federal Regulations) and other hazardous chemicals that cause an adverse effect to a target organ and which effect generally occurs as a result of long term exposure and is of long duration;
  3. fire hazard, including flammable, combustible liquid, pyrophoric, and oxidizer (as defined under Sec.

1910.1200 of Title 29 of the Code of Federal Regulations);
4. sudden release of pressure, including explosive and compressed gas (as defined under Sec. 1910.1200 of Title 29 of the Code of Federal Regulations); and
5. reactive, including unstable reactive, organic peroxide, and water reactive (as defined under Sec. 1910.1200 of Title 29 of the Code of Federal Regulations).

- Hazardous Chemical: Any hazardous chemical as defined under Sec. 1910.1200(c) of Title 29 of the Code of Federal Regulations, except for the following substances (40 CFR 355.20 and 370.2):
  1. any food, food additive, color additive, drug, or cosmetic regulated by the Food and Drug Administration.
  2. any substance present as a solid in any manufactured item to the extent that exposure to the substance does not occur under normal conditions of use.
  3. any substance to the extent it is used for personal, family, or household purposes, or is present in the same form and concentration as a product packaged for distribution and use by the general public.
  4. any substance to the extent it is used in a research laboratory or a hospital or other medical facility under the direct supervision of a technically qualified individual.
  5. any substance to the extent it is used in routine agricultural operations or is fertilizer held for sale by a retailer to the ultimate customer.
- Hazardous Substance: Any substance designated pursuant to 40 CFR 302 (40 CFR 302.3).
- Import: To intend a chemical to be imported into the customs territory of the United States and to control the identity of the imported chemical and the amount to be imported (40 CFR 372.3).
- Indian Country: Indian country as defined in 18 U.S.C. 1151 (40 CFR 355.20, 370.2 and 372.3):
  1. all land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation;
  2. all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state;
  3. all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.
- Indian Tribe: Those tribes federally recognized by the Secretary of the Interior (40 CFR 355.20, 370.2 and 372.3).
- Industrial Furnace: Any of the following enclosed devices that are integral components of manufacturing processes and that use thermal treatment to accomplish recovery of materials or energy (40 CFR 372.3):
  1. cement kilns
  2. lime kilns
  3. aggregate kilns
  4. phosphate kilns
  5. coke ovens
  6. blast furnaces
  7. smelting, melting and refining furnaces (including pyrometallurgical devices such as cupolas, reverberator furnaces, sintering machines, roasters, and foundry furnaces)
  8. titanium dioxide chloride process oxidation reactors
  9. methane reforming furnaces
  10. pulping liquor recovery furnaces
  11. combustion devices used in the recovery of sulfur values from spent sulfuric acid
  12. halogen acid furnaces (HAFs) for the production of acid from halogenated hazardous waste generated by chemical production facilities where the furnace is located on the site of a chemical production facility, the acid product has a halogen acid content of at least 3%, the acid product is used in a manufacturing process, and, except for hazardous waste burned as fuel, hazardous waste fed to the furnace has a minimum halogen content of 20% as-generated
  13. such other devices as the Administrator may, after notice and comment, add to this list on the basis of one or more of the following factors:
      a) the design and use of the device primarily to accomplish recovery of material products;
      b) the use of the device to burn or reduce raw materials to make a material product;
      c) the use of the device to burn or reduce secondary materials as effective substitutes for raw materials, in processes using raw materials as principal feedstocks;
      d) the use of the device to burn or reduce secondary materials as ingredients in an industrial process to make a material product;
      e) the use of the device in common industrial practice to produce a material product; and
      f) other factors, as appropriate.
- Inventory Form: The Tier I and Tier II emergency and hazardous chemical inventory forms set forth in Subpart D of 40 CFR 370 (40 CFR 370.2).
- Land Disturbance Incidental to Extraction: This includes: land clearing; overburden removal and stockpiling; excavating, handling, transporting, and storing ores and other raw materials; and replacing materials in mined-out areas as long as such materials have not been beneficiated or processed and do not contain elevated radionuclide concentrations (greater than 7.6 picocuries per gram or pCi/g of Uranium-238, 6.8 pCi/g of Thorium-232, or 8.4 pCi/g of Radium-226) (40 CFR 355.40)

- Material Safety Data Sheet or MSDS: The sheet required to be developed under 29 CFR 1910.1200(g) (40 CFR 370.2).
- Manufacture: To produce, prepare, import, or compound a toxic chemical. Manufacture also includes coincidental production of a toxic chemical during the manufacture, processing, use, or treatment of another chemical or mixture of chemicals, including a toxic chemical that is separated from that other chemical or mixture of chemicals as a byproduct, and a toxic chemical that remains in that other chemical or mixture as an impurity (>0.1% for carcinogens; otherwise >1%) (40 CFR 372.3).
- Management Practice: Practice that, although not mandated by law, is encouraged to promote safe operating procedures.
- Mixture (EPCRA 311, 312, and 313): Any combination of two or more chemicals, if the combination is not, in whole or in part, the result of a chemical reaction. However, if the combination was produced by a chemical reaction but could have been produced without a chemical reaction, it is also treated as a mixture. A mixture also includes any combination that consists of a chemical and associated impurities (40 CFR 372.3).
- Mixture (EPCRA 304): A heterogeneous association of substances where the various individual substances retain their identities and can usually be separated by mechanical means. Includes solutions or compounds but does not include alloys or amalgams (40 CFR 355.20).
- Normal Range: The normal range of a release is all releases (in pounds or kilograms) of a hazardous substance reported or occurring over any 24-hour period under normal operating conditions during the preceding year. Only releases that are both continuous and stable in quantity and rate may be included in the normal range (40 CFR 302.8(b)).
- Otherwise Use: Any use of a toxic chemical that is not covered by the terms “manufacture” or “process” and includes use of a toxic chemical contained in a mixture, trade name product or waste. Otherwise use of a toxic chemical does not include disposal, stabilization (without subsequent distribution in commerce), or treatment for destruction unless (40 CFR 372.3):
    1. the toxic chemical that was disposed, stabilized, or treated for destruction was received from off-site for the purposes of further waste management; or
    2. the toxic chemical that was disposed, stabilized, or treated for destruction was manufactured as a result of waste management activities on materials received from off-site for the purposes of further waste management activities. Relabeling or redistributing of the toxic chemical where no repackaging of the toxic chemical occurs does not constitute otherwise use or processing of the toxic chemical.
- Overburden: The unconsolidated material that overlies a deposit of useful materials or ores. It does not include any portion of ore or waste rock (40 CFR 372.3).
- Person: Any individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, state, municipality, commission, political subdivision of a state, or interstate body (40 CFR 355.20 and 370.2).
- Present in the Same Form and Concentration as a Product Packaged for Distribution and Use by the General Public: A substance packaged in a similar manner and present in the same concentration as the substance when packaged for use by the general public, whether or not it is intended for distribution to the general public or used for the same purpose as when it is packaged for use by the general public (40 CFR 370.2).
- Process: The preparation of a listed toxic chemical, after its manufacture, for distribution in commerce (40 CFR 372.3):
    1. in the same or different form or physical state from which it was received by the person preparing such substance, or
    2. as part of an article containing the toxic chemical. Process also applies to the processing of a toxic chemical contained in a mixture or trade name product.
- RCRA Approved Test Method: Includes Test Method 9095 (Paint Filter Liquids Test) in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (40 CFR 372.3).
- Release: Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any hazardous chemical, extremely hazardous substance, or CERCLA hazardous substance (40 CFR 355.20).
- Release: Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any toxic chemical (40 CFR 372.3).
- Reportable Quantity: For a CERCLA hazardous substance, the reportable quantity is the amount established in 40 CFR 302 Table 302.4. For an extremely hazardous substance, the reportable quantity is the amount established in 40 CFR 355, Appendices A and B (40 CFR 355.20).
- Routine: Routine release is a release that occurs during normal operating procedures or processes (40 CFR 302.8(b))
- Senior Management Official: An official with management responsibility for the person or persons

completing the report, or the manager of environmental programs for the facility or establishments, or for the corporation owning or operating the facility or establishment responsible for certifying similar reports under other environmental regulatory requirements (40 CFR 372.3).

- Stable In Quantity and Rate: A release that is stable in quantity and rate is a release that is predictable and regular in amount and rate of emission (40 CFR 302.8(b)) [Added April 1999].
- State: Any state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, any other territory or possession over which the United States has jurisdictions and Indian Country (40 CFR 355.20, 370.2 and 372.3).
- Statistically Significant Increase: A statistically significant increase in a release is an increase in the quantity of the hazardous substance released above the upper bound of the reported normal range of the release (40 CFR 302.8(b))
- Threshold Planning Quantity: The threshold planning quantity for an extremely hazardous substance as listed in 40 CFR 355, Appendices A and B (40 CFR 355.20 and 370.2).
- Title III: Title III of the Superfund Amendments and Reauthorization Act of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 372.3).
- Toxic Chemical: A chemical or chemical category listed in 40 CFR 372.65 (40 CFR 372.3).
- Trade Name Product: A chemical or mixture of chemicals that is distributed to other persons and that incorporates a toxic chemical component that is not identified by the applicable chemical name or Chemical Abstracts Service Registry number listed in 40 CFR 372.65.
- Treatment for Destruction: The destruction of a toxic chemical in waste such that the substance is no longer the toxic chemical subject to reporting under EPCRA section 313. Treatment for destruction does not include the destruction of a toxic chemical in waste where the toxic chemical has a heat value greater than 5,000 Btu and is combusted in any device that is an industrial furnace or boiler (40 CFR 372.3).
- Unlisted Hazardous Substances: A solid waste, as defined in 40 CFR 261.2, which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b), is a hazardous substance under section 101(14) of CERCLA if it exhibits any of the characteristics identified in 40 CFR 261.20 through 261.24 (40 CFR 302.4(b))
- Waste Stabilization: Any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquid as determined by a RCRA approved test method for evaluating solid waste as defined in 40 CFR 372.3. A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are “stabilization,” “waste fixation,” or “waste solidification” (40 CFR 372.3).

Typical Records to Review

- Emergency response plan(s)
- Emergency Release Notification Reports
- Chemical inventory forms
- MSDSs
- Pollution prevention plan (optional)
- Tier I/Tier II reports
- Toxic chemical source reduction and recycling reports (for facilities subject to Form R reporting)
- Toxic release inventory (TRI) reports (Form R/Form A) and related documentation
- Hazardous communication plan
- Contingency plan.

Typical Physical Features to Inspect

- Chemical storage areas
- Chemical manufacturing or processing areas (generation sites)
- Recordkeeping system
- Shop activities
- Hazardous material/waste transfer areas
- Treatment units
- Recycling sites
- Disposal sites
- Surface impoundments

List of Acronyms and Abbreviations

Btu: British Thermal Units
CAA: Clean Air Act
CAS: Chemical Abstract Service
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act (or Superfund)
CFR: Code of Federal Regulations
CWA: Clean Water Act
CY: Calendar Year
EHS: Extremely hazardous substance
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right-to-Know Act of 1986
FR: Federal Register
gal.: Gallon
h: Hour
kg: Kilogram
lb.: Pound
lb/yr: Pounds per year
LEPC: Local Emergency Planning Committee
Mi: Mile

MP: Management practice
MSDS: Material Data Safety Sheet
NOV: Notice of violation
NRC: National Response Center
OSHA: Occupational Health and Safety Act
PAC: Polycyclic aromatic compound
PBT: Persistent bioaccumulative toxic
POTW: Publicly owned treatment works
PPA: Pollution Prevention Act of 1990
RCRA: Resource Conservation and Recovery Act
RQ: Reportable quantity
SARA: Superfund Amendments and Reauthorization Act of 1986
SERC: State Emergency Response Commission
SIC: Standard Industrial Classification
SPCC: Spill Prevention, Control and Countermeasures
TPQ: Threshold planning quantity
TRI: Toxic release inventory
U.S.C.: United States Code
Yr: Year
=/>: Equal to or greater than
=/<: Equal to or less than

Index for Checklist Users

Compliance Category Index			
Refer To:		Refer To:	
Category:	**Checklist Items**	**Category:**	**Checklist Items**
General	EP.1.1 through EP.1.3	Release Notification / Reporting	EP.20.1 through EP.20.6
Planning	EP.10.1 through EP.10.2	Recordkeeping	EP.30.1

Statute Index			
Refer To:		Refer To:	
Category:	**Checklist Items**	**Category:**	**Checklist Items**
EPCRA Section 302	EP.10.1	EPCRA Section 311	EP.20.2
EPCRA Section 304	EP.20.1	EPCRA Section 312	EP.20.3
CERCLA Section 103	EP.20.5	EPCRA Section 313	EP.20.4 and EP.30.1
CERCLA Section 103(f)(2)	EP.20.6		

COMPLIANCE CATEGORY: EPCRA

REGULATORY REQUIREMENT OR MANAGEMENT PRACTICE	**REVIEWER CHECKS**
GENERAL EP.1	
EP.1.1. Current status of ongoing or unresolved Consent Orders, Compliance Agreements, (NOVs), or equivalent state enforcement actions should be examined.	Determine if noncompliance issues have been resolved by reviewing a copy of the previous audit report, Consent Orders, Compliance Agreements, NOVs, or equivalent state enforcement actions. Determine and indicate, for open items, what corrective action is planned and milestones established to correct problems.
EP.1.2. Facilities are required to comply with all applicable regulatory requirements not contained in this checklist.	Determine if any new regulations have been issued since the finalization of this guide. If so, annotate checklist to include new standards. Determine if the facility has activities or facilities that are federally regulated, but not addressed in this checklist. Verify that the facility is in compliance with all applicable and newly issued regulations.
EP.1.3. Facilities are required to abide by state and local regulations concerning hazardous materials.	Verify that the facility is abiding by state and local requirements. Verify that the facility is operating according to permits issued by the state or local agencies. (NOTE: Issues typically regulated by state and local agencies include: • notification requirements • response plan requirements • spill response requirements.)

<table>
<tr><td>PLANNING EP.10</td><td></td></tr>
<tr><td>EP.10.1. Facilities with quantities of extremely hazardous substances equal to or greater than the threshold limitations are required to follow specific emergency planning procedures (40 CFR 355.30 and 355 Appendix A).</td><td>(NOTE: For purposes of this checklist item, an amount of any extremely hazardous substance means the total amount of an extremely hazardous substance present at any one time at a facility at concentrations greater than one percent by weight, regardless of location, number of containers, or method of storage.) Verify that the facility has notified the Commission (see definitions) that it is subject to the emergency planning requirements within 60 days after the facility first becomes subject to these requirements. Verify that the facility has a designated representative who participates in the local emergency planning process as a facility emergency response coordinator. Verify that the facility has notified the local emergency planning committee, or governor if there is no committee, of the facility representative within 30 days after establishment of a local emergency planning committee. Verify that the local emergency planning committee is informed of any changes occurring at the facility that may be relevant to emergency planning. Verify that, upon request of the local emergency planning committee, the facility promptly provides to the committee any information necessary for development or implementation of the local emergency plan. (NOTE: If a container or storage vessel holds a mixture or solution of an extremely hazardous substance, then the concentration of extremely hazardous substance, in weight percent (greater than 1 percent sign), shall be multiplied by the mass (in pounds) in the vessel to determine the actual quantity of extremely hazardous substance therein. Extremely hazardous substances that are solids are subject to either of two threshold planning quantities (i.e., 500/10,000 lb). The lower quantity applies only if the solid exists in powdered form and has a particle size less than 100 microns; or is handled in solution or in molten form; or meets the criteria for a NFPA rating of 2, 3, or 4 for reactivity. If the solid does not meet any of these criteria, it is subject to the upper (10,000 lb) TPQ. The 100-micron level may be determined by multiplying the weight percent of solid with a particle size less than 100 microns in a particular container by the quantity of solid in the container. The amount of solid in solution may be determined by multiplying the weight percent of solid in the solution in a particular container by the quantity of solution in the container. The amount of solid in molten form must be multiplied by 0.3 to determine whether the lower threshold planning quantity is met.)</td></tr>
<tr><td>EP.10.2. The contingency plan developed for the facility should be compared to the local emergency contingency plan (MP).</td><td>Verify that the facility contingency plan is compatible with the contingency plan developed by the local emergency planning committee. Verify that the facility contingency plan considers how local emergency response officials will likely respond to a chemical release.</td></tr>
<tr><td>RELEASE, NOTIFICATION, REPORTING EP.20</td><td>(NOTE: Emergency release notification requirements do not apply to:
any release that results in exposure to persons solely within the boundaries of the facility
any release that is a federally permitted release as defined in section 101 (10) of CERCLA − any release that is continuous and stable in quantity and rate under the definitions in 40 CFR 302.8(b)
any release of a pesticide product exempt from CERCLA section 103(a) reporting under section 103(e) of CERCLA
any release not meeting the definition of release under Section 101(22) of CERCLA, and therefore exempt from Section 103(a) reporting
any radionuclide release which occurs:
naturally in soil from land holdings such as parks, golf courses, or other large tracts of land
naturally from land disturbance activities, including farming, construction, and land disturbance incidental to extraction during mining activities, except that which occurs at uranium, phosphate, tin, zircon, hafnium, vanadium, monazite, and rare earth mines
from the dumping and transportation of coal and coal ash (including fly ash, bottom ash, and boiler slags), including the dumping and land spreading operations that occur during coal ash uses
from piles of coal and coal ash, including fly ash, bottom ash, and boiler slags.</td></tr>
</table>

	(NOTE: Exemption from these emergency release notification requirements for continuous releases does not include exemption from requirements for: • initial notifications as defined in 40 CFR 302.8(d) and (e) • notification of a "statistically significant increase" • notification of a "new release" • notification of a change in the normal range of the release as required under 40 CFR 302.8(g)(2).)
EP.20.1 When there is a release of a reportable quantity (RQ) of any extremely hazardous substance or CERCLA hazardous substance emergency release notification is required (40 CFR 355.40 and 355 Appendices A and B)	Determine if there has been a release of an extremely hazardous substance or CERCLA hazardous substance in excess of the RQ. Verify that, if a release has occurred in excess of the reportable quantity, the following are immediately notified: • community emergency coordinator for LEPC of any area likely to be affected by release • SERC of any state likely to be affected by the release • local emergency response personnel if there is no LEPC Verify that the notice contains the following, to the extent known at the time of notice, so long as no delay in notice or emergency response results: • chemical name or identity of any substance involved in the release • indication of whether the substance is an extremely hazardous substance • estimate of quantity of any such substance released into environment • time and duration of the release • medium or media into which the release occurred • any known or anticipated acute or chronic health risks associated with emergency, and, advice regarding medical attention necessary for exposed individuals • proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordination because of the local emergency plan) • names and telephone numbers of persons to be contacted for further information. Verify that, after the immediate verbal notification, a written follow-up emergency notification is produced which contains the same information detailed in the verbal notice (outlined above), plus: • actions taken to respond to and contain the release • any known or anticipated acute or chronic health risks associated with the release • advice regarding medical attention necessary for exposed individuals.
EP.20.2. Releases in excess of or equal to the RQ of listed and unlisted hazardous substances shall be reported to the NRC immediately (40 CFR 302.5 through 302.6)	Verify that release (other than a federally permitted release or application of a pesticide) of a hazardous substance from a vessel, an offshore facility, or an onshore facility is reported to the NRC immediately after the release is identified. (NOTE: 40 CFR 302.4 lists hazardous substances (see definitions section of this document) and RQs subject to the notification requirements outlined in 40 CFR 302.6. These hazardous substances contained in the tables and Appendix B of 40 CFR 302.4 are referred to in these regulations as "listed hazardous substances". See 40 CFR 302.5(a).) (NOTE: The RQ of unlisted hazardous substance (see definitions) is 100 lb, except for those unlisted hazardous wastes that exhibit extraction procedure (EP) toxicity identified in 40 CFR 261.24. Unlisted hazardous wastes that exhibit EP toxicity have RQs listed in table in 40 CFR 302.4 for contaminant on which characteristic of EP toxicity is based. RQ applies to waste itself, not merely to toxic contaminant. If unlisted hazardous waste exhibits EP toxicity on basis of more than one contaminant, RQ for waste shall be lowest of RQs listed in table in 40 CFR 302.4 for those contaminants. If unlisted hazardous waste exhibits characteristic of EP toxicity and one or more of other characteristics referenced in 40 CFR 302.4(b), RQ for waste is lowest of applicable reportable quantities.)

EP.20.3. Specific notifications are required for releases of hazardous substances that qualify for reduced reporting options (40 CFR 302.8)	Verify, if mixtures or solutions (including hazardous waste streams) of hazardous substances are released, except for radionuclides, release is reported when either of following occur: • quantity of all hazardous constituents of mixture or solution is known and reportable quantity or more of any hazardous constituent is released • quantity of one or more of hazardous constituents of mixture or solution is unknown and total amount of mixture or solution released equals or exceeds reportable quantity for hazardous constituent with lowest reportable quantity. (NOTE: Radionuclides subject to requirements only in following circumstances: • if identity and quantity (in curies) of each radionuclide in released mixture or solution is known, ratio between quantity released (in curies) and RQ for radionuclide must be determined for each radionuclide. Such releases notification requirements are those in which sum of ratios for radionuclides in mixture or solution released is =/> 1 • if identity of each radionuclide in released mixture or solution is known but quantity released (in curies) of one or more of radionuclides is unknown, only releases subject to notification are those in which total quantity (in curies) of mixture or solution released is =/> lowest RQ of any individual radionuclide in mixture or solution • if identity of one or more radionuclides in released mixture or solution is unknown (or if identity of radionuclide released by itself is unknown), only such releases subject to notification requirements are those in which total quantity (in curies) released is equal to or greater than either one curie or lowest RQ of any known individual radionuclide in mixture or solution, whichever is lower.) (NOTE: Following categories of releases are exempt from notification requirements: • releases of those radionuclides that occur naturally in soil from land holdings such as parks, golf courses, or other large tracts of land • releases of naturally occurring radionuclides from land disturbance activities, including farming, construction, and land disturbance incidental to extraction during mining activities, except that which occurs at uranium, phosphate, tin, zircon, hafnium, vanadium, monazite, and rare earth mines. Land disturbance incidental to extraction includes: land clearing; overburden removal and stockpiling; excavating, handling, transporting, and storing ores and other raw materials; and replacing materials in mined-out areas as long as such materials have not been beneficiated or processed and do not contain elevated radionuclide concentrations (greater than 7.6 pCi/g of Uranium-238, 6.8 pCi/g of Thorium-232, or 8.4 pCi/g of Radium-226) • releases of radionuclides from the dumping and transportation of coal and coal ash (including fly ash, bottom ash, and boiler slags), including the dumping and land spreading operations that occur during coal ash uses • releases of radionuclides from piles of coal and coal ash, including fly ash, bottom ash, and boiler slags.) (NOTE: Except for releases of radionuclides, notification of the release of an RQ of solid particles of antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, or zinc is not required if the mean diameter of the particles released is larger than 100 micrometers (0.004 in.). Determine if there are any releases that are continuous and stable in quantity and rate. Verify following notifications have been given: • initial telephone notification • initial written notification within 30 days of the initial telephone notification • follow-up notification within 30 days of first anniversary date of initial written notification • notification of changes in:

EP.20.3. Specific notifications are required for releases of hazardous substances that qualify for reduced reporting options (40 CFR 302.8)	o composition or source of release o information submitted in initial written notification • information submitted in follow-up notification when there is increase in quantity of hazardous substances in any 24-h period represents statistically significant increase. Verify, prior to initial notification of continuous release, person in charge of facility or vessel establishes sound basis for qualifying release for reporting by one of following: • using release data, engineering estimates, knowledge of operating procedures, or best professional judgment to establish the continuity and stability of the release • reporting the release to the NRC for a period sufficient to establish the continuity and stability of the release or when a basis has been established to qualify the release for reduced reporting, initial notification to the NRC is made by telephone. Verify notification is identified as an initial continuous release notification report and includes the following information: • name(s) and location(s) of the facility or vessel • name(s) and identity(ies) of the hazardous substances being released. Verify written notification of continuous release is made to appropriate EPA Regional Office for area where releasing facility is located and occurs within 30 days of initial telephone notification to NRC. Verify initial written notification includes, for each release for which reduced reporting as continuous release is claimed, following information: • name of facility or vessel; location, including latitude and longitude; case number assigned by NRC; Dun and Bradstreet number of facility; port of registration of vessel; name and telephone number of person in charge of facility or vessel • population density within one-mi radius of facility or vessel, described in terms of following ranges: 0-50 persons, 51-100 persons, 101-500 persons, 501-1,000 persons, more than 1,000 persons • identity and location of sensitive populations and ecosystems within one-mi radius of facility or vessel (e.g., schools, hospitals, retirement communities, or wetlands) • for each hazardous substance release claimed to qualify for reporting under CERCLA section 103(f)(2), following information: o name/identity of hazardous substance; CAS Registry Number for substance (if available); and, if the substance being released is a mixture, components of mixture and approximate concentrations and quantities, by weight o upper and lower bounds of normal range of release over previous year o source(s) of release (e.g., valves, pump seals, storage tank vents, stacks). If release is from stack, the stack height (in feet or meters) o frequency of release and fraction of release from each release source and specific period over which it occurs o brief statement describing basis for stating release is continuous and stable in quantity and rate o estimate of total annual amount that was released in the previous year o environmental medium affected by release, such as name of the surface water body; the stream order or average flowrate (in cubic feet/second) and designated use; the surface area (in acres) and average depth (in feet or meters) of the lake; the location of public water supply wells within two mi if on or underground • signed statement hazardous substance release described is continuous and stable in quantity and rate and all reported information is accurate and current to the best knowledge of the person in charge. Verify that, within 30 days of the first anniversary date of the initial written notification (see above), each hazardous substance release reported is evaluated to verify and update the information submitted in the initial written notification.

EP.20.3. Specific notifications are required for releases of hazardous substances that qualify for reduced reporting options (40 CFR 302.8)	Verify follow-up notification contains all information required in initial notification, plus notification of changes in release not otherwise reported (NOTE: Instead of initial written report or follow-up report, copy of TRI form submitted under Section 313 to U.S. EPA for the previous July 1 may be used if the following information is added:
	• population density within 1 mile radius of facility described in terms of following ranges:
	  o 0 to 50 persons
	  o 51 to 100 persons
	  o 101 to 500 persons 501 to 1000 persons
	  o more than 1000 persons
	• identify and location of sensitive populations and ecosystems within a one mile radius of the facility or vessel (e.g., elementary schools, hospitals, retirement communities, or wetlands)
	• following information for each hazardous substance release that qualifies for reporting under CERCLA section 103(f)(2):
	  o upper and lower bounds of the normal range of the release over previous year
	  o frequency of the release and the fraction of the release from each release source and the specific period over which it occurs
	  o brief statement describing the basis for stating that the release is continuous and stable in quantity and rate
	  o signed statement release is continuous and stable in quantity and rate and all information is accurate and current to best knowledge of person in charge.)
	
	(NOTE: If there is change in information submitted in initial written notification or follow-up notification other than change in source, composition, or quantity of release, person in charge of facility or vessel shall provide written notification of change to EPA Region for area where facility or vessel is located, within 30 days of determining information submitted is no longer valid. Notification shall include reason for change, and basis for stating release is continuous and stable under changed conditions. Notification of changes shall include case number assigned by NRC and also signed certification statement.)
	
	Verify notification of statistically significant increase in release is made to NRC as soon as there is knowledge of the release.
	
	(NOTE: Determination of whether increase is “statistically significant increase” shall be made based upon calculations or estimation procedures will identify releases exceed upper bound of reported normal range.)
	
	Verify each hazardous substance release is evaluated annually to determine if changes have occurred in information submitted in initial written notification, follow-up, and/or in previous change notification.
	
	(NOTE: Where necessary to satisfy requirements of 40 CFR 302.8, person in charge may rely on recent release data, engineering estimates, operating history of facility or vessel, or other relevant information to support notification. All supporting documents, materials, and other information shall be kept on file at facility.
	
	Verify supporting materials are kept on file for period of one yr and they substantiate reported normal range of releases, basis for stating release is continuous and stable in quantity and rate, and other information in initial written report, follow-up report, and annual evaluations.

EP.20.3. Specific notifications are required for releases of hazardous substances that qualify for reduced reporting options (40 CFR 302.8)	(NOTE: The supporting materials must be made available to U.S. EPA upon request.) (NOTE: Multiple concurrent releases of same substance occurring at various locations with respect to contiguous plants or installations upon contiguous grounds under common ownership or control may be considered separately or added together in determining whether such releases constitute continuous release or a statistical increase in release; whichever approach is elected for purposes of determining whether release is continuous also must be used to determine statistically significant increase in release.)
EP.20.4. Facilities which are required to prepare or have available a MSDS for a hazardous chemical under OSHA are required to meet specific MSDS reporting requirements for planning purposes (40 CFR 370.20(a) through 370.21(a), 370.20(c), and 370.28).	(NOTE: The emergency response commission consists of SERC and LEPC. Some states have only one of these.) Verify MSDSs (or list as described below) are submitted to SERC, LEPC, and fire department with jurisdiction over facility for each hazardous chemical present according to following thresholds: • for all EHSs present in amounts greater than or equal to 500 lb (227 kg, approximately 55 gal) or threshold planning quantity, whichever is lower • for gasoline (all grades combined) in amounts >= to 75,000 gal when gasoline is in tanks entirely underground at retail gas station that was in compliance during the preceding calendar year with all applicable UST regulations (40 CFR Part 280 or requirements of the state UST program approved by U.S. EPA under 40 CFR Part 281) • for diesel fuel (all grades combined) in amounts >= to 100,000 gal when the diesel is in tanks entirely underground at a retail gas station that was in compliance during the preceding calendar year with all applicable UST regulations (40 CFR Part 280 or requirements of the state UST program approved by U.S. EPA under 40 CFR Part 281) • for all other hazardous chemicals present at any one time in amounts equal to or greater than 10,000 lb (4540 kg). (NOTE: For purposes of these threshold values, retail gas station is retail facility engaged in selling gasoline and/or diesel fuel principally to public, for motor vehicle use on land.) (NOTE: Commonly overlooked substances requiring MSDS are propane and petroleum based fuels. For diesel and unleaded gasoline, 10,000 lb equals approximately 1,379 gal using the weight of 7.25 lb/gal.) Verify if facility has not submitted MSDSs, the following have been submitted: • list of hazardous chemicals for which the MSDS is required, grouped by hazard category (see Key Terms and Definitions section for a definition of Hazard Category) • chemical or common name of each hazardous chemical as provided on the MSDS • any hazardous component of each hazardous chemical as provided on the MSDS unless reported as a mixture (see 40 CFR 370.28(a)(2). Verify revised MSDSs are provided to local emergency planning committee, emergency response commission, and fire department within 3 mo after discovery of significant new information concerning the hazardous chemical for which the MSDSs were submitted. NOTE: When MSDSs for hazardous chemicals present at the facility have not been submitted to the local emergency planning committee, the facility owner or operator must submit the MSDSs within 30 days of the receipt of such a request.)

EP.20.4. Facilities which are required to prepare or have available MSDS for a hazardous chemical under OSHA required to meet specific MSDS reporting requirements for planning purposes	(NOTE: These reporting requirements for hazardous chemical that is mixture of hazardous chemicals can be fulfilled by doing one of following: − providing required information on each component in the mixture that is a hazardous chemical − providing the required information on the mixture itself so long as the reporting of a mixture by a facility is in the same manner as required by 40 CFR 370.21 where practicable.)
EP.20.5. Facilities which are required to prepare or have available a MSDS for a hazardous chemical under OSHA are required to meet specific inventory reporting requirements for planning purposes (40 CFR 370.20(a), 370.20(b), 370.20(d), 370.25, and 370.28(a)).	Verify Tier I (or Tier II) Hazardous Chemical Inventory forms are submitted annually to the LEPC, SERC, and the fire department with jurisdiction over the facility. (NOTE: Hazardous chemicals and substances included Hazardous Chemical Inventory forms are: • all EHSs present in amounts greater than or equal to 500 lb (227 kg, approximately 55 gal) or the threshold planning quantity, whichever is lower • gasoline (all grades combined) in amounts greater than or equal to 75,000 gal (or approximately 283,900 L) when the gasoline is in tanks entirely underground at a retail gas station that was in compliance during the preceding calendar year with all applicable UST regulations (40 CFR Part 280 or requirements of the state UST program approved by U.S. EPA under 40 CFR Part 281) • diesel fuel (all grades combined) in amounts greater than or equal to 100,000 gal (or approximately 378,500 L) when the diesel is in tanks entirely underground at a retail gas station that was in compliance during the preceding calendar year with all applicable UST regulations (40 CFR Part 280 or requirements of the state UST program approved by U.S. EPA under 40 CFR Part 281) • all other hazardous chemicals present at any one time in amounts >= 10,000 lb Verify Tier I or Tier II forms are submitted on or before March 1 of the first year after the facility becomes subject to 40 CFR 370.20 through 370.28. (NOTE: For purposes of these threshold values, retail gas station is retail facility engaged in selling gasoline and/or diesel fuel principally to public, for motor vehicle use on land.) (NOTE: Commonly overlooked substances requiring an MSDS are propane and petroleum based fuels.) (NOTE: A Tier II form may be submitted in lieu of the Tier I information with respect to any hazardous chemical at the facility. If requested, all Tier II forms must be submitted to the local emergency planning committee, the emergency response commission and the fire department with jurisdiction over the facility. Tier II forms must be submitted within 30 days of the receipt of each request.) (NOTE: The owner or operator of a facility that has submitted a Tier I or Tier II inventory form must allow on-site inspection by the fire department having jurisdiction over the facility upon request of the department and provide to the department specific location information on hazardous chemicals at the facility.) (NOTE: These reporting requirements for a hazardous chemical that is a mixture of hazardous chemicals may be fulfilled by doing one of the following: • providing the required information on each component in the mixture that is a hazardous chemical • providing the required information on the mixture itself so long as the reporting of mixtures by a facility is in the same manner as required by 40 CFR 370.21 where practicable.)

EP.20.6. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain reporting requirements (40 CFR 372.22 through 372.38 and 372.95(b)).	(NOTE: These reporting requirements apply to facilities that meet all of the following criteria for a calendar year: • facility has 10 or more full-time employees • facility is in SIC (as in effect on January 1, 1987) major group codes 10 (except 1011, 1081, and 1094), 12 (except 1241), or 20 through 39; industry codes 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce); or 4953 (limited to facilities regulated under the RCRA, subtitle C, 42 U.S.C. section 6921 et seq.), or 5169, or 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis) by virtue of the fact that it meets one of the following criteria: o facility is establishment with SIC major group or industry code in above list o facility is a multi-establishment complex where all establishments have primary SIC major group or industry codes in the above list o facility is a multi-establishment complex in which one of the following is true: o sum of value of services provided and/or products shipped and/or produced from those establishments have primary SIC major group or industry codes in above list is > 50 percent of total value of all services provided and/or products shipped from and/or produced by all establishments at facility o one establishment having primary SIC major group or industry code in above list contributes more in terms of value of services provided and/or products shipped from and/or produced at facility than any other establishment within the facility. • facility manufactured (including imported), processed, or otherwise used a listed toxic chemical in excess of an applicable threshold quantity of that chemical.) (NOTE: The following are the threshold levels for a facility that is manufacturing (including importing), processing, or otherwise using a toxic chemical: • manufactured or processed over 25,000 lb/yr of toxic chemicals, except for persistent bioaccumulative toxic (PBT) chemicals • otherwise used over 10,000 lb of toxic chemicals during year, except for PBT chemicals • chemicals listed in Appendix A of this document, amounts indicated in appendix. (NOTE: Reporting requirement thresholds for PBY chemicals are listed in Table 2 of Appendix A of this document.) Verify completed U.S. EPA Form R (U.S. EPA Form 9350-1) is submitted annually, for each toxic chemical known by facility owner or operator to be manufactured (including imported) or otherwise used and exceeding threshold levels in one calendar year to U.S. EPA and state on or before July 1 of the next year. (NOTE: Articles containing toxic chemicals are not included in calculations of total toxic chemical present. See 40 CFR 372.38(b) to determine whether an excess has occurred.) (NOTE: Facility regulated under 40 CFR Part 372 is required to complete and submit Form R, as described above, for toxic chemical present as component of mixture or trade name product which owner or operator receives from another person, if chemical is imported, processed, or otherwise used by owner or operator in excess of applicable threshold quantity at facility as part of mixture or trade name product.) (NOTE: Owner or operator of facility at which toxic chemical was manufactured (including imported), processed or otherwise used in excess of applicable threshold quantity may submit separate Form R for each establishment or for each group of establishments within facility to report activities involving toxic chemical at each establishment or group of establishments, provided activities involving toxic chemical at all establishments within covered facility are reported. See 40 CFR 372.30(c) for instruction and procedures regarding alternatives for reporting when facility consists of more than 1 establishment.

EP.20.6. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain reporting requirements (40 CFR 372.22 through 372.38 and 372.95(b)).	(NOTE: Facility may apply alternate threshold of one million lb/yr to chemical if it is calculated facility would have annual reportable amount of that toxic chemical not exceeding 500 lb for combined total quantities released at facility, disposed within facility, treated at facility (as represented by amounts destroyed or converted by treatment processes), recovered at facility as result of recycle operations, combusted for purpose of energy recovery at facility, and amounts transferred from facility to offsite locations for purpose of recycle, energy recovery, treatment, and/or disposal. Alternate threshold provisions do not apply to chemicals listed in Appendix A of this document.) Verify, if a facility uses alternate reporting threshold, facility owner or operator submits the required certification statement that contains the following information instead of the U.S. EPA Form R: • reporting year • an indication of whether the chemical identified is being claimed as trade secret • chemical name and CAS number (if applicable) of the chemical, or the category name • signature of senior management official certifying following: pursuant to 40 CFR 372.27, "I hereby certify that to the best of my knowledge and belief for the toxic chemical listed in this statement, the annual reportable amount, as defined in 40 CFR 372.27(a), did not exceed 500 lb for this reporting year and that the chemical was manufactured, or processed, or otherwise used in an amount not exceeding 1 million pounds during this reporting year" • date signed • facility name and address • mailing address of the facility if different than the above • toxic chemical release inventory facility identification number if known • name and telephone number of a technical contact • the four-digit SIC codes for the facility or establishments in the facility • latitude and longitude coordinates for the facility • Dun and Bradstreet number of the facility • U.S. EPA identification number(s) (RCRA) I.D. Number(s) of the facility • facility NPDES permit number(s) • underground Injection Well Code (UIC) I.D. Number(s) of the facility • name of the facility's parent company • parent company's Dun and Bradstreet Number. Verify that, when more than one threshold applies to facility activities, the facility owner or operator reports if it exceeds any applicable threshold and reports on all activities at the facility involving the chemical unless otherwise exempted (see below). Verify that, when a facility manufactures, processes, or otherwise uses more than one member of a chemical category listed in 40 CFR 372.65(c), the facility owner or operator reports if it exceeds any applicable threshold for the total volume of all the members of the category involved in the applicable activity and the report covers all activities at the facility involving members of the category. (NOTE: A facility may process or otherwise use a toxic chemical in a recycle/reuse operation. To determine whether the facility has processed or used more than an applicable threshold of the chemical, the owner or operator of the facility counts the amount of the chemical added to the recycle/reuse operation during the calendar year. In particular, if the facility starts up such an operation during a calendar year, or in the event that the contents of the whole recycle/reuse operation are replaced in a calendar year, the facility owner or operator also counts the amount of the chemical placed into the system at these times.) (NOTE: Certain toxic chemicals, manufacturing methods used to produce these chemicals and/or the physical forms or colors of these chemical may limit reporting requirements under 40 CFR Part 372. These specific circumstances and conditions and reporting requirements are outlined in 40 CFR 372.25(f) through (h).)

EP.20.6. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain reporting requirements (40 CFR 372.22 through 372.38 and 372.95(b)).	(NOTE: The following exemptions apply: • if a toxic chemical is present in a mixture of chemicals at a covered facility and the toxic chemical is in a concentration in the mixture which is below one percent of the mixture, or 0.1 percent of the mixture in the case of a toxic chemical which is a carcinogen as defined in 29 CFR 1910.1200(d)(4), the quantity of the toxic chemical present in such mixture does not have to be considered when determining whether an applicable threshold has been met or determining the amount of release to be reported under 40 CFR 372.30. This exemption applies whether the person received the mixture from another person or the person produced the mixture, either by mixing the chemicals involved or by causing a chemical reaction that resulted in the creation of the toxic chemical in the mixture. However, this exemption applies only to the quantity of the toxic chemical present in the mixture. If the toxic chemical is also manufactured (including imported), processed, or otherwise used at the covered facility other than as part of the mixture or in a mixture at higher concentrations, in excess of an applicable threshold quantity, the facility is required to report. This exemption does not apply to the chemicals listed in Appendix A of this document • if a toxic chemical is present in an article at a covered facility, the quantity of the toxic chemical present in such article does not have to be considered when determining whether an applicable threshold has been met or determining the amount of release to be reported. This exemption applies whether the person received the article from another person or produced the article. However, this exemption applies only to the quantity of the toxic chemical present in the article. If the toxic chemical is manufactured (including imported), processed, or otherwise used at the covered facility other than as part of the article, in excess of an applicable threshold quantity, reporting is required. If a release of a toxic chemical occurs as a result of the processing or use of an item at the facility, that item does not meet the definition of article. • if a toxic chemical is used at a covered facility for one of the following purposes, it is not required to consider the quantity of the toxic chemical used for such purpose when determining whether an applicable threshold has been met under 40 CFR 372.25 or determining the amount of releases to be reported. However, this exemption only applies to the quantity of the toxic chemical used for the purpose described in the following list. If the toxic chemical is also manufactured (including imported), processed, or otherwise used at the covered facility other than as listed below, in excess of an applicable threshold quantity, reporting is required. The list includes: • use as a structural component of the facility • use of products for routine janitorial or facility grounds maintenance • personal use by employees or other persons at the facility of foods, drugs, cosmetics, or other personal items containing toxic chemicals, including supplies of such products within the facility such as in a facility operated cafeteria, store, or infirmary • use of products containing toxic chemicals for the purpose of maintaining motor vehicles operated by the facility – use of toxic chemicals present in process water and non-contact cooling water as drawn from the environment or from municipal sources • toxic chemicals present in air used either as compressed air or as part of combustion. • if a toxic chemical is manufactured, processed, or used in a laboratory at a covered facility under the supervision of a technically qualified individual, it is not required to consider the quantity so manufactured, processed, or used when determining whether an applicable threshold has been met or determining the amount of release to be reported (NOTE: This exemption does not apply in the following cases: specialty chemical production; manufacture, processing, or use of toxic chemicals in pilot plant scale operations; activities conducted outside the laboratory). (NOTE: Other exemptions may also apply to certain owners of leased property, certain operators of establishments on leased property, and owners and operators of facilities engaged in coal extraction activities, or metal mining overburden activities. See 40 CFR 372.38(e) through (h) for further detail regarding these types of exemptions.)

RECORDKEEPING EP.30	

EP.30.1. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain recordkeeping requirements (40 CFR 372.22(a), 372.22(b), 372.22(c, 372.25(a), 372.25(b), 372.10(a) through 372.10(d), and 372.38).	(NOTE: These requirements apply to facilities that meet all of following criteria for calendar year:
	• facility has 10 or more full-time employees
	• facility is in SIC (as in effect on January 1, 1987) major group codes 10 (except 1011, 1081, and 1094), 12 (except 1241), or 20 through 39; industry codes 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce); or 4953 (limited to facilities regulated under RCRA, subtitle C, 42 U.S.C. section 6921 et seq.), or 5169, or 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis) by virtue of the fact that it meets one of following criteria:
	  o facility is establishment with a primary SIC major group or industry code in above list
	  o facility is a multi-establishment complex where all establishments have primary SIC major group or industry codes in the above list
	  o facility is a multi-establishment complex in which one of the following is true:
	    • sum of value of services provided and/or products shipped and/or produced from those establishments have primary SIC major group or industry codes in above list is > 50% of total value of all services provided and/or products shipped from and/or produced by all establishments at the facility
	    • one establishment having a primary SIC major group or industry code in above list contributes more in terms of value of services provided and/or products shipped from and/or produced at facility than any other establishment within the facility.
	• facility manufactured (including imported), processed, or otherwise used a toxic chemical in excess of an applicable threshold quantity of that chemical.)
	
	(NOTE: Following are threshold levels for reporting purposes that apply to facility that is manufacturing (including importing), processing, or otherwise using a toxic chemical:
	• has manufactured or processed 25,000 lb/yr of toxic chemicals
	• has used 10,000 lb of toxic chemicals in other ways during the year
	• for the chemicals listed in Appendix A of this document, the amounts indicated in the appendix.
	
	(NOTE: Articles containing toxic chemicals are not included in calculations of total toxic chemical present. See 40 CFR 372.30(b)(3) for procedure to determine whether an excess has occurred.)
	
	Verify following records are kept 3 yr from date of submission of Form R (U.S. EPA Form 9350-1):
	• a copy of each Form R report submitted
	• all supporting materials and documentation used by person to make compliance determination that the facility or establishments is a covered facility under 40 CFR 372.22 or 372.45
	• documentation supporting the submitted report, including:
	  o supporting any determination that a claimed allowable exemption under 40 CFR 372.38 applies
	  o determination of whether reporting threshold applies for each toxic chemical
	  o supporting the calculations of the quantity of each toxic chemical released to the environment or transferred to an off-site location
	  o supporting the use indications and quantity onsite reporting for each toxic chemical, including dates of manufacturing, processing, or use
	  o supporting basis of estimate used in developing any release or off-site transfer estimates for each toxic chemical
	  o receipts or manifests associated with the transfer of each toxic chemical in waste to off-site locations
	  o reported waste treatment methods, estimates of treatment efficiencies, ranges of influent concentration to such treatment, sequential nature of treatment steps, if applicable, and actual operating data, if applicable, to support waste treatment efficiency estimate for each toxic chemical.

EP.30.1. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain recordkeeping requirements (40 CFR 372.22(a), 372.22(b), 372.22(c, 372.25(a), 372.25(b), 372.10(a) through 372.10(d), and 372.38).	Verify that the following records are maintained for 3 yr at the facility to which the report applies or from which supplier notification was provided: • all supporting materials and documentation used to determine if supplier notification is required • all supporting materials and documentation used in developing each required supplier notification and a copy of each notification. (NOTE: Records retained under this section must be maintained at the facility to which the report applies or from which a notification was provided. Such records must be readily available for purposes of inspection by U.S. EPA.) Verify that, if it has been determined the alternate threshold (see 40 CFR 372.27 may be applied, the following records are kept for 3 yr from the date of submission of the required certification statement: • a copy of each certification statement submitted • all supporting materials and documentation used to make compliance determination facility or establishment is eligible to apply the alternate threshold • documentation supporting the certification statement submitted, including: o data supporting the determination of whether the alternate threshold applies for each toxic chemical o documentation supporting the calculation of annual reportable amount (see 40 CFR 372.37(a)), for each toxic chemical, including documentation supporting the calculations and the calculations of each data element combined for the annual reportable amount o receipts or manifests associated with the transfer of each chemical in waste to off-site locations.
EP.30.1. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain recordkeeping requirements (40 CFR 372.22(a), 372.22(b), 372.22(c, 372.25(a), 372.25(b), 372.10(a) through 372.10(d), and 372.38).	(NOTE: Following exemptions apply: • if toxic chemical is present in mixture of chemicals at covered facility and toxic chemical is in concentration in mixture which is <1% of mixture, or 0.1 percent of mixture in case of toxic chemical which is carcinogen as defined in 29 CFR 1910.1200(d)(4), quantity of toxic chemical present in such mixture does not have to be considered when determining whether applicable threshold has been met or determining amount of release to be reported under 40 CFR 372.30. Exemption applies whether person received mixture from another person or person produced mixture, either by mixing chemicals involved or by causing chemical reaction that resulted in creation of toxic chemical in mixture. However, exemption applies only to quantity of toxic chemical present in mixture. If toxic chemical is also manufactured (including imported), processed, or otherwise used at covered facility other than as part of mixture or in mixture at higher concentrations, in excess of an applicable threshold quantity, the facility is required to report. This exemption does not apply to the chemicals listed in Appendix A of this document • if toxic chemical is present in article at covered facility, quantity of toxic chemical present in such article does not have to be considered when determining whether applicable threshold has been met or determining amount of release to be reported. Exemption applies whether person received article from another person or produced article. However, exemption applies only to quantity of toxic chemical present in article. If toxic chemical is manufactured (including imported), processed, or otherwise used at the covered facility other than as part of the article, in excess of an applicable threshold quantity, reporting is required. If a release of a toxic chemical occurs as a result of the processing or use of an item at the facility, that item does not meet the definition of article. • if a toxic chemical is used at a covered facility for one of the following purposes, it is not required to consider the quantity of the toxic chemical used for such purpose when determining whether an applicable threshold has been met under 40 CFR 372.25 or determining the amount of releases to be reported. However, this exemption only applies to the quantity of the toxic chemical used for the purpose described in the following list. If the toxic chemical is also manufactured (including imported), processed, or otherwise used at the covered facility other than as listed below, in excess of an applicable threshold quantity, reporting is required. The list includes:

EP.30.1. Facilities that manufacture, process, or otherwise use a listed toxic chemical in excess of applicable threshold quantities and that have 10 or more employees are subject to certain recordkeeping requirements (40 CFR 372.22(a), 372.22(b), 372.22(c, 372.25(a), 372.25(b), 372.10(a) through 372.10(d), and 372.38).	o use as a structural component of the facility o use of products for routine janitorial or facility grounds maintenance o personal use by employees or other persons at the facility of foods, drugs, cosmetics, or other personal items containing toxic chemicals, including supplies of such products within the facility such as in a facility operated cafeteria, store, or infirmary o use of products containing toxic chemicals for the purpose of maintaining motor vehicles operated by the facility o use of toxic chemicals present in process water and non-contact cooling water as drawn from the environment or from municipal sources o toxic chemicals present in air used either as compressed air or as part of combustion. • if a toxic chemical is manufactured, processed, or used in a laboratory at a covered facility under the supervision of a technically qualified individual, it is not required to consider the quantity so manufactured, processed, or used when determining whether an applicable threshold has been met or determining the amount of release to be reported (NOTE: This exemption does not apply in the following cases: specialty chemical production; manufacture, processing, or use of toxic chemicals in pilot plant scale operations; activities conducted outside the laboratory). (NOTE: Other exemptions may also apply to certain owners of leased property, certain operators of establishments on leased property, and owners and operators of facilities engaged in coal extraction activities, or metal mining overburden activities. See 40 CFR 372.38 (e) through (h) for further detail regarding these types of exemptions.)

CLEAN AIR ACT SECTION 112(R): Accidental Release Prevention/Risk Management Plan Rule

HOME

When Congress passed the Clean Air Act Amendments of 1990, Section 112r required EPA to publish regulations and guidance for chemical accident prevention at facilities using substances that posed the greatest risk of harm from accidental releases.

These regulations were built upon existing industry codes and standards (available at: www.epa.gov/emergencies/lawsregs.htm#fraccident) and require companies of all sizes that use certain listed regulated flammable and toxic substances to develop a Risk Management Program, which includes a(n):

- Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases scenarios;
- Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and
- Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g., the fire department) should an accident occur.

By June 21, 1999, a summary of the facility's risk management program (known as a "Risk Management Plan" or "RMP") was to be submitted to EPA. At the end of 2008, EPA had RMPs from about 14,000 facilities.

The plans must be revised and resubmitted every five years.

There are other circumstances described in the RMP regulations, however, which may require a more frequent submission.

New facilities must submit a completed RMP as soon as they have a covered chemical above the threshold quantity.

The Risk Management Program is about reducing chemical risk at the local level.

The RMP information helps local fire, police, and emergency response personnel (who must prepare for and respond to chemical accidents), and is useful to citizens in understanding the chemical hazards in communities.

WHO IS COVERED BY THE RMP REGULATIONS?

Owners and operators of a facility (stationary source) that manufactures, uses, stores, or otherwise handles more than a threshold quantity of a listed regulated substance in a process, must implement a risk management program and submit a single RMP for all covered processes at the facility.

“Process” means any activity involving a listed regulated substance, including any use, storage, manufacturing, handling, or onsite movement of such substances, or combination of these activities.

The regulations do not apply to transportation, including storage incident to transportation.

However, transportation containers used for storage not incident to transportation and transportation containers connected to equipment at a stationary source are considered part of the stationary source, and are potentially covered by the regulations.

See the General Guidance on Risk Management Program for Chemical Accident Prevention (40 CFR Part 68) at: http://www.epa.gov/emergencies/docs/chem/Tocfinal.pdf for more information on regulatory coverage.

WHAT CHEMICALS ARE COVERED?

The regulation includes a List of Regulated Substances under section 112(r) of the Clean Air Act, including their synonyms and threshold quantities (in pounds) to help assess if a process is subject to the Part 68 rule or the general duty clause.

A link to EPA’s list of regulated substances and their threshold quantities can be found at: http://www.epa.gov/emergencies/content/rmp/index.htm.

The regulated substances are listed in four tables, two listing the regulated toxic substances (alphabetically and by CAS number) and two listing the regulated flammable substances (alphabetically and by CAS number).

States who have taken delegation of the Clean Air Act, Section 112(r) program may have additional requirements for the federally listed chemicals, and/or additional listed chemicals.

(NOTE: Listed flammable substances used as fuel or held for sale as fuel at a retail facility are not covered by the Part 68 regulations.

However, flammable substances used for some other purpose, such as a chemical feedstock or when held for sale as fuel at a wholesale facility are covered by the regulations.)

The threshold quantities for toxics range from 500 to 20,000 pounds. For all listed flammables, the threshold quantity is 10,000 pounds.

WHAT ARE “PROGRAM LEVELS”?

An underlying principle of the regulations is that “one size does not fit all.” EPA has classified processes into three Programs to ensure that individual processes are subject to requirements that appropriately match their size and the risks they pose. As a result, different facilities covered by the regulations may have different requirements depending on their processes.

Program Level 1 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes that would not affect the public in the situation of a worst-case release (in the language of Part 68, processes "with no public receptors within the distance to an endpoint from a worst-case release") and with no accidents with specific offsite consequences within the past five years.

Program 1 imposes limited hazard assessment requirements and minimal accident prevention and emergency response requirements.

Program Level 2 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes not eligible for Program 1 or subject to Program 3.

Program 2 imposes streamlined accident prevention program requirements, as well as additional hazard assessment, management, and emergency response requirements.

Program Level 3 (http://www.epa.gov/emergencies/docs/chem/Chap-02-final.pdf) applies to processes not eligible for Program 1 and either subject to OSHA's Process Safety Management (PSM) standard under federal or state OSHA programs or classified in one of ten specified North American Industrial Classification System (NAICS) codes.

Program 3 imposes OSHA's PSM standard as the accident prevention program as well as additional hazard assessment, management, and emergency response requirements.

Based on their limited potential for serious offsite consequences, facilities are not required to implement a prevention program, an emergency response program, or a management system for Program 1 processes.

Facilities with processes in Program 2 and Program 3 must address each of the three RMP elements described above for those processes.

For more detailed information, consult the General Guidance on Risk Management Programs for Chemical Accident Prevention (40 CFR Part 68) or one of the industry-specific guidance documents available at: www.epa.gov/emergencies/guidance.htm for an explanation of what is involved for each of the RMP elements.

WHERE DO YOU GO FOR MORE INFORMATION?

Visit the Risk Management Program Web site at: http://www.epa.gov/emergencies/rmp for current information and sign up for the listserv to receive periodic updates.

EPA 550-F-98-004, April, 1998

BASIC AWARENESS FACTSHEET FOR SMALL BUSINESS: Clean Air Act Section 112(r): Prevention of Accidental Releases

HOME

This factsheet was developed with the assistance of the U.S. Chamber of Commerce and the New Hampshire Small Business Assistance Program.

Chemical accidents can occur at businesses of any size. Many small businesses handle propane, ammonia, chlorine, and other chemicals that could pose a risk to the surrounding community if an accident were to occur.

Working together through their trade associations, some industries already have adopted standard operating practices that help to reduce the risk of accidents, improve overall performance, and limit costly downtime. As of June 1999, a new chemical accident prevention rule from the U.S. EPA will extend such programs to many small businesses that use hazardous chemicals. This regulation requires companies of all sizes that use certain chemicals to develop a "risk management program," a regular program of activities designed to prevent an accidental chemical release from occurring. Many of these activities (such as training employees and inspecting and maintaining your equipment) are essential to any successful business. Other activities, such as evaluating the dangers associated with your operations and determining how to make them safer, are things that you think about on a regular basis. To comply, you will need to develop a risk management program and then prepare and submit a written summary of your program (a RMP). Your plan will be submitted to a central location and made available through the internet to state and local officials involved in planning for and responding to chemical emergencies, and to the public. In this way, people who live near your business, and police and firefighters who protect them, will learn more about the hazards of the chemicals you use and the steps you are taking to prevent accidents.

Am I Covered?

The type and quantity of chemicals that you use will determine whether you must report, not the size of your company. The toxic and flammable chemicals ("regulated substances") covered by this new regulation include materials that many small businesses commonly use and store. If you handle, use, or store any of these substance above a certain quantity, you will be required to develop a risk management program. For example:

If you have...	in excess of...
Propane	10,000 lbs. (2,500-gal water capacity tank)
Chlorine	2,500 pounds
Ammonia	10,000 pounds (anhydrous)

then you may be subject to these requirements. If you have other chemicals, don't assume that you will not be covered you can compare these with the complete list of regulated substances available from EPA's Hotline (see below). This rule will apply to many propane retailers and users, cold storage warehouses, water treatment systems, food processors, chemical and metal products manufacturers, chemical wholesalers, and agricultural chemical retailers.

What's Next?

Facilities must have their risk management program in place and a risk management plan submitted by June 20, 1999. The regulation requires that your plan be submitted to a central repository managed by U.S. EPA . To assist you:

1) EPA has worked with trade associations and other industry groups to develop a series of industry-specific guidances that will help walk businesses through creating their risk management program. Examples of businesses that can obtain these guidances are chemical warehouses, water treatment facilities, propane retailers and users, chemical distributors, and ammonia refrigeration systems.
2) EPA is developing a computer diskette to allow companies to submit their risk management plans electronically. (Small businesses that are unable to do so may be eligible for a waiver so they can submit their plans on paper.)

Once your RMP is submitted, it will be reviewed for accuracy and completeness. A visit may also be conducted at your facility by either EPA, state, or local officials to determine whether your plan accurately reflects your risk management program in operation.

Key Dates

- Industry-specific guidances available starting Summer 1998
- Computer diskette available January 4,
- 1999 Risk management plans accepted beginning January 1999
- Risk management plans/programs due

What Do I Have to Do?

If you are covered, EPA encourages you to contact the Emergency Planning and RMP Hotline (see below) to determine what requirements apply to your operations. The rule requires covered facilities to develop and implement safe business practices to identify hazards and manage risks. You must analyze worst-case releases, document a five-year history of serious accidents, coordinate with local emergency responders, and file a RMP with EPA.

If an accidental chemical release could affect the public, you must also analyze more realistic scenarios and develop and implement a prevention program that includes identification of hazards, written operating procedures, training, maintenance, and accident investigation. If your employees respond to accidental releases, you also must implement an emergency response program.

Good News: You Already Do Some of This!

The good news is that many small businesses are already complying with many of these requirements because they are part of the way you operate safely. The following is a list of programs and activities that you may be required to do, but will not have to duplicate if you are doing them as part of your normal operations:

- Employee training on operating procedures for equipment,
- Employee training on Material Safety Data Sheets to comply with the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard,
- Maintenance and inspection of your equipment and processes, and
- Documentation of your equipment specifications.

In addition, if you are already subject to the OSHA Process Safety Management Standard, you are likely to be in compliance with almost all of the prevention program requirements in this new rule. Finally, if you already have an emergency response plan, you are also likely to be in compliance with that part of EPA's rule.

Why Am I Required To Do This?

The Risk Management Program rule is intended to prevent serious chemical accidents that could affect public health and the environment and improve the response to accidents that do occur. This new regulation builds upon the Emergency Planning and Community Right-to-Know Act (also known as SARA Title III), which requires facilities to submit chemical inventory information to state and local governments to help community officials plan for and to chemical accidents

This program is also an extension of successful federal and industry standards that established practices for preventing hazardous chemical incidents. Facilities that voluntarily adopted industry standards for accident prevention or have complied with related federal and state programs have found that the benefits outweigh the initial costs through:

- Improved operating performance due to better training and safer operations;
- Avoidance of serious accidents involving evacuation, injury, and even death;
- Better community and employee relations;
- Fewer chemical accidents; and
- Reduction in downtime caused by equipment malfunctions.

Complying with the Risk Management Program requirements will put you on the road toward these important benefits. In addition, your risk management plan will help your local fire, police, and emergency medical personnel (who must prepare for and respond to chemical accidents) and will be useful to the public in understanding the chemical hazards in your community. The availability of your risk management plan is intended to stimulate communication between industry and the public to improve accident prevention and emergency response practices at the local level.

THE GENERAL DUTY CLAUSE

HOME

Under the Clean Air Act Section 112(r)(1), the General Duty Clause states:

"The owners and operators of stationary sources producing, processing, handling or storing such substances [i.e., a chemical in 40 CFR part 68 or any other extremely hazardous substance] have a general duty [in the same manner and to the same extent as the general duty clause in the Occupational Safety and Health Act (OSHA)] to identify hazards which may result from (such) releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."

WHAT IS THE GENERAL DUTY CLAUSE?

In the Clean Air Act Amendments of 1990, Congress enacted Section 112(r)(1), also known as the General Duty Clause (GDC), which makes the owners and operators of facilities that have regulated and other extremely hazardous substances responsible for ensuring that their chemicals are managed safely.

Facilities have been required to comply with GDC since November 1990.

WHO IS COVERED?

The General Duty Clause applies to any stationary source producing, processing, handling, or storing regulated substances or other extremely hazardous substances.

"Other extremely hazardous substances" are any chemicals listed in 40 CFR part 68, or any other chemicals, which may be considered extremely hazardous.

WHAT DOES THE GENERAL DUTY CLAUSE INVOLVE?

Facilities subject to the General Duty Clause are, among other things, responsible for the following:

- Knowing the hazards posed by the chemicals and assessing the impacts of possible releases,
- Designing and maintaining a safe facility to prevent accidental releases, and
- Minimizing the consequences of accidental releases that do occur.

WHAT IS THE CHEMICAL ACCIDENT PREVENTION PROGRAM?

Clean Air Act Section 112(r) also established the Chemical Accident Prevention Program dedicated to recognizing hazards and preventing accidents.

It differs from the GDC in that it requires facilities that use listed toxic or flammable chemicals above certain thresholds to implement a specified set of accident prevention and emergency response program elements, and to submit a document called a risk management plan (RMP) to EPA.

The RMP summarizes a regulated facility's hazard assessment, emergency response program, and accident prevention program information. Most of the information in a facility's RMP is also available to the public.

HOW DO I MEET MY GDC OBLIGATIONS?

It is important to understand that the General Duty Clause is not a regulation and compliance cannot be checked against a regulation or submission of data.

The General Duty Clause requires you to identify hazards your facility may present from accidental releases of hazardous substances, design and maintain a safe facility, and minimize the consequences of accidental releases which do occur. Generally, among other things, you should:

1) Adopt or follow any relevant industry codes, practices or consensus standards (for the process or facility as a whole as well as for particular chemicals or pieces of equipment),
2) Be aware of unique circumstances of your facility which may require a tailored accident prevention program, and
3) Be aware of accidents and other incidents in your industry that indicate potential hazards.

Examples

- A facility installed a water-based fire suppression system in storage areas that contained water-reactive chemicals. This created a clearly hazardous condition. The General Duty Clause required the facility to install a fire suppression system that was compatible with water reactive chemicals.
- Preventing and mitigating accidental releases related to known equipment failure scenarios is a GDC obligation.

Answers to Your Questions

I don't have to submit an RMP because I lowered my thresholds – and I believe that I lowered my risk. Am I still subject to the General Duty Clause?

- Yes. If you use a regulated substance or any other extremely hazardous substance in any amount you are subject to the GDC.

How can I find out what GDC inspectors are looking for at my facility?

- Read the Guidance for Implementation of the General Duty Clause Clean Air Act Section 112(r)(1) at: http://www.epa.gov/oem/docs/chem/gdcregionalguidance.pdf.

How can I find out about accidents and recognized hazards in my industry sector?

- Your trade association is a good place to start. OSHA and the Chemical Safety & Hazard Investigation Board periodically issue hazard bulletins and accident investigation reports. EPA also issues Chemical Safety Alerts and Enforcement Alerts on recognized hazards. EPA's Emergency Response Notification System (ERNS) is a useful first stop for tracking accidents.

How has OSHA's GDC been applied?

- Similar to the GDC of the Clean Air Act, OSHA's GDC applies when: (a) an employer fails to render a workplace free of hazard; (b) the hazard is recognized either by the employer or generally within the employer's industry; (c) the hazard causes or is likely to cause death or serious harm; and (d) there are feasible means by which the employer can eliminate or materially reduce the hazard.

What are the penalties for non-compliance with the GDC?

- The Clean Air Act Section 113(b) allows EPA to assess penalties of up to $37,500 per day for each violation.

HOW DO I FIND MORE INFORMATION ON THE GENERAL DUTY CLAUSE, CHEMICAL SAFETY ALERTS, OR THE RISK MANAGEMENT PROGRAM?

RCRA, Superfund & EPCRA Information Center ("Call Center"): 800-424-9346

TITLE III ON INDIAN LANDS: A GUIDE TO THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

HOME

About This Bulletin...

In 1986 Congress passed a law to help local communities, including Indian reservations, protect public health and safety and the environment from chemical hazards. This law, the Emergency Planning and Community Right-to-Know Act, known as Title III of the Superfund Amendments and Reauthorization Act (SARA), requires that detailed information about the nature of hazardous substances in or near reservations be made available to the public and that comprehensive emergency plans be prepared to deal with chemical accidents. The law also provides stiff penalties for companies that do not comply, and it allows citizens to file lawsuits against companies and government and Tribal agencies to force them to obey the law.

EPA published a rule-making in the Federal Register (July 26, 1990) designating Indian Tribes and their chief executive officers as the implementing authority for Title III on all Indian lands. EPA policy is to work with Tribes on a "government-to-government" basis. Unless Tribal leaders choose another of their various options to comply with Title III, EPA will regard Federally recognized Tribal reservations as a Tribal Emergency Response Commission (TERC), with the same responsibilities as States for carrying out provisions of the law.

This bulletin is intended to make Indian leaders familiar with Title III requirements and provide guidance for complying with Title III. The bulletin is divided into three parts: (1) How Title III Works; (2) Resources Available to TERCs and LEPCs Implementing Title III; and (3) Everyone Is Involved in Title III.

PART ONE: How Title III Works

Title III contains four major provisions: (1) planning for chemical emergencies, (2) emergency notification of chemical accidents and releases, (3) reporting of hazardous chemical inventories, and (4) toxic chemical release reporting.

The law also deals with trade secrets, disclosure of information to health professionals, and public access to information gathered under the law. Each of the main provisions of the law are described in this section.

1. Emergency Planning (Sections 301-303)

- Tribal chief executive officers appoint Tribal emergency response commissions (TERCs). Governors appoint State emergency response commissions (SERCs).
- TERCs (or SERCs) establish emergency planning districts and appoint, supervise, and coordinate local emergency planning committees (LEPCs).
- Facilities notify TERCs (or SERCs) and LEPCs if they have extremely hazardous substances present above "threshold planning quantities," and participate in emergency planning.
- LEPCs develop focal emergency response plans and review them at least annually.

The emergency planning section of the law is designed to help your reservation prepare for and respond to emergencies involving hazardous substances. Every community in the United States, including Indian reservations, must he part of a comprehensive plan.

Indian leaders may select one of the following options in order to comply with this part of Title III:

- Form an independent TERC and either appoint a separate LEPC or act as a TERC/LEPC and perform the same functions as a SERC and LEPC respectively.
- Indian Tribes may enter into cooperative agreements with another Tribe or a consortium of Tribes or the State within which its lands are located to achieve a workable Title III program.

For the purposes of Title III, a cooperative agreement is any formal agreement reached by the States and Tribes that meets the needs of the parties to the agreement and is entered into with full knowledge and consent. Each agreement is expected to be unique and to meet the specific needs of the parties. Some examples of these would be the following:

- A Memorandum of agreement (MOA) with the SERC to become a Tribal LEPC or join an off-reservation LEPC and coordinate with the SERC.
- An MOA with the SERC to work with the SERC so that the Tribe implements some but not all of the new law's requirements, while the State implements the rest of the requirements.

a. Tribal Emergency Response Commission (TERC)

The TERC should include broad-based representation, including Tribal public agencies and departments concerned with issues related to environment, natural resources, emergency services, public health, occupational safety, and transportation, as well as any other groups with interest in Title III issues. If the Tribal chairperson does not designate a TERC, the Tribal leader operates as a TERC until a commission is appointed, and assumes all responsibilities described for the TERC. Among the TERC's duties are to:

- Designate local emergency planning districts;
- Appoint a local emergency planning committee (LEPC) to serve each of the districts;

- Coordinate and supervise LEPC activities;
- Coordinate proposals for and distribution of Federal training grant funds;
- Review LEPC plans, recommending any needed changes;
- Notify EPA of all facilities covered under emergency planning requirements, or designated by the TERC as subject to the requirements;
- Establish procedures for receiving and processing public requests for information collected under Title III;
- Ask for further information about a particular chemical or facility, when needed;
- Request information from EPA on the health effects of chemicals that EPA has agreed to designate "trade secret," and ensure that this information is available to the public; and
- Take civil action against facility owners or operators who fail to comply with reporting requirements.

The TERC should ensure that its program is integrated with the federal law in order to strengthen enforcement.

b. The Tribal LEPC

There may be a need for only one LEPC on a reservation. The Tribal LEPC -- whether it is coordinating with a TERC or a SERC -- should be broadly representative of the community and include the Tribal chief, elected Tribal officials, chairmen of appropriate council committees, fire chief, emergency or environmental manager, Indian Health Services (IHS) official, Bureau of Indian Affairs (BIA) official, local news media representatives, Tribal elders, police chief, school official, Tribal attorney, technical personnel or first responder, pesticide officer, representatives of railroads or trucking firms, representatives of chemical or related industries on or near the reservation, and community representatives.

The Tribal LEPC's first jobs are to get organized, receive information, and analyze hazards. The information submitted under Title III will enable the LEPC to conduct a community hazards analysis, identifying the types and locations of chemical hazards, vulnerable areas and populations (e.g., children, elders, and even livestock), and the risk of accidents and their effects on the community. On most Indian reservations in the past, chemical emergencies have resulted from spills of chemicals in transit; as economic development progresses, accidents from fixed facilities may become a larger concern for Indian Tribes.

The list of 360 extremely hazardous substances (EHSs) identified by EPA as having immediate health effects and hazardous properties may serve as a focus for emergency planning, but plans should address all hazardous materials in the community that present risks to public health and safety. These substances are found in some widely used insecticides, herbicides, fertilizers, preservatives, photographic chemicals, and solvents as well as in wastewater treatment and drinking water treatment processes.

The list of EHSs includes a threshold planning quantity for each substance. If this amount or more of the chemical is present at any manufacturing plant, warehouse, hospital, farm, small business, or other facility, the owner or operator must notify both the TERC and the local emergency planning coordinator. This lets the planners know what hazardous chemicals are being used, stored, or transported on or near your reservation.

Once the hazards have been analyzed, the LEPC can work with local facilities to identify opportunities for reducing risks (e.g., by reducing chemical inventories). The LEPC will also prepare various potential accident scenarios and develop a local emergency response plan that must be exercised, reviewed annually, and updated. As required by Title III, the plan should:

- Contain an analysis of hazards on or near the reservation, including both fixed facilities and transportation routes;
- Identify in detail the on-reservation and off-reservation resources, both personnel and equipment, available to respond to a chemical emergency;
- Designate a community coordinator and, where appropriate, identify the facilities coordinator to assist in preparing and implementing the plan;
- Describe emergency response procedures;
- Outline procedures for notifying the community that a release has occurred;
- Describe methods for determining the occurrence of a release and the probable affected area and population;
- Outline evacuation plans;
- Describe a training program for emergency response personnel; and
- Present methods and schedules for exercising emergency plans.

Since membership on the LEPC is broad-based, the LEPC should be familiar with the reservation; it should know about the capacities of local hospitals, and about the location of schools, nursing homes, and other special considerations on the reservation. It should consider all these factors in developing its emergency response plan.

Each facility's owner or operator must also name an employee as facility coordinator, and that person must participate in the planning process. The LEPC will appoint an information coordinator who will receive and process information as it is submitted to the committee and make it available to the public.

The LEPC must publish notices and schedule public meetings to give citizens an opportunity to comment on the LEPC's activities. LEPC meetings will provide a forum for discussions of how the reservation should address hazardous situations identified during the planning process. The LEPC must also conduct emergency drills to make sure the plan will work if an accident occurs.

TERCs must review local emergency plans to ensure coordination across the reservation if there is more than one LEPC, or if coordination with an LEPC beyond reservation boundaries is necessary. EPA encourages Indian Tribes, SERCs, and LEPCs to participate in joint planning and cooperative efforts on a regular basis to prepare for potential emergencies.

2. Emergency please Notification (Section 304)

- Facilities notify TERCs (or SERCs) and LEPCs immediately of accidental releases of hazardous substances in excess of reportable quantities and provide written reports on actions taken and on medical effects.
- TERCs (or SERCs) and LEPCs make accidental release information available to the public.

If there is a chemical accident at a commercial, municipal, or other facility or on a transportation route on your reservation, and if the accident results in the release of any one of a large number of hazardous substances, citizens have a right to know about it. Under Title III, a facility, including facilities owned by the Tribe, must immediately notify the Tribal LEPC and the TERC of the release of more than the predetermined amount of one of these chemicals. If the release results from a transportation accident, the transporter can dial 911 or the local telephone operator to report it. Chemicals covered by this section include not only the 360 EHSs, but also more than 700 hazardous substances subject to the emergency notification requirements of the Superfund hazardous waste cleanup law (some chemicals are on both lists). Superfund requires notification of releases to the National Response Center (NRC), which alerts federal responders. You can notify the NRC of releases 24 hours a day by calling (800) 424-8802.

Immediate notification must include the name of the chemical; the location of the release; whether the chemical is an EHS; how much of the substance has been released; the time and duration of the incident; whether the chemical was released into the air, water, or soil, or some combination of the three; known or anticipated health risks and necessary medical attention; proper precautions, such as evacuation; and a contact person at the facility. The notification will activate emergency plans.

The law also requires follow-up reporting. As soon as practicable after the release, the facility coordinator must submit a written report to both the LEPC and the TERC. The follow-up report must update the original notification and provide additional information on actual response actions taken, known or anticipated health risks, and, if appropriate, advice regarding any medical cart needed by exposure victims. Information on emergency releases will also be considered in the TERC and LEPC planning process.

3. Right-to-Know Reporting (Sections 311-312)

- Facilities submit material safety data sheets (MSDSs) or lists of hazardous chemicals on-site (above “threshold quantities”) to TERCs (or SERCs), LEPCs, and local fire departments.
- Facilities submit emergency and hazardous chemical inventory forms (amounts and locations of chemicals) to TERCs (or SERCs), LEPCs, and local fire departments,
- TERCs {or SERCs) and LEPCs make hazardous chemical information available to the public.

Information about accidental chemical releases is only the beginning of the public’s “right to know” about hazardous substances. Citizens also have a right to information about the amounts, location, and potential effects of hazardous chemicals being used or stored on the reservation. (For a description of the differences among “hazardous chemicals,” “extremely hazardous substances,” and “toxic chemicals,” see the box “Lists of Chemicals.“) Facilities must report this information to the LEPC, the TERC, and local fire departments. The LEPC and TERC, in turn, must make the information available to the public.

Lists of Chemicals

There are four groups of chemicals subject to reporting under Title III. Some chemicals appear in several groups. The groups are:

- Extremely Hazardous Substances (Sections 302 - 304). 360 substances chosen because of their extremely toxic properties. These substances provide an initial focus for chemical emergency planning. Releases must be reported immediately.
- Hazardous Substances (Section 304). About 720 substances listed under previous Superfund hazardous waste cleanup regulations (Section 103(a) of CERCLA). Releases must be reported immediately because they represent an immediate hazard to the community.
- Hazardous Chemicals (Sections 311- 312). Not on a list, but defined by OSHA regulations as chemicals that represent a physical or health hazard. This definition could potentially include many thousands of chemicals. Inventories of these chemicals and material safety data sheets for each of them must be submitted.
- Toxic Chemicals (Section 313). Over 320 chemicals selected by Congress because of their long-term toxicity. Estimates of releases of these chemicals into all media -- air, land, and water -- must be reported annually and entered into a national data base.

This information provides a tool which can be used to lower chemical hazards in the community by reducing chemical inventories and possibly eliminating some hazards by substituting less hazardous chemicals. The reports are also essential for LEPCs and emergency response workers, providing the raw material for the emergency planning process. Fire departments and public health officials will use the information to plan for and respond to emergencies.

Facilities must report on the hazardous chemicals they use and store in two different ways. The first is through material safety data sheets (MSDSs), which contain information on a chemical's physical properties and health effects. Under federal laws administered by the Occupational Safety and Health Administration (OSHA), companies are required to keep MSDSs on file for chemicals used in the workplace. They must also make these sheets available to their employees, so workers will know about the chemical hazards they are exposed to and can take necessary precautions in handling the substances.

Under Title III, facilities must submit either actual copies of the MSDSs, or lists of MSDS chemicals that are present at the facilities in excess of certain amounts. EPA encourages facilities to submit the list of chemicals. This information must be sent to the LEPC, the TERC, and the local fire department. The reporting for this part of the law is based not on any list of specific chemicals, but on a definition of "hazardous chemical" under OSHA's requirements -- essentially any chemical that poses physical or health hazards. As many as 500,000 products can fit this definition and thus, if present above the threshold quantities, must be reported.

The second way that companies must report on hazardous chemicals is by submitting annual inventories of these same hazardous chemicals to the same three organizations -- the LEPC, the TERC, and the local fire department. The law includes a "two-tier" approach for annual inventory reporting. Under Tier I, a facility must report the amounts and general locations of chemicals in certain hazard categories. For example, a Tier I report might say that a facility stores 10,000 pounds of substances that cause chronic health effects. A Tier II report contains basically the same information, but it must name the specific chemical. A Tier II report might say that the facility has 500 pounds of benzene, and it would indicate the physical and health hazards associated with benzene.

Congress gave companies the flexibility to choose whether to file Tier I or Tier II forms, unless State or local laws require Tier II reporting. EPA encourages facilities to submit Tier II reports. In fact, some States require submission of Tier II forms only. TERCs may pass similar Tribal laws regarding section 312 reporting. EPA believes that Tier II reports provide emergency planners and communities with more useful information, and encourages facilities to submit Tier II forms.

Many companies have voluntarily provided Tier II reports. Citizens can gain access to MSDSs and annual inventory reports by contacting the TERC or LEPC. While the information is available to the public, companies can ask that the identify and locations of specific chemicals within the facility be kept confidential.

This means that TERCs, LEPCs, and local fire departments can use the location information but not disclose it to the public.

4. Toxic Chemical Release Reporting (Section 313)

- Covered facilities submit annual reports on yearly routine and accidental toxic chemical releases to States, Tribes, and EPA.
- EPA establishes a national toxic chemical release inventory based on facility reports.
- TERCs (or SERCs) and EPA make release information available to the public and communities, EPA makes the information accessible on a national computerized data base, and by other means.

Along with the information on hazardous chemical usage, storage, and accidental release described above, citizens also have the right to know if certain manufacturing plants are routinely releasing any of some 320 toxic chemicals into the air, water, or soil of the reservation.

This element of Title III applies to facilities in the manufacturing sector (Standard Industrial Codes 20 - 39) with ten or more employees that manufacture, process, or use more than threshold amounts of these chemicals.

They must estimate each year the total amounts of chemicals that they release into the environment -- either accidentally or as a result of routine plant operations -- or transport as waste to another location. Reports must be filed by July 1 of each year covering releases in the previous calendar year.

The annual release reports are submitted to EPA headquarters and to the Tribal environmental, health, or emergency response agency which coordinates with the TERC. EPA is required to compile them into a national computerized data base called the Toxic Release Inventory, or TRI.

This data base must be accessible to the public through computer telecommunications and other means. The data are available on the National Library of Medicine's Foxnet data base. The annual release data can be used, along with the other information the TERC and LEPC receive, to put together a more complete picture of the hazardous substances found on the planning reservation.

Companies can also use the release information they collect to assess their operations with an eye to reducing the amount of toxic chemicals they use and release into the environment.

What the TRI can do best is to serve as a "pointer" to potential toxic chemical problems. The TRI will enable EPA, Tribal leaders, and citizens to look for "hot spots," or areas with apparently high emission levels.

Using this information, environmental agencies can set priorities for further investigation and possible regulatory or other action, if needed, to protect public health and the environment. Environmental agencies, as well as public-interest organizations and LEPC's, can also use the data to encourage facilities to cut back on their releases.

5. Trade Secrets (Section 322)

- Facilities may claim chemical identify information trade secret, but must substantiate the claim.
- Trade secret information may be disclosed to health professionals for diagnostic, treatment, and prevention purposes.
- Citizens may challenge trade secret claims by petitioning the EPA.

PART TWO: Resources Available to TERCs and LEPCs Implementing Title III

Guidance and Technical Assistance

To help Tribal officials as they develop their emergency plans, the National Response Team (NRT) has published the Hazardous Materials Emergency Planning Guide (NRT-1). In addition, EPA, the Federal Emergency Management Agency (FEMA), and the Department of Transportation (DOT) have published a follow-up document Technical Guidance on Hazards Analysis which tells emergency planners how to identify the hazards in the planning district, determine vulnerable zones for each hazard, assess risk, and then set priorities among hazards and begin to develop an emergency plan.

Computer Aided Management of Emergency Operations, CAMEO™, is a software program which can assist you to manage and use information collected under SARA Title III and conduct a community hazards analysis. It also includes response information for over 3,000 chemicals commonly transported in the United States.

The system was developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA to assist emergency responders, emergency planners, and others involved in activities concerned with the safe handling of chemicals, and is being used by local governments, fire departments and industry throughout the United States.

CAMEO™ is now available for both Macintosh and IBM-compatible computers. For information regarding CAMEO™, contact your EPA regional office or the Emergency Planning and Community Right-To-Know Information Hotline at (800) 535-0202.

EPA has also published documents to help industry comply with the reporting provisions of Title III, and to help Tribal and local officials manage and analyze the information submitted.

For example, the requirements of Section 313 are described in *The Emergency Planning and Community Right-to-Know Act: Section 313 Release Reporting Requirements.*

EPA and FEMA staff are also helping TERCs administer the law by sponsoring workshops, speaking at meetings of TERCs and LEPCs, and providing guidance for developing and testing local emergency plans and managing, understanding, and communicating the information submitted under Title III.

Training

EPA offers a number of training activities in preparing for, responding to, and preventing chemical accidents through the Agency's Environmental Response Team and joint efforts with FEMA, DOT, and other federal agencies. FEMA provides training grants that may be used by Tribal officials, which will be provided through the TERCs or other agencies. The purpose of the grants is to allow Tribal communities to gain or improve on the skills necessary for carrying out emergency planning and preparedness programs.

The Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTUSA) includes funding grants for States and Indian Tribes for training public sector employees in hazmat response; these funds may be used for tuition costs, employee and trainer travel expenses, and employee room and board at training facilities. Eligibility for these grants requires compliance with Title III. HMTUSA also provides for planning grants for developing, improving, and implementing Title III plans, including the determination of transportation flow patterns of hazardous materials, and for determining the need for regional hazmat emergency response teams. Finally, HMTUSA provides for grants for developing a training curriculum that will be distributed to TERCs and LEPCs. Tribes should contact EPA Regional offices to learn how to apply for training grants as well as to learn whether and how they can qualify for planning grants.

Toxic Release Inventory

EPA annually compiles the computerized Toxic Chemical Release Inventory. The national data base is made available to the public through computer telecommunications. TRI information is also available in other formats including: microfiche, which is available for free in many Federal Depository Libraries and other libraries, and on computer diskettes, CD-ROM, magnetic tape, and in a published annual report all of which are available for sale through the Government Printing Office and the National Technical Information Service. Information about the TRI data base can be obtained by writing to:

U.S. Environmental Protection Agency, Attention: TRI Public Inquiry

P.O. Box 70266, Washington, DC 20024-0266

or by calling the TRI User Support Service at (202) 260-1531.

Enforcement

- The government may assess civil and administrative penalties of $10,000 to $75,000 per day against facilities that fail to comply with the above provisions.
- Anyone who knowingly and willful& fails to provide emergency release notification is subject to criminal penalties of up to $50,000 or five years in prison.

- The TERC, SERC, LEPC, or the State or local government may initiate actions against facility owners or operators for failure to comply with Title III requirements.
- Citizens may initiate civil actions against EPA, TERCs, SERCs, and facility owners and operators for failure to comply with certain aspects of the law.
- Anyone who knowingly and willfully discloses trade secret information may face penalties up to $20,000 and/or one year in prison.
- States may sue EPA for failure to provide trade secret information.

EPA has a major role to play in the enforcement of Title III. The Agency is providing assistance to Tribal communities for specific enforcement actions against violators of sections 302, 311, and 312. Since EPA does not receive or process information under these sections, and TERCs and LEPCs do, actions should be initiated at the reservation and district levels. EPA will assist as much as possible. Under sections 304 and 313, EPA does have a statutory mechanism to receive information directly from submitters. The Agency has already taken the lead in bringing enforcement actions against violators of these sections.

PART THREE: Everyone Is Involved in Title III

The Emergency Planning and Community Right-To-Know Act is meant to involve everyone – including ordinary citizens, health professionals, industry, public-interest organizations, and the local, Tribal, State, and federal government agencies responsible for emergency planning and response, public health, and environmental protection -- in the process of understanding chemical hazards and planning for chemical accidents. In the past, most of the responsibility for these activities fell to experts in government and industry. To the extent that members of the community participated, it was generally "from the outside looking in." They did what they could to influence decisions that were, for the most part, out of their hands. But under the provisions of Title III, everyone has a role to play in making the law work for the benefit of the entire community. The law requires facilities to provide information on the presence of hazardous chemicals on your lands directly to the people who are most affected, by the potential risks posed for public health and safety, the environment, jobs, the local economy, property values, and other factors. These people are also best able to do something about assessing and managing risks, through inspections, enforcement of local codes, reviews of facility performance, and, when appropriate, political and economic pressures.

This relationship between the Title III data and community action can best occur at the local level, through the work of the TERC or Tribal LEPC. For example, if a firm on the reservation has reported the presence of extremely hazardous substances at its facility, several accidents, substantial quantities of chemicals, and continuing releases of toxic chemicals, the Tribal community has the data it needs to seek appropriate corrective action. In short, the law opens the door to community-based decision-making on chemical hazards for citizens and communities throughout the nation.

Citizens

The TERC or Tribal LEPC serves as a focal point on the reservation for information and discussions about hazardous substances, emergency planning, and health and environmental risks. The TERC or Tribal LEPC can most effectively carry out its responsibilities as a community forum by taking steps to educate the public about chemical risks, and working with facilities to minimize those risks. The LEPC's ability to improve the safety and health of its community will be greatly enhanced by the support of an informed and active community. By volunteering to work with LEPCs, citizens can play a major role in making the law work. There are several ways you as individuals can become involved in obtaining and using this information:

- Make sure that the TERC or LEPC has been formed, attend its meetings, and make sure it is fully representative of the Tribe. Volunteer to serve as a community representative.
- Make sure that the TERC or LEPC has obtained all the information it needs from local facilities to prepare a comprehensive emergency response plan.
- Review and comment on the emergency response plan, and ask questions about how procedures set out in the plan affect you, your family, or your place of business.
- Ask for information from the LEPC or TERC about chemical hazards, inventories, and releases on your reservation. Make sure both the TERC and LEPC have established procedures to make the information reported under Title III readily available to the public. Ask the LEPC what facilities are doing to reduce chemical hazards.
- Use the national Toxic Release Inventory (TRI) data base to obtain information on routine releases of toxic chemicals on your reservation. Your LEPC should have this information. If not, you or your LEPC can get the TRI information from a local library, your State, or the EPA Reporting Center in Washington, DC.
- Call or visit facilities on the reservation and ask if they have complied with the reporting requirements.

Title III allows citizens to sue the owner or operator of a business or facility who does not comply with the law, as long as that person is not facing a government administrative order or civil action to force compliance. Citizens can also sue EPA or the TERC if they fail to provide information that must be made public under Title III, petition EPA to add or delete chemicals from the list of toxic chemicals that must be reported under the toxic chemical release inventory, and petition to change the list of extremely hazardous substances used for emergency planning and accidental release notification.

Fire Departments

Because fire departments are often the first to respond to a hazardous chemical emergency, they must be involved in every aspect of the emergency planning and community right-to-know program. Fire departments will be involved in emergency planning through their participation in the work of LEPCs. It is essential that fire departments are involved in their LEPCs not only to ensure they are a part of the system but because fire departments have important expertise regarding chemical hazards and emergency planning. The community emergency response plan must include hazardous chemical emergency training for response workers, including firefighters. Federal programs are available to train firefighters for dealing with emergencies involving chemical hazards.

Fire departments will also receive information about hazardous chemicals from facilities within their jurisdiction. This information, in the form of either material safety data sheets (MSDSs) or lists of MSDS chemicals and hazardous chemical inventory forms, will be the same as the data submitted to LEPCs and TERCs. For facilities located on Indian reservations, the fire department run by the Tribe will be the fire department designated to receive section 311 and 312 reports.

Hospitals, Schools, and Other Public Institutions

Public institutions such as hospitals, schools, and Tribal governments are vital to the success of any emergency response plan. Ambulance crews and emergency room personnel must know how to transport and treat victims of exposure to hazardous chemicals. Victims of chemical accidents can contaminate emergency rooms and cause hospitals to close temporarily. Schools and public buildings should plan for emergencies and may be identified as emergency shelters for evacuees. The following are other ways in which public institutions can participate in emergency planning and hazardous chemical risk reduction:

- Representatives of these institutions should be members of the LEPC, or at least learn who represents public institutions on the committee and stay in contact with that person.
- The institutions' officers should inform the LEPC of sensitive facilities within the community (e.g., hospitals, schools, and nursing homes) that should be included in the emergency response plan. These officers should know how they will be notified in the event of an accident and be prepared to respond in accordance with emergency response plans.
- Community environmental and health agencies, in addition to participating on TERCs and LEPCs, should take advantage of the new reporting requirements to build an information base about hazardous chemicals on their reservation. The agencies can use this information to work with industry on voluntary programs to reduce the amounts and risks of hazardous chemicals used or released on the reservation.

Health Professionals

Doctors, nurses, and other trained medical professionals who serve in government health departments, hospitals, and private practice can be a valuable resource in emergency planning and response. They can also be an important source of information about risks to the public health in their communities. Some of the ways they can participate in emergency planning include:

- Volunteering to be a health professional representative on the LEPC, or offering to assist the LEPC in its work.
- Participating in programs to train medical personnel to deal with emergencies involving chemical hazards.
- Screening the information submitted under Title III to determine if any acute or chronic health effects may be associated with hazardous substances on the reservation.

In a more general sense, health professionals may be approached to provide and interpret information on chemicals available under the law. The law allows health professionals to gain access to chemical identity information, even if it is claimed as trade secret, in three different situations:

- If the chemical identity is needed for the diagnosis and treatment of an exposed person.
- If a medical emergency exists in which the chemical identity is needed to aid in diagnosis or treatment.
- If a health professional who is a local government employee requests a chemical's identity to conduct preventive research studies and to render medical treatment.

Except for medical emergencies, the request for a chemical's identity must be accompanied by a written statement of need and a confidentiality agreement.

Industry and Small Businesses

Hazardous substances are not only found at large chemical plants. They are also used routinely in many small operations like garages and dry cleaners, which are more likely to be present on Indian lands than large manufacturing facilities. Not all chemicals are hazardous in normal practice, but they may be of concern if stored or used improperly, or during an emergency such as a fire. A company's initial responsibility under Title III is to determine whether it has reporting and emergency planning obligations, and if so, to meet them. The Indian leaders should check to see if any listed chemicals are present in buildings owned by the reservation.

The annual toxic chemical release reporting requirement (Section 313) applies only to manufacturing facilities with ten or more full-time employees. Therefore, many small businesses on Indian lands will not be subject to this requirement because they do not meet the manufacturing, processing, or use thresholds. All businesses, however, both manufacturing and nonmanufacturing, are required to report under the emergency planning, emergency release notification, and hazardous chemical reporting provisions of the Act if they have specified chemicals in amounts greater than the threshold quantities for those chemicals.

Farmers

The presence of pesticides and fertilizers on a farm can present a potential hazard to the community – especially if the farm is located near a populated area or near transportation routes. Farmers on your reservation, therefore, may be subject to one or more of the reporting requirements of Title III.

- Sections 301 - 303. Farmers should determine if they are using any of the 360 extremely hazardous substances that trigger the Act's emergency planning reporting requirement. If so, and if one or more of the substances exceeds specified amounts, the farm must notify the TERC and LEPC that it is covered by the emergency planning requirements. The farm must also name a contact person in case the LEPC needs additional information to develop the emergency response plan for the community. Because the circumstances under which farmers have and use extremely hazardous substances may be different from other businesses, it is important that an agriculture representative be included on the LEPC.
- Section 304. Generally, farmers must notify the TERC and LEPC if there is a release of an extremely hazardous substance, or a substance listed under the Superfund hazardous waste cleanup law, in excess of its "reportable quantity." There are two exceptions that may exclude farmers from this reporting requirement. First, reporting is required only by facilities that produce, use, or store a "hazardous chemical." Under the definition of a hazardous chemical, substances that are used in routine agricultural operations and household or consumer products are specifically exempt. Second, the proper application of a registered pesticide or fertilizer in accordance with its intended purpose is exempt from emergency release notification. In other words, farmers do not need to report routine pesticide and fertilizer application as emergency releases. An accidental release above a reportable quantity of those substances should, however, be reported.
- Sections 311 - 312. These reporting requirements are tied to the worker notification rules of OSHA, so farmers may be covered if they already must comply with the OSHA regulations. Farms with fewer than ten full-time employees are not covered by OSHA and consequently are exempt from this requirement. Chemicals used in routine agriculture operations and household and consumer products are exempt from reporting because they do not meet the law's definition of hazardous chemicals.
- Section 313. These requirements cover only manufacturing facilities with ten or more employees. Thus, only farms that are involved in manufacturing operations as a primary activity (such as food and tobacco manufacturing) would be covered under this section, but only if their use of listed chemicals exceeds the threshold levels for reporting.

CHEMICAL EMERGENCY PREPAREDNESS AND PREVENTION ON TRIBAL LANDS

HOME

The Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Air Act's (CAA) chemical accident prevention provisions in section 112(r) require facilities to provide information on the presence of hazardous chemicals in communities. These laws have built better relationships among government at all levels, business and community leaders, environmental and other public-interest organizations, and individual citizens. EPA intends this fact sheet to familiarize Tribal leaders with EPCRA and CAA section 112(r) Risk Management Program requirements and how the information gathered under these laws can enhance Tribal chemical accident prevention, preparedness and response activities.

Overview

EPCRA and the CAA section 112(r) Risk Management Program requires facilities to report on hazardous chemicals they store or handle. Both laws give the public access to these reports.

The CAA explicitly authorized EPA to treat Federally Recognized Tribes in the same manner as States for the purposes of implementing environmental programs. For the purposes of EPCRA, EPA has taken the position that all Federally Recognized Tribes have the same responsibilities as States.

As a result of these two laws provide an array of complementary information on what chemicals are in the community; what chemicals are present at each location; what hazards these chemicals pose; what chemical releases have occurred in the area; and what steps industry is taking to prevent additional accidents.

This information can be used to enhance your community emergency response plan and protect your community from chemical hazards.

A Role for Tribes in EPCRA

Under sections 301-303 of EPCRA, States form State Emergency Response Commissions (SERCs). Likewise, Tribal chief executive officers must appoint Tribal Emergency Response Commissions (TERCs) to accomplish the following:

1. Designate local emergency planning districts;
2. Appoint a local emergency planning committee (LEPC) to serve each of the districts;
3. Coordinate and supervise LEPC activities;
4. Coordinate proposals for and distribution of Federal grant funds fir TERCs and/or Tribal LEPCs;
5. Review LEPC plans, recommending any needed changes;
6. Establish procedures for receiving and processing public requests for information collected under EPCRA; and
7. Ask for further information about a particular chemical or facility, when needed.

Forming a TERC. Through TERCs, Tribes provide leadership to ensure that an EPCRA emergency planning and implementation structure is developed. Additionally, TERCs provide training and technical assistance to communities so that Tribal members know what to do in the event of a chemical accident.

The Tribal chief executive officer operates as the TERC if a TERC is not established or a cooperative agreement is not developed. A Tribe may choose to enter into cooperative agreements with another Tribe or a consortium of Tribes or the State within which its lands are located to achieve a workable EPCRA program. Some examples of a cooperative agreement include:

1. A Memorandum of Agreement (MOA) with the SERC to become a Tribal LEPC or join an off-reservation LEPC.
2. A MOA with the SERC so that the Tribe implements some but not all of the law's requirements, while the State implements the remainder.

LEPC Responsibilities LEPC responsibilities depend upon the needs of the local community and Tribes often find that the SERC itself can accomplish the work of the LEPC. However, if an LEPC is formed, its membership must include, at a minimum, local officials such as police, fire, civil defense, public health, transportation and environmental professionals, industry representatives of facilities subject to the emergency planning requirements of EPCRA, community groups, and the media.

LEPCs must develop a contingency plan to prepare for and respond to emergencies involving hazardous substances in their communities. The plans should include:

- The identity and location of hazardous
- materials;
- Procedures for an immediate response to a chemical accident;
- Public notification of evacuation or shelter-in-place procedures;
- Industry contact names; and
- Timetables for testing and updating the plan.

The plans should be reviewed annually, exercised, and updated annually to best meet the needs of the reservation.

LEPCs also receive the emergency release notifications and the annual hazardous chemical inventory information submitted by facilities (see the "What Information Do You Have Section?" of this factsheet). This information can help the LEPC keep its plan and response procedures up-to-date.

A Role for Tribes in the CAA Section 112r Risk Management Program

Under the CAA section 112(r), Tribally-owned facilities with processes exceeding a threshold quantity for 77 acutely toxic substances (such as chlorine and ammonia) and 63 highly volatile flammable substances (when not used as a fuel), must adopt a Risk Management Program. An example of such a Tribally-owned facility would be a drinking water facility holding more than 2,500 pounds of chlorine. Additionally, a summary of the program, known as a risk management plan (RMP) must be submitted to EPA. The RMP includes:

- The facility hazard assessments, including worst-case release and alternative release scenarios;
- The facility accident prevention activities, such as the use of special safety equipment, employee safety training programs, and process safety hazards analyses conducted by the facility;
- The past chemical accidents at a facility;
- The management system in place at the facility; and
- The facility's emergency response program.

RMPs that have been submitted can be reviewed at http://www.epa.gov/enviro.

If a Tribe is authorized under the Clean Air Act Tribal Air Rule (40 CFR Part 49) for treatment as a State, it can obtain delegation for the RMP program. If the TERC passes its own chemical safety legislation, it should ensure that its program mirrors the federal law in order to strengthen enforcement capabilities.

NOTE: On August 4, 2000, EPA and the Department of Justice published a rule outlining how the public and members of TERCs, SERCs and LEPCs can access offsite consequence analysis (OCA) information about facilities that have submitted an RMP. A TERC or Tribal LEPC member can receive the information directly from EPA for use in their official government position (e.g., to incorporate the information into their emergency preparedness plans). For more information on this rule and how you can access the OCA information, visit the EPA website at http://www.epa.gov/emergencies or call your EPA Regional Contact.

What Information Do You Have?

Regulatory requirements, by themselves, do not guarantee safety from chemical accidents. Both EPCRA and the Risk Management Program encourage communication between facilities and the surrounding communities about chemical safety and chemical risk. In this way, accident prevention is focused at the local level where the risk is found. For example, talking with industry about both the quantities of a chemical and a facility's prevention program allows local emergency officials and the Tribe as a whole to gain a clearer picture of the chemical risk on your lands.

Under EPCRA, you receive information from covered facilities on the chemicals they have, the quantities of chemicals stored, the hazards associated with those chemicals, and information on storage locations and conditions. Specifically, EPCRA provides you with:

- Notification from facilities that it has extremely hazardous substances (EHSs) in excess of a certain threshold. (EPCRA sections 302 and 303).
- Notification from facilities if there is an accidental chemical release of an EHS or any substance regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This information is reported to the TERC/LEPC community emergency coordinator. (EPCRA section 304).
- Material Safety Data Sheets (MSDSs) or lists of hazardous chemicals. MSDSs contain information on the quantity, hazard category, and location and storage conditions of hazardous chemicals at facilities. This information is directly reported to the TERC/LEPC and the appropriate fire department. (EPCRA sections 311 and 312).

Annual reports on planned releases of toxic chemicals from regulated facilities. This information is reported to EPA. EPA compiles this information in a database called the Toxics Release Inventory (TRI) and makes the information available to the public. (EPCRA section 313). This information can be received on the Internet at http://www.epa.gov/enviro.

How Can Tribes Use This Information?

Combining this EPCRA information with the Risk Management Program information listed above, allows you to gain a better understanding of the chemical risk on your land. For example, what precautions are in place to avoid a chemical release? Is a facility near a medical clinic or a highly traveled area? What procedures have been developed to notify and assist the people affected by an accidental release? Has the fire department coordinated with the facility to determine the best response procedures? If the Tribe does not have a fire department, are mutual aid agreements in place with an off-reservation department? Using the chemical information available to you opens a new avenue of communication between you and the facility on your land.

These programs also offer you an opportunity to partner with other Tribes or possibly the States and/or towns that border your lands. In reviewing your emergency response plan, do you see some areas that need to be updated or otherwise improved? Are there chemical risks in a locality bordering your land that need to be addressed? Some Tribes have developed MOAs and/or mutual aid agreements with their neighbors in order to meet these needs, thereby lowering their chemical risk while creating better prevention and response plans.

What Else Should Tribes Consider?

Deliberate Chemical Releases. TERCs and LEPCs should also address the possibility of deliberate chemical releases in their emergency response plans. For example, accidental releases often occur when illegal drug makers steal anhydrous ammonia to produce methamphetamines. Another possible scenario would be a terrorist incident. TERCs and LEPCs should focus on using established mechanisms rather than creating new organizations to deal with these issues. Several sections of a Tribe's response plan, including emergency contact information, response functions, and hazards analysis, should be evaluated to consider the effect of a deliberate release. The CEPPO Chemical Safety Alerts Anhydrous Ammonia Thefts and LEPCs and Counter-Terrorism provides more information on this topic.

Citizen Suits. EPCRA section 326 allows citizens to initiate civil actions against EPA, TERCs, and the owner or operator of a facility for failure to meet the EPCRA requirements. A TERC, LEPC, and State or local government may institute actions against facility owner/operators for failure to comply with EPCRA requirements.

Available Resources

Data Sources. These are several websites that can provide you with information to help you implement EPCRA and the CAA Risk
Management Program.

- Profiles of the EPCRA extremely hazardous substances are available at http://www.epa.gov/emergencies
- EPA maintains information on accidental releases reported under EPCRA in a database, the Emergency Response Notification System (ERNS). You can access ERNS online at: http://www.nrc.uscg.mil/foia.html
- MSDSs do not have a standard format and can sometimes be confusing. On-line databases, which often have multiple versions of MSDSs for individual chemicals, can help you find an MSDS that is well organized and easy to read. You can access online copies of MSDSs maintained by universities at http://www.hazard.com.
- TRI and RMP data can be accessed through Envirofacts at http://www.epa.gov/enviro. Also available in Envirofacts are data on
- facilities that have:
    - Permits to release substances to water, in the Permit Compliance System database.
    - Permits to release hazardous pollutants to air, in the air release database.
    - Permits to store and treat hazardous wastes, in the RCRA database.

Guidance. To help officials as they develop their emergency plans, the National Response Team (NRT) has published the Hazardous Materials Emergency Planning Guide (NRT-1), which is available at http://www.nrt.org. In addition, FEMA has published the State and Local Guide (SLG) 101: Guide for All-Hazard Emergency Operations Planning, which tells emergency planners how to identify hazards in the planning district, determine vulnerable zones for each hazard, assess risk, and then set priorities among hazards and begin to develop an emergency plan. This publication is available at http://www.fema.gov or by calling FEMA's Printing and Publications Branch at (800) 480-2520.

EPA has also published documents to help industry comply with the reporting provisions of EPCRA and to help Tribal and local officials manage and analyze the information submitted. One of these documents is a factsheet entitled The Emergency Planning and Community Right-to-Know Act (EPA 550-F-00-004), which is available at: http://www.epa.gov/emergencies/index.htm

EPA and FEMA staff also help TERCs administer EPCRA and understand RMP by sponsoring workshops, speaking at TERC and LEPC meetings, providing guidance for developing and testing local emergency plans, and managing, understanding, and communicating the information submitted under EPCRA.

EPA has published several guidance documents which may assist TERCs and LEPCs with the RMP requirements. Each of the following guidance documents are available for free by calling EPA's distribution warehouse at 1-800-490-9198 or visiting the EPA website at http://www.epa.gov/ceppo/ap-imag.htm:

- *RMPs Are on the Way* (EPA 550-B99-003)
- *Risk Management Programs Under CAA Section 112(r) - Guidance for Implementing Agencies* (EPA 550-B98-002)
- *Guidance for Auditing Risk Management Plans/Programs under Clean Air Act Section 112(r)* (EPA550-B99-008)

Software. Computer Aided Management of Emergency Operations (CAMEO) is a software program that can assist you to manage and use information collected under EPCRA and conduct a community hazards analysis. It also includes response information for over 3,000 chemicals commonly transported into the U.S. You can obtain CAMEO by visiting the EPA/NOAA CAMEO website at http://www.epa.gov/emergencies/content/cameo/index.htm

RMP*Comp helps users complete the offsite consequence analysis that is required under the Risk Management Program. You can also use RMP*Comp to verify data submitted by industry. When you use RMP*Comp, (a) you don't need to make any calculations by hand and (b) the program guides you through the process of making an analysis. You can obtain RMP*Comp by visiting http://www.epa.gov/emergencies/content/rmp/index.htm

Financial Assistance. EPA's Chemical Emergency Preparedness and Prevention (CEPP) Technical Assistance Grants offer funding aid to Tribes in establishing TERCs, in developing emergency plans, and in preparing to integrate accident prevention information into their plans. These activities are related to EPCRA and Section 112(r) of the CAA.

The grantee must provide matching funds equal to 25 percent of the total project cost. To obtain further information on the CEPP grants, contact your EPA Regional Contact (see below). The Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and LEPCs for hazmat planning. For more information, visit http://hazmat.dot.gov/training/state/hmep/hmep.htm

One comprehensive source of financial assistance information is the Tribal Environmental and Natural Resource Assistance
Handbook produced by the Domestic Policy Council Working Group on American Indians and Alaska Natives. This handbook provides a central location for federal sources of technical and financial assistance available to Tribes for environmental management. The handbook is available online at http://www.epa.gov/tribalportal/

CHEMICAL EMERGENCY PREPAREDNESS AND PREVENTION IN INDIAN COUNTRY

The Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Air Act's (CAA) chemical accident prevention provisions in section 112(r) require facilities to provide information on the presence of hazardous chemicals in communities. These laws have built better relationships among government at all levels, business and community leaders, environmental and other public-interest organizations, and individual citizens. The purpose of this fact sheet is to familiarize tribal leaders with EPCRA and CAA Section 112(r) Chemical Accident Prevention Program requirements. The information available under these laws can promote an integrated approach to chemical safety on tribal lands.

HOW DO EPCRA AND CAA APPLY TO TRIBAL LANDS?

EPCRA and the CAA Section 112(r) Chemical Accident Prevention Program require facilities to report on hazardous chemicals they store or handle. These two laws provide an array of complementary information on what chemicals are in the community, what chemicals are present at each location, what hazards these chemicals pose, what chemical releases have occurred in the area, and what steps industry is taking to prevent additional accidents.

Both laws give the public access to these reports. The information can be used to enhance the community emergency response plan and protect local communities from chemical hazards. Because of the importance of making this information available to all communities, EPA recognized tribal governments as the appropriate implementing authority of EPCRA in Indian Country. Through regulation, federally recognized tribes have the same role as states in the development of chemical emergency preparedness programs under EPCRA. In addition, the CAA provides that eligible federally recognized tribes may implement provisions of the CAA in the same manner as states within reservations and non-reservation areas under their jurisdiction.

WHAT ARE TRIBAL ROLES UNDER EPCRA?

Under Sections 301-303 of EPCRA, states form State Emergency Response Commissions (SERCs). Similarly, tribal chief executive officers appoint Tribal Emergency Response Commissions (TERCs) to accomplish the following:

- Designate local emergency planning districts as needed.
- Appoint a local emergency planning committee (LEPC) to serve each of the districts.
- Coordinate and supervise LEPC activities.
- Coordinate proposals for and distribution of federal grant funds for TERCs and/or tribal LEPCs.
- Review LEPC plans and recommend any needed changes.
- Establish procedures for receiving and processing public requests for information collected under EPCRA.
- Obtain further information about a particular chemical or facility, when needed.

Forming a TERC

Through TERCs, tribes can ensure the development of an emergency planning and implementation structure relevant to community needs. Additionally, TERCs can provide training, technical assistance, and information to communities within Indian Country so that persons know what to do in the event of a chemical accident.

There are several options available to tribes in the implementation of EPCRA programs. A tribe may choose to enter into cooperative agreements with another tribe, a consortium of tribes, or the state within which its lands are located to develop an EPCRA program that meets specific tribal needs. Some examples of EPCRA implementation include:

- A tribe may directly implement the program within Indian Country.
- Through a cooperative agreement with the SERC, a tribe may choose to implement some, but not all of the law's requirements, while the state implements the remainder.
- A tribe authorizes the SERC to perform the functions of the TERC within Indian Country and the tribe establishes an LEPC or joins an off-reservation LEPC that works directly with the SERC through a cooperative agreement.

The tribal chief executive officer operates as the TERC when a TERC is not established or a cooperative agreement is not developed.

LEPC Responsibilities

Local circumstances will determine how extensive a chemical safety program should be. Tribes often find that the TERC itself can accomplish the work of the LEPC. However, if an LEPC is formed, its membership must include, at a minimum, local officials such as police, fire, civil defense, public health, and transportation; environmental professionals; industry representatives of facilities subject to the emergency planning requirements of EPCRA; community groups; and the news media.

Among other things, LEPCs develop a contingency plan to prepare for and respond to emergencies involving hazardous substances in their communities. The plans should be reviewed, exercised, and updated annually and should include:

- Identity and location of hazardous materials.
- Procedures for an immediate response to a chemical accident.
- Public notification of evacuation or shelter-in-place procedures.
- Industry contact names.
- Timetables for testing and updating the plan.

Chemical facilities are required to notify LEPCs of emergency releases and to submit annual information on their hazardous chemical inventory (see the “What Information Is Needed?” section of this fact sheet). This information can help the LEPC keep its plan and response procedures up to date.

WHAT ARE TRIBAL ROLES UNDER THE CAA SECTION 112(R) CHEMICAL ACCIDENT PREVENTION PROGRAM?

Under CAA section 112(r), all chemical facilities with processes exceeding a threshold quantity for 77 acutely toxic substances (such as chlorine and ammonia) and 63 highly volatile flammable substances (when not used as a fuel), must implement a Risk Management Program. An example of a facility subject to the Chemical Accident Prevention Program requirements would be a drinking water facility holding more than 2,500 pounds of chlorine. All facilities subject to such requirements must submit a summary of the program, known as a risk management plan (RMP) to EPA. The RMP includes:

- The facility hazard assessments, including worst-case release and alternative release scenarios.
- The facility accident prevention activities, such as the use of special safety equipment, employee safety training programs, and process safety hazards analyses conducted by the facility.
- The past chemical accidents at a facility.
- The management system in place at the facility.
- The facility’s emergency response program.

There are special procedures for the public to access RMPs. These procedures are described in the fact sheet Chemical Safety Information, Site Security and Fuels Regulatory Relief Act: Public Distribution of Offsite Consequence Analysis Information at: www.epa.gov/emergencies/docs/chem/ocafactsheet.pdf

Tribes that EPA finds eligible for treatment in the same manner as a state under the Clean Air Act Tribal Air Rule (40 CFR part 49) can apply for authorization to administer the Chemical Accident Prevention Program. If the tribe passes its own chemical safety legislation, it should ensure that its program is at least as stringent as the federal law in order to strengthen enforcement capabilities. For more information on how to receive delegation for your tribe, see Risk Management Programs Under CAA Section 112(r) - Guidance for Implementing Agencies (http://www.epa.gov/oem/docs/chem/iguidfnl.pdf).

WHAT INFORMATION IS NEEDED?

Regulatory requirements, by themselves, do not guarantee safety from chemical accidents. Both EPCRA and the Chemical Accident Prevention Program encourage communication between facilities and the surrounding communities about chemical safety and chemical risk. In this way, accident prevention is focused at the local level where the risk is found. For example, talking with industry about both the quantities of a chemical and a facility’s prevention program allows local emergency officials and the tribe as a whole to gain a clearer picture of the chemical risks within Indian Country.

Under EPCRA, you receive information from covered facilities on the chemicals they have, the quantities of chemicals stored, the hazards associated with those chemicals, and information on storage locations and conditions.

In addition to the RMP database information, TERCs and LEPCs can access offsite consequence analysis (OCA) information about facilities that have submitted a RMP. A TERC or tribal LEPC member can receive the information directly from EPA for official use (e.g., to incorporate the information into their emergency preparedness plans). For more information on how to access the OCA information, visit the OEM Web site (http://www.epa.gov/oem/content/rmp/readingroom.htm).

HOW CAN TRIBES USE THIS INFORMATION?

Combining the EPCRA and Chemical Accident Prevention Program information allows tribes to gain a better understanding of the chemical risks within Indian Country. For example, what precautions are in place to avoid a chemical release? Is a facility near a medical clinic or a highly traveled area? What procedures have been developed to notify and assist the people affected by an accidental release? Has the fire department coordinated with the facility to determine the best response procedures? If the tribe does not have a fire department, are mutual aid agreements in place with non-tribal departments? Using the chemical information available to you opens a new avenue of communication between you and the chemical facilities within Indian Country.

These programs also offer tribes an opportunity to partner with other tribes, states, and/or towns that border Indian Country. In reviewing your emergency response plan, do you see some sections that need to be updated or otherwise improved? Are there chemical risks in a locality bordering your community that need to be addressed? Some tribes have developed memorandums of agreement (MOAs) and/or mutual aid agreements with their neighbors in order to meet these needs, thereby creating better prevention and response plans.

WHAT ELSE SHOULD TRIBES CONSIDER?

EPCRA can provide tribes with the following:

- Notification from facilities that have extremely hazardous substances (EHSs) in excess of a certain threshold (EPCRA sections 302 and 303).
- Notification from facilities if there is an accidental chemical release of an EHS or any hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This information is reported to the TERC and LEPC community emergency coordinator (EPCRA section 304).
- Material Safety Data Sheets (MSDSs) or lists of hazardous chemicals. MSDSs contain chemical-specific information such as type of chemical, toxicity, hazard category, and emergency response procedures. This information and emergency and hazardous chemicals inventory forms (TierI/II) are directly reported to the TERC/LEPCs and the appropriate fire department (EPCRA sections 311 and 312).
- Information on planned releases of toxic chemicals from regulated facilities through the Toxics Release Inventory (TRI) database (EPCRA section 313).

Chemical Releases Due to Criminal Actions

TERCs and LEPCs should also address the possibility of deliberate chemical releases in their emergency response plans. For example, accidental releases often occur when illegal drug makers steal anhydrous ammonia to produce methamphetamines. Another possible scenario would be a terrorist incident. TERCs and LEPCs should use already established mechanisms, when applicable, to address these issues rather than creating new organizations. Several sections of a tribe's response plan, including emergency contact information, response functions, and hazards analysis, should be evaluated to consider the effect of a deliberate release. The EPA Chemical Safety Alerts Anhydrous Ammonia Thefts and LEPCs and Counter-Terrorism provide more information on this topic (http://www.epa.gov/oem/publications.htm#alerts).

EPCRA Section 326 Considerations

EPCRA section 326 allows citizens to initiate civil actions against EPA, SERCs, and the owner or operator of a facility for failure to meet EPCRA requirements. The EPA rulemaking designating federally recognized Indian tribes as the EPCRA implementing authority does not preclude the use of sovereign immunity defense on legal actions against Indian tribes or tribal officials.

WHAT RESOURCES ARE AVAILABLE?

Chemical Data Sources

These are several Web sites that provide information to help you implement EPCRA and the CAA Chemical Accident Prevention Program:

- Profiles of the EPCRA extremely hazardous substances are available at: www.epa.gov/emergencies.
- Information on accidental releases reported under EPCRA is available through the National Response Center at: http://www.epa.gov/emergencies/content/learning/response.htm. Material Safety Data Sheets (MSDS) do not have a standard format and can sometimes be confusing. On-line databases, which often have multiple versions of MSDSs for individual chemicals, can assist in finding an MSDS that is well organized and easy to read. Online copies of MSDSs are maintained by universities at www.hazard.com.
- TRI and RMP data can be accessed through Envirofacts at www.epa.gov/enviro. Envirofacts also provides data on facilities that have:
    - Permits to release substances to water, in the Permit Compliance System database.
    - Permits to release hazardous pollutants to air, in the air release database.
    - Permits to store and treat hazardous wastes, in the RCRA database.

Guidance

To help officials as they develop their emergency plans, the National Response Team (NRT) has published the Hazardous Materials Emergency Planning Guide (NRT-1), which is available at www.nrt.org. In addition, the Federal Emergency Management Agency (FEMA) has published the State and Local Guide (SLG) 101: Guide for All-Hazard Emergency Operations Planning, which tells emergency planners how to identify hazards in the planning district, determine vulnerable zones for each hazard, assess risk, and then set priorities among hazards and begin to develop an emergency plan. This publication is available at http://www.fema.gov/plan/gaheop.shtm or by calling FEMA's Printing and Publications Branch at 1-800-480-2520.

EPA has also published documents to help industry comply with the reporting provisions of EPCRA and to help Tribal and local officials manage and analyze the information submitted. One of these documents is a fact sheet entitled The Emergency Planning and Community Right-to-Know Act (EPA 550-F-00-004), which is available at: http://www.epa.gov/oem/docs/chem/epcra.pdf.

EPA and FEMA staff also help TERCs administer EPCRA and understand the Chemical Accident Prevention Program by sponsoring workshops; speaking at TERC and LEPC meetings; providing guidance for developing and testing local emergency plans; and managing, understanding, and communicating the information submitted under EPCRA.

OEM has published several guidance documents that may assist TERCs and LEPCs with the Chemical Accident Prevention Program requirements. Examples of current guidance documents include the following:

- Risk Management Programs Under CAA Section 112(r) - Guidance for Implementing Agencies (EPA 550-B98-002) at: http://www.epa.gov/emergencies/docs/chem/iguidfnl.pdf
- Guidance for Auditing Risk Management Plans/Programs under Clean Air Act Section 112(r) (EPA550-B99-008) at: www.epa.gov/emergencies/docs/chem/audit_gd.pdf

OEM has also published a Chemical Safety Network series, which shares successful practices in RMP implementation, risk communication, and use of the data.

These documents are available electronically on the OEM Web site. Copies of EPA guidance documents can be obtained by calling EPA's distribution warehouse at 1-800-490-9198.

Software

Computer-Aided Management of Emergency Operations (CAMEO) is a software program that can assist you to manage and use information collected under EPCRA and conduct a community hazards analysis. It also includes response information for over 3,000 chemicals commonly transported in the United States. CAMEO can be accessed at: www.epa.gov/emergencies/content/cameo/request.htm

RMP*Comp helps users complete the offsite consequence analysis that is required under the Chemical Accident Prevention Program. RMP*Comp can be used to verify data submitted by industry. When RMP*Comp is used, by hand calculations are not necessary; the program guides the user through the process of making an analysis. RMP*Comp is available at: www.epa.gov/oem/content/rmp/rmp_comp.htm.

Financial Assistance

One comprehensive source of financial assistance information is the Tribal Environmental and Natural Resource Assistance Handbook produced by the Domestic Policy Council Working Group on American Indians and Alaska Natives. This handbook provides a central location for federal sources of technical and financial assistance available to tribes for environmental management. The handbook is available at: www.epa.gov/indian.

The Department of Transportation's Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance to enhance state, territorial, tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and LEPCs for hazmat planning. For more information, visit http://www.phmsa.dot.gov/hazmat/grants or call 202-366-0001.

FEMA has a grant program to fund six major firefighting preparedness categories: training, wellness and fitness programs, vehicles, firefighting equipment, personal protective equipment, and fire prevention programs. Visit FEMA's Web page at www.fema.gov.

EPA Regional Contact Information

EPA has Regional representatives that can provide you with more information on the subjects discussed in this fact sheet. Please contact the Call Center or use the OEM Web site to find the appropriate EPA Regional point of contact.

EPA 550-F-01-012, August, 2002

CHEMICAL EMERGENCY PREPAREDNESS AND PREVENTION IN INDIAN COUNTRY

HOME

The Emergency Planning and Community Right-to-Know Act (EPCRA) and the Clean Air Act's (CAA) chemical accident prevention provisions in section 112(r) require facilities to provide information on the presence of hazardous chemicals in communities. These laws have built better relationships among government at all levels, business and community leaders, environmental and other public-interest organizations, and individual citizens. The purpose of this factsheet is to familiarize Tribal leaders with EPCRA and CAA section 112(r) Risk Management Program requirements. The information available under these laws can promote an integrated approach to chemical safety on Tribal lands.

Overview

EPCRA and the CAA section 112(r) Risk Management Program require facilities to report on hazardous chemicals they store or handle. These two laws provide an array of complementary information on what chemicals are in the community, what chemicals are present at each location, what hazards these chemicals pose, what chemical releases have occurred in the area, and what steps industry is taking to prevent additional accidents.

Both laws give the public access to these reports. The information can be used to enhance the community emergency response plan and protect local communities from chemical hazards. Because of the importance of making this information available to all communities, EPA recognized Tribal governments as the appropriate implementing authority of EPCRA in Indian Country. Through regulation, Federally recognized Tribes have the same role as States in the development of chemical emergency preparedness programs under EPCRA. In addition, the CAA provides that eligible Federally recognized Tribes may implement provisions of the CAA in the same manner as States within reservations and non-reservation areas under their jurisdiction.

A Role for Tribes in EPCRA

Under sections 301-303 of EPCRA, States form State Emergency Response Commissions (SERCs). Similarly, Tribal chief executive officers appoint Tribal Emergency Response Commissions (TERCs) to accomplish the following:

- Designate local emergency planning districts as needed.
- Appoint a local emergency planning committee (LEPC) to serve each of the districts.
- Coordinate and supervise LEPC activities.
- Coordinate proposals for and distribution of Federal grant funds for TERCs and/or Tribal LEPCs.
- Review LEPC plans, recommending any needed changes.
- Establish procedures for receiving and processing public requests for information collected under EPCRA.
- Obtain further information about a particular chemical or facility, when needed.

Forming a TERC. Through TERCs, Tribes can ensure the development of an emergency planning and implementation structure relevant to community needs. Additionally, TERCs can provide training, technical assistance, and information to communities within Indian Country so that persons know what to do in the event of a chemical accident.

There are several options available to Tribes in the implementation of EPCRA programs. A Tribe may choose to enter into cooperative agreements with another Tribe, a consortium of Tribes, or the State within which its lands are located to develop an EPCRA program that meets specific Tribal needs. Some examples of EPCRA implementation include:

- A Tribe may directly implement the program within Indian Country.
- Through a cooperative agreement with the SERC, a Tribe may choose to implement some, but not all of the law's requirements, while the State implements the remainder.
- A Tribe authorizes the SERC to perform the functions of the TERC within Indian Country and the Tribe establishes an LEPC or joins an off-reservation LEPC that works directly with the SERC through a cooperative agreement.

The Tribal chief executive officer operates as the TERC when a TERC is not established or a cooperative agreement is not developed.

LEPC Responsibilities. Local circumstances will determine how extensive a chemical safely program should be. Tribes often find that the TERC itself can accomplish the work of the LEPC. However, if an LEPC is formed, its membership must include, at a minimum, local officials such as police, fire, civil defense, public health, and transportation; environmental professionals; industry representatives of facilities subject to the emergency planning requirements of EPCRA; community groups; and the news media.

Among other things, LEPCs develop a contingency plan to prepare for and respond to emergencies involving hazardous substances in their communities. The plans should be reviewed, exercised, and updated annually and should include:

- The identity and location of hazardous materials.
- Procedures for an immediate response to a chemical accident.

- Public notification of evacuation or shelter-in-place procedures.
- Industry contact names.
- Timetables for testing and updating the plan.

Chemical facilities are required to notify LEPCs of emergency releases and to submit annual information on their hazardous chemical inventory (see the “What Information Do You Have?” section of this factsheet). This information can help the LEPC keep its plan and response procedures up to date.

A Role for Tribes in the CAA Section 112(r) Risk Management Program

Under CAA section 112(r), all chemical facilities with processes exceeding a threshold quantity for 77 acutely toxic substances (such as chlorine and ammonia) and 63 highly volatile flammable substances (when not used as a fuel), must adopt a Risk Management Program. An example of a facility subject to the Risk Management Program requirements would be a drinking water facility holding more than 2,500 pounds of chlorine. All facilities subject to such requirements must submit a summary of the program, known as a risk management plan (RMP) to EPA. The RMP includes:

- The facility hazard assessments, including worst-case release and alternative release scenarios.
- The facility accident prevention activities, such as the use of special safety equipment, employee safety training programs, and process safety hazards analyses conducted by the facility.
- The past chemical accidents at a facility.
- The management system in place at the facility.
- The facility’s emergency response program.

RMPs that have been submitted can be reviewed in a public access database called RMP*Info on the CEPPO web site.

Tribes that EPA finds eligible for treatment in the same manner as a State under the Clean Air Act Tribal Air Rule (40 CFR Part 49) can apply for authorization to administer the RMP program. If the tribe passes its own chemical safety legislation, it should ensure that its program is at least as stringent as the Federal law in order to strengthen enforcement capabilities. For more information on how to receive delegation for your Tribe, see the *Risk Management Programs Under CAA Section 112(r) - Guidance for Implementing Agencies*, available on the CEPPO web site.

What Information Do You Have?

Regulatory requirements, by themselves, do not guarantee safety from chemical accidents. Both EPCRA and the Risk Management Program encourage communication between facilities and the surrounding communities about chemical safety and chemical risk. In this way, accident prevention is focused at the local level where the risk is found. For example, talking with industry about both the quantities of a chemical and a facility’s prevention program allows local emergency officials and the Tribe as a whole to gain a clearer picture of the chemical risks within Indian Country.

Under EPCRA, you receive information from covered facilities on the chemicals they have, the quantities of chemicals stored, the hazards associated with those chemicals, and information on storage locations and conditions.

In addition to the RMP database information, TERCs and LEPCs can access offsite consequence analysis (OCA) information about facilities that have submitted a RMP. A TERC or Tribal LEPC member can receive the information directly from EPA for official use (e.g., to incorporate the information into their emergency preparedness plans). For more information on how to access the OCA information, visit the CEPPO web site.

How Can Tribes Use This Information?

Combining the EPCRA and Risk Management Program information allows Tribes to gain a better understanding of the chemical risks within Indian Country. For example, what precautions are in place to avoid a chemical release? Is a facility near a medical clinic or a highly traveled area? What procedures have been developed to notify and assist the people affected by an accidental release? Has the fire department coordinated with the facility to determine the best response procedures? If the Tribe does not have a fire department, are mutual aid agreements in place with non-Tribal departments? Using the chemical information available to you opens a new avenue of communication between you and the chemical facilities within Indian Country.

These programs also offer Tribes an opportunity to partner with other Tribes, States, and/or towns that border Indian Country. In reviewing your emergency response plan, do you see some sections that need to be updated or otherwise improved? Are there chemical risks in a locality bordering your community that need to be addressed? Some Tribes have developed MOAs and/or mutual aid agreements with their neighbors in order to meet these needs, thereby creating better prevention and response plans.

EPCRA PROVIDES YOUR TRIBE:

Notification from facilities that have extremely hazardous substances (EHSs) in excess of a certain threshold. (EPCRA sections 302 and 303).

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What Else Should Tribes Consider?

Chemical Releases Due to Criminal Actions. TERCs and LEPCs should also address the possibility of deliberate chemical releases in their emergency response plans. For example, accidental releases often occur when illegal drug makers steal anhydrous ammonia to produce methamphetamines. Another possible scenario would be a terrorist incident. TERCs and LEPCs should use already established mechanisms, when applicable, to address these issues rather than creating new organizations. Several sections of a Tribe's response plan, including emergency contact information, response functions, and hazards analysis, should be evaluated to consider the effect of a deliberate release. The EPA Chemical Safety Alerts Anhydrous Ammonia Thefts and LEPCs and Counter-Terrorism provide more information on this topic.

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Available Resources

Chemical Data Sources. These are several websites that provide information to help you implement EPCRA and the CAA Risk Management Program.

- Profiles of the EPCRA extremely hazardous substances are available at: www.epa.gov/ceppo
- Information on accidental releases reported under EPCRA is available in the Emergency Response Notification System (ERNS) at: www.epa.gov/ernsacct/pdf/index.html. MSDSs do not have a standard format and can sometimes be confusing. On-line databases, which often have multiple versions of MSDSs for individual chemicals, can help you find an MSDS that is well organized and easy to read. You can access online copies of MSDSs maintained by universities at www.hazard.com.
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CEPPO has published several guidance documents which may assist TERCs and LEPCs with the Risk Management Program requirements. Following are examples of current guidance documents.

- *RMPs Are on the Way* (EPA 550-B99-003)
- *Risk Management Programs Under CAA Section 112(r) - Guidance for Implementing Agencies* (EPA 550-B98-002)
- *Guidance for Auditing Risk Management Plans/Programs under Clean Air Act Section 112(r)* (EPA550-B99-008)

CEPPO has also published a Chemical Safety Network series, which shares successful practices in RMP implementation, risk communication, and use of the data.

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EPA's Chemical Emergency Preparedness and Prevention (CEPP) Technical Assistance Grants offer funding aid to Tribes in establishing TERCs, in developing emergency plans, and in preparing to integrate accident prevention information into their plans. These activities are related to EPCRA and Section 112(r) of the CAA. To obtain further information on the CEPP grants visit our website at: www.epa.gov/ceppo.

The Department of Transportation's Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and LEPCs for hazmat planning. For more information, visit hazmat.dot.gov/hmep.htm or call 202-366-0001.

FEMA has a grant program to fund six major firefighting preparedness categories: training, wellness and fitness programs, vehicles, firefighting equipment, personal protective equipment, and fire prevention programs. Visit FEMA's web page at www.fema.gov.

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UNDERSTANDING ENVIRONMENTAL HEALTH RISKS AND REDUCING EXPOSURE: Highlights of a Citizen's Guide

HOME

How Can You Find Out Whether Your Environment Is Harmful?

Every day the news media tell us about the harmful effects of hazardous substances in our environment.

For the concerned citizen, these media statements often create more questions than they answer. You may ask these questions:

- How many people are likely to be exposed to hazardous substances, and will these exposures make them sick?
- What is the government doing to reduce my exposure?
- What actions can I take on my own to reduce my exposure?

Scientists have developed ways to assess how many people may be exposed to hazardous substances and their risks from those exposures.

The next pages describe these methods.

Federal and state governments use information about risks to develop regulations for reducing your exposure.

At the community level, both government and nongovernmental programs have been developed to reduce your exposure to hazardous substances.

And, on a personal level, you can change habits to reduce your exposure even more.

This brochure describes community and personal actions to reduce your exposure to hazardous substances.

This flyer should begin to answer your questions about hazardous substances in your environment, but you may want to know more.

EPA has prepared a 125-page guidebook to help people understand environmental risks so they can make informed decisions about their exposure to hazardous substances.

The guidebook also contains a list of government and nongovernmental sources of additional information on hazardous substances.

How Does EPA Estimate Your Exposures to Hazardous Substances?

Hazardous substances come from man-made sources such as commercial facilities that make, treat, store, use, or dispose of hazardous substances; sewage and water treatment plants; and consumer products such as gasoline, household cleaners, pesticides, and paint solvents.

Hazardous substances also can come from natural sources such as naturally occurring minerals or gases and from naturally occurring pesticides in plants used for food.

Hazardous substances can be released routinely, for example, during normal operations of a factory, water-treatment plant, or other government or commercial enterprise and during normal use of a car or a pesticide.

Hazardous substances also can be released accidentally, for example, during fires, explosions, and transportation accidents.

Hazardous substances are transported by many different pathways through the air, water, soil, or food to get to you.

EPA needs to know the identity of a hazardous substance, the type of release, and the pathway to your environment before estimating the concentration of a hazardous substance in your environment.

EPA either measures the concentration directly or uses mathematical models to estimate it.

Because so many substances could be hazardous, however, EPA has done this for only some substances in your environment.

Your exposure depends on how much of a hazardous substance you take into your body when breathing, eating, or drinking.

EPA estimates your exposure by multiplying the concentration of the hazardous substance in your environment by conversion factors for each type of exposure -- such as the amount of water drunk per day.

How Does EPA Estimate Your Risk of Illness?

You already have some risk, or chance, of getting any illness during your lifetime.

Your increased risk of illness is the likelihood that exposure to a hazardous substance will increase your chance of getting that illness.

Some hazardous substances cause harmful effects at smaller exposures than others.

EPA uses dose-response relationships to estimate how much increased exposure to a hazardous substance increases the risks of various illnesses.

Of course, scientists cannot perform experiments on humans.

Some human information is available (for example, for workers exposed to benzene on the job), but scientists usually rely on animal experiments to give information for dose-response relationships.

EPA computes increased risk of illness in terms of the number of extra cases of an Illness expected in a population.

Multiplying the number of extra cases expected for each unit of exposure (estimated using the dose-response relationship) by people's actual exposure gives the number of cases predicted for that population.

Extra Cases of Illness = Cases for Each Unit of Exposure x Exposure

EPA's risk-of-illness estimates are only rough estimates of the human health effects.

This is because scientists lack complete information about human exposures to hazardous substances and about how these substances actually harm human cells.

EPA scientists make adjustments to the risk-of-illness calculations to be sure they do not underestimate the number of illnesses that would occur from an exposure.

That way, regulations that EPA develops based on these estimates provide an extra level of protection of human health.

One way to judge the seriousness of a risk is by the size of your exposure and the associated health risks.

But people also consider other characteristics of the risk such as whether it is voluntary or involuntary.

For example, two risks may be the same size, but you may be more willing to tolerate one because it is associated with an activity you can control (such as your job) versus the other, which is associated with an activity you cannot control (such as a pesticide residue in food).

What Is the Government Doing to Reduce Your Exposure to Hazardous Substances?

In the past two decades, the U.S. Congress has passed many laws to protect the environment and people from exposure to hazardous substances.

EPA administers most laws concerning pollution in the outdoor environment and provides information on pollutants in indoor air.

EPA's responsibilities include

- setting and enforcing standards under environmental laws,
- developing and testing new methods to reduce the sources of environmental risks,
- requiring the cleanup of sites where damage from hazardous substances already has occurred,
- administering programs to provide information to the public and businesses about regulatory requirements, environmental programs, procedures to reduce exposures to hazardous substances, and the health effects of hazardous substances,
- assisting state and local governments in planning for emergencies, and
- coordinating the efforts of local government groups.

To set and enforce standards under environmental laws, EPA uses the information from exposure and risk of illness estimates.

Protecting people and the environment from damage caused by pollution to the air, soil, surface water, and ground water is the major focus of these environmental laws.

They cover sources such as factories, power plants, cars, hazardous waste facilities.

Government actions both provide benefits and impose costs.

For example, people and the environment benefit because the risk of harmful effects is reduced, but regulations can cause increased prices of some goods and services and reduced employment in some industries.

EPA considers these and other benefits and costs when setting standards -- focusing on the environmental problems that pose the most significant and serious risks.

But broader social concerns -- often driven by public perceptions of the seriousness of risks -- also play a role in EPA's decision-making process.

What Is Your Community Doing to Reduce Your Exposure to Hazardous Substances?

One example of what communities are doing is through the Local Emergency Planning Committee (LEPC).

This local group is charged with developing a plan for evacuation or emergency response to an accident involving hazardous substances.

LEPCs were established under federal law in 1986, and there are now about 4,000 LEPCs nationwide. LEPCs include representatives from all parts of the community, including volunteer citizen representatives.

You can volunteer to serve on your community's LEPC.

The chemical industry is actively involved with LEPCs and often provides technical assistance, information, and equipment.

In addition to developing an emergency plan for the community, LEPCs can provide public access to information about

- hazardous substances that are used and stored by facilities in the community,
- accidental releases that have occurred in the community, and
- routine releases that are occurring in the community,

The LEPC's ability to focus community attention on the releases and inventories of chemicals at facilities in the community has forced some facilities to rethink their chemical housekeeping practices.

In addition to your LEPC, other organizations or agencies in your community, such as local environmental and public health agencies, provide helpful services and information.

You and your neighbors can use these resources to organize other activities to reduce hazardous substances in your community.

You might want to organize a household hazardous waste collection program or information programs aimed at problems in your community.

What Can You Do to Reduce Your Exposure to Hazardous Substances?

You can take various actions on your own to reduce your exposure to hazardous substances.

Indoor exposures to radon, asbestos, indoor tobacco smoke, lead in paint, lead in drinking water, and others may pose dangers to you and your family.

Many consumer products such as pesticides which contain hazardous substances.

Select and use these products carefully -- or use less hazardous alternatives.

Read labels and follow instructions for proper use.

If you have an accident with a pesticide or other hazardous substance, consult the label for first aid information.

Then call your local poison control center (get the number from the inside cover of your telephone book) for further instructions.

You also can change habits such as living or working around environmental tobacco smoke, spending time outdoors when air quality is poor, or swimming in or eating fish from contaminated water bodies.

Diet is important for two reasons.

First, removing surface residues from vegetables and trimming the fat from meat and poultry products can reduce your risk of exposure to pesticides.

Second, people who eat healthy diets are less susceptible to harm from hazardous substances.

Summary

Regulatory and other actions by federal, state and local governments reduce your exposure to hazardous substances into the environment.

Through individual and community actions you can do even more to prevent the harmful effects of such exposures.

REPORT OF A CONFERENCE ON RISK COMMUNICATION AND ENVIRONMENTAL MANAGEMENT

HOME

Following for your information is a summary of presentations and a way to access further information from a Risk Communication and Environmental Management Conference held in Philadelphia, Pennsylvania, at Temple University. The conference, sponsored in part by the Environmental Protection Agency's Office of Policy, Planning, and Evaluation, included presentations from leading academic researchers and professionals in the field.

The presentations reflect the opinions and judgments from the “experts" in the field and do not necessarily reflect EPA policy. However, the presenters offered tips and common-sense advice that we think you may find valuable. The presentations have special application to issues involving the implementation of the Emergency Planning and Community Right-to-Know Act (Superfund Amendments and Reauthorization Act of 1986, Title III) at the State and local levels as well as to other environmental issues. EPA thanks Temple University for preparing this conference summary.

COMMUNICATING ABOUT ENVIRONMENTAL RISK

On November 18, 1987, Temple University hosted a conference titled "Risk Communication and Environmental Management." Leading academic researchers, experienced and innovative professionals, and concerned community activists came to Philadelphia for a day of talks and discussion.

They agreed substantially on what were the major problems involved in effective risk communication and how to solve them. This bulletin presents highlights from the conference, and should be useful to those working in this field.

HAVING THE RIGHT ATTITUDE

A pervasive view at the conference was the importance of getting beyond the "rational expert-irrational public" attitude.

Some community activists are technically trained or have become well-informed on specific issues. “Average" members of the public know how and why they feel upset by a situation and this is useful to environmental managers.

All those involved in the risk communication process know some things well, though they may have inadequate or biased views of other things.

Communication breakdowns come from three sources: (1) failure to understand the psychology of individuals, (2) complexities of communicating information about risk, and (3) the nature of institutions in which communication takes place.

1. UNDERSTANDING HUMAN PSYCHOLOGY

A. How people behave:

- People usually process information best when not upset. In a crisis, communication about health hazards is often distorted.
- What upsets people as much as potential hazards is not having any control or input in situations involving them or their families.
- People learn things selectively: they "filter" what they hear based on their experience, information, and interests. For example:
    - Journalists focus on what they feel is controversial, relatively easy to cover, and has appeal to the general public.
    - Community members are most concerned about the well-being of themselves and their families. They often rank issues other than environmental risk as more important to their lives.
    - Risk professionals concentrate on technical estimates of risk, often forgetting that the scientific basis for these estimates may be uncertain and contested.
- Those who must communicate about risk, such as plant managers, are often not trained communicators. Messages get "garbled" and do not come out as intended.

B. How People Estimate Risks:

What average community members see as highly risky is usually different from what poses the greatest actual danger to health.

This happens because some risks trigger strong emotional responses while others don't. Extensive news coverage can stir emotion and enhance the "riskiness" of a given hazard.

- People are more upset by risks which are associated with dramatic events (like accidents in which lots of people are killed at one time), or which they feel result from unfairness or immorality.
- People underestimate risks that are very familiar to them (like driving), or those they have some control over.
- People are more tolerant of a risk (such as air pollution from smokestacks) H they feel they receive some benefit from it (needed jobs).

2. THE COMPLEXITY OF INFORMATION ABOUT RISK

A. Probability of health risks:

Explaining something abstract like "probability," and especially very low probability, is inherently difficult.

Furthermore, a given hazard may have different probabilities of causing harm to different groups of people.

It is the risk communicator's job to explain these probabilities so that the community can make decisions about how environmental protection resources should be allocated.

Tips for the communicator:

- Compare risks people may understand unfamiliar risks by comparing them to ones experienced more often.
- Involve the public right from the beginning in risk assessment and management so they are part of the decision and understand it better.
- Listen to what people say and make them aware of the consequences of choices. This will help produce fairer and more rational decisions.

B. Technical assessment of hazards:

The following guidelines should help the Jay public better understand expert risk assessments and more readily accept management decisions.

- Build trust. People won't believe what you say unless they have confidence in you and your organization. Develop a reputation for openness and honesty within your community long before an important event occurs.
- Be up front. Acknowledge your organization's stake in the issues. Provide all of the information that is asked for and understand that how it is used is up to the community.
- Simplify your language. Use clear, straightforward lay person's language. Most people don't have much scientific training and won't understand technical jargon. Don't use abbreviations, technical terms, and other insider shortcuts in documents handed out to the public.

3. IMPROVING INSTITUTIONS

A. Organizational barriers to effective communication:

- The multiplicity of organizations and local government jurisdictions means that it is difficult to standardize information and develop centralized data-banks.
- Different professional groups, even located in the same organization, will have different interests and attitudes toward a given risk situation. For instance, lawyers tell companies to avoid saying anything that might lead to litigation, and marketing personnel want to block information that might harm sales.
- People who are called on for answers in a crisis situation frequently do not have first-hand knowledge of the technical issues involved and may not have good lines of communication with those who do know.

Barriers such as these are hard to get rid of completely, but awareness can help minimize them. It Is Important for risk professionals to try to give speedy and complete information, develop multiple sources of information for the public, work in inter-disciplinary teams when possible, and be very patient with those seeking information.

B. Building better institutions:

Ultimately, good communication depends on genuine respect and sharing of control between the parties involved. This requires new institutions.

- "Bridging organizations," made up of industry, government, and community members, play a vital role by encouraging open discussion of Issues, preparing unbiased reports, and stimulating action.
- Local Emergency Planning Committees need to involve all the categories of people required by law in the process of emergency planning. Yet most do not fully understand what is expected of them. Industry needs to help in providing key information for plans.
- Complying with the letter and spirit of right-to-know legislation will greatly enhance risk communication but requires some changed practices. Industry must let go of control over information and will have to take the Initiative as bridge-builder with the community. The public must educate themselves on risk choices and alternatives. They must agree on acceptable risk and give up the goal of "zero risk now."

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RISK COMMUNICATION ABOUT CHEMICALS IN YOUR COMMUNITY: A Manual for Local Officials

HOME

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Introduction & Purpose

"STATE RATES HIGH IN CANCER RISK FROM FACILITY EMISSIONS"
"PLANT CHEMICAL SPILL FORCES HUNDREDS TO EVACUATE"

Have you seen headlines like these recently? Do they raise questions in your mind? If someone asked you about them, could you answer the questions?

People are becoming more concerned about hazardous materials in their communities and how these materials affect their health and well-being. Their concerns become most pressing when there is an accident or a leaking waste site is discovered, but they are also concerned about hazardous chemicals they are exposed to every day. In response to these concerns, local officials are increasingly called upon to respond to questions about hazardous materials, including the risks they pose and how to reduce those risks. For many local officials this is a new role, one for which they may not be fully prepared.

Purpose

This workshop manual will help you learn how to respond to public questions about chi3mical risks. It also will help you find additional assistance and information about hazardous materials.

Recent federal legislation is likely to increase public awareness and concern especially because of the Emergency Planning and Community Right-to-Know Act, which is Title Ill of the 1986 amendments to the "Superfund" Act.

Title Ill is not a typical regulatory program; it is part of an innovative approach to managing environmental risk. It makes a great deal of information available that has never been provided before.

The information is available to everyone -- to the public and to governments at all levels -- about the presence of hazardous chemicals in the community, about accidental and routine releases of these chemicals, and about their storage.

The more citizens know about chemical hazards in their communities, the better equipped they and their local governments will be to make decisions and to take actions that will protect their families and neighbors from unacceptable risks.

The new information available under Title Ill is often complex, and its application and interpretation requires work from all those involved. It will cause citizens' existing concerns about hazardous chemicals to become more focused, and public officials will need to respond to these concerns. Title Ill establishes an ongoing forum at the local level for community discussion and action about hazardous chemicals. This forum is the Local Emergency Planning Committee, or LEPC.

LEPC members may be called upon to respond to public questions about the risks they are examining or to participate in public meetings about those risks-meetings where people will ask what the information means or about its significance for a particular person or segment of the community.

If you are a member of the LEPC or participate in its work, you will be interacting with the community as you work to analyze and mitigate potential chemical hazards.

Since LEPC membership by law includes a variety of categories--emergency responders such as firefighters and police, health professionals, the media, industry representatives, transportation representatives, and public interest groups-many different kinds of people with many different backgrounds will find themselves answering public questions.

This manual is intended to help everyone who may have to answer questions develop some useful strategies.

Preview

The manual begins with a brief overview of the law and local responsibilities.

To illustrate situations and suggest ways to respond, we will look at three kinds of incidents that cause citizens to seek out local officials.

We will begin with an accident, then expand our discussion to include more routine events.

These are not the only circumstances under which citizens may seek out local officials and become involved in considerations of risk in the community, but they illustrate ways in which public officials might interact with the public.

How to Use This Manual

The manual can be used in three ways: first, as part of a workshop on answering citizen questions about hazardous chemicals; second, as a stand-alone guide for local officials unable to attend a workshop; and third, as a reference.

Objectives

Reading or using the manual will help you:

- Know what kinds of questions citizens are likely to ask
  - o after an accident
  - o after learning about routine releases
  - o after learning that large quantities of substances are stored nearby.
- Know the characteristics of a good answer to these questions.
- Understand the kinds of information needed to answer the questions and where that information may be found.
- Respond to the questions and identify some people in the community who can help answer them.
- Identify opportunities for all sectors of the community to participate in decision-making about potential risks from hazardous chemicals.

How the Manual is Organized

The manual is written so that later topics build on material presented earlier.

Those using the manual for self-study will need to identify the local and state resources described in this manual.

Resource Guide

This manual should be maintained as a resource guide. The materials are arranged so that specific information can be found easily when needed.

Specific times to review this manual would be when an accident or a spill happens, when companies submit their required Title Ill reports on hazardous chemicals, or when the public or the media has concerns or questions to be answered.

Remember, there are many other resources available to help you respond to risk assessment questions and accidents, and the early identification of these resources will help you fulfill your official obligations in a safe and responsible manner.

Introduction to Title Ill

The Emergency Planning and Community Right to Know Act was included as the third part or title of the Superfund Amendments and Reauthorization Act of 1986. For this reason, it is often called ''Title Ill." The law has four purposes (readers should not use the following brief descriptions as the basis for legal decisions about Title III):

1) Emergency planning. Facilities that store or use any of the 366 Extremely Hazardous Substances in excess of the threshold planning quantity (TPQ) report this fact to the State Emergency Response Commission (SERC) and LEPC. The LEPC develops an emergency plan based on this and other information.
2) Emergency release reporting. Facilities must report to the SERC and LEPC accidental releases in amounts over a reportable quantity of the Extremely Hazardous Substances and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances (which must also be reported to the National Response Center).
3) Hazardous chemical reporting. Facilities where any hazardous chemicals are present in amounts over certain reporting thresholds (often 10,000 pounds) must submit Material Safety Data Sheets (MSDSs) or a list of chemicals for which MSDSs are required as well as an annual chemical inventory form to the local fire department, LEPC, and SERC.
4) Creation of an emissions inventory. Manufacturing facilities that use any of a different list of about 300 chemicals in excess of reporting thresholds must report emissions to EPA and designated state agencies.

As indicated, different sections of the law apply to different facilities and different chemicals.

Specific sections are listed in Appendix 3.

In order for the law to work, industry, interested citizens, environmental and other public-interest organizations, and governments at all levels must work together to plan for chemical accidents and to reduce the risk to the public from releases of toxic chemicals into the environment.

The law represents a path-breaking approach to environmental protection, because it assumes that the more citizens know about chemical hazards in their communities, the better equipped they and their communities will be to make decisions and take actions to protect their families and neighbors from risks they feel are unacceptable.

Special Provisions for Local Government Officials

Provisions of special ce1ncern to local officials include:

- The law required states to set up State Emergency Response Commissions, or SERCs.
- SERCs were then required to establish local emergency planning districts and Local Emergency Planning Committees, or LEPCs.
- LEPCs must include among their members local elected officials and staff with competence in health and emergency response, industry representatives, media representatives, and members of citizens groups.
- Facilities having more than certain quantities of any of the 366 Extremely Hazardous Substances must make themselves known to SERCs and participate in the LEPC.
- As noted, facilities wh43re hazardous chemicals are present in certain quantities must submit MSDSs and inventories of the chemicals to SERCs, LEPCs and local fire departments. An MSDS describes the physical and chemical properties of the substance as well as its health effects, appropriate safety equipment, and eme1rgency response measures.

- LEPCs must make the chemical inventories and the MSDSs available to citizens who want to see them.
- LEPCs must develop a plan for responding to and avoiding emergencies involving hazardous chemicals, drawing upon the chemical inventories and other information provided by facilities.
- Manufacturers must report their annual emissions of certain toxic chemicals into the air, water, or land. The reports are sent to the federal Environmental Protection Agency (EPA) and to the designated state agencies. Citizens also have access to these reports.

The information now available to citizens under Title Ill is one of the driving forces for citizen questions about hazardous materials in the community. Sections below describe three scenarios in which citizens have obtained Title Ill information.

Defining Terms

Title Ill makes use of three terms that often seem similar. They are:

- Toxic - substances that are poisonous or can cause adverse health effects. These are the substances emissions of which are reported under Section 313 of Title Ill.
- Hazardous - substances that are toxic, corrosive, flammable, or explosive. This is a general term, not specific to Title Ill.
- Extremely hazardous - a set of chemicals defined by Title Ill as subject to reporting under Section 302, because they could cause death or irreversible damage after relatively short exposure to small amounts, generally in air.

As you talk with citizens, it is important to remember that they may not know the differences among these terms as well as you do. Listen to understand what they mean instead of concentrating on the particular terms they might use.

We know that citizens are often very concerned about toxic and hazardous chemicals in all these categories. Title Ill offers an important new step forward in allowing and encouraging citizens, working with government and industry, to participate in managing these chemicals in their own communities.

What is Risk?

"Risk" is a word that is used often when people talk about hazardous chemicals in the community.

What is risk? A convenient definition is:

> The likelihood of injury, disease, or death.

Environmental risk then refers to

> The likelihood of injury, disease, or death resulting from human exposure to a potential environmental hazard.

(In addition to human health, the environment itself may also be at risk. We will not mention these risks below, but the considerations are the same.)

Common Risk Characterizations

Experts often use the definitions above. When experts are asked to describe or characterize a risk, they use statements like these:

- There is a lifetime risk of 1 in 65 of dying in a motor vehicle accident.
- The range of risks in humans is between 100 and 1000 cancers per 1,000,000 people exposed.
- The chance of getting this disease is 1 x 10-7 (1 10-millionth, or 1 in 10 million)
- The risk to children is high relative to that for adults.
- 25,000 people die each year from at-home injuries.
- The risk of death from leukemia is 1 in 12,500 people per year.
- The risk of cancer from indoor air is 600 times the risk from tap water
- An airplane crash involving 100 or more deaths is likely to occur once in two years.
- The risk to this neighborhood from chemical releases at Facility A is likely to be higher than the risk to a different neighborhood from releases at Facility A.
- The risk of neighbors getting sick is higher with this waste disposal site here than it would be if the waste were not disposed here.

Experts tend to focus on the likelihood of a particular risk, but non-experts tend to think of other characteristics of the risk.

For example, an industry representative at a public meeting about a proposed new incinerator reported that a person who spent her whole life downwind of the incinerator would incur a risk that was smaller than the risk from dying her hair.

A member of the audience stood up to say, "Yes, but I choose to dye my hair, while I don't choose to live downwind of the incinerator, and furthermore, I get some benefit from dying my hair, while I get none at all from the incinerator." This woman was reacting to the involuntary nature of the risk and the perceived balance between risks and benefits.

Table 1 on the next page illustrates some of the other features of risk that make it seem "riskier'' to most people and gives brief examples.

Table 1: Characteristics of Risk (Factors on Right Increase Perception of Riskiness)	
• Voluntary Driving a car	• Involuntary Breathing air polluted by a neighboring factory
• Natural Radon in basement	• Man Made Industrial chemicals
• Familiar Household cleansers	• Exotic Genetically engineered organism
• Chronic Routine small releases of chemicals from facility	• Catastrophic Large accidental release of chlorine gas from a plant
• Visible Benefits Dying hair	• No Visible Benefits Incinerator effluents
• Controlled by Individuals Driving	• Controlled by Others Industrial pollution
• Fair	• Unfair

The notion of ''fairness" sums up many of the other aspects of risk that make people fe1el special concern or "outrage." If a person or community feels that it is bearing a lot of risk while someone else is getting most of the benefits, then the risk will seem especially unacceptable. Risk communicators must understand these feelings, or they will not succeed in working with the community to make good .decisions about risk reduction.

We also know that most people seek information about hazardous chemicals only when something happens to make them interested or cause them to believe that they are directly affected.

Scenario 1: Unplanned Release of a Chemical

Questions citizens ask about hazardous materials

We will use as examples three kinds of circumstances that may cause citizens to become concerned enough about hazardous chemicals in their communities to ask questions: during/after an incident, when they learn about routine releases, and when they learn about the many kinds of substances stored nearby. Most questions will concern human health, but many citizens also will ask questions about environmental and other possible effects of chemical exposure or release. In addition to these substantive questions about health or the environment, citizens also ask many "procedural" questions about where they can obtain additional information, why it was so difficult to get answers to their questions, or how they can get involved in making sure risks are managed properly.

Few public officials will be able to answer all these questions. Some questions have no sure answers, and others can be answered only in light of the particular conditions prevailing in the community. However, this manual is intended to help users understand the kinds of answers that are appropriate and find sources for the factual information that is available. Keep these questions in mind as you think about the scenarios from the perspectives of government, industry, or citizen representatives

Scenario 1: Unplanned Release of a Chemical

About 2:30 on a weekday afternoon you receive a telephone call from the Director of Emergency Management telling you that a chlorine tank in the basement of the local school has sprung a leak and that the gas, which is very dangerous, has entered the indoor swimming pool area and gym and is being sucked into the school's air circulation system. The tank has been removed from the basement to the open air and the leak is being repaired; emergency personnel are moving rapidly through the school to locate and rescue students and teachers; local hospitals have been notified; and vehicles are on their way to the school to transport anyone suffering impaired breathing.

Within fifteen minutes, your telephone starts ringing with questions from frantic parents and the media. What should you say to them? As an LEPC member, you would refer calls to the appropriate emergency response public contact. But what if you are that person? Or what if you have to answer "spillover" questions because you are on the LEPC or in another position in which people are likely to call you?

Procedures with Hazardous Chemicals

To answer people's questions, you must first know about the plans and procedures for emergencies involving hazardous chemicals.

1. SARA Title Ill requires any facility that stores any of 366 Extremely Hazardous Substances in amounts greater than specified Threshold Planning Quantities to notify the Local Emergency Planning Committee (LEPC) and the SERC. (Many of these substances are also covered by the annual toxic chemical reporting requirements of Title Ill). A list of the Extremely Hazardous Substances appears in Appendix 5.

2. The LEPC uses this information to plan for accident prevention and for emergency response in case of an accident. Individual facilities also should have their own emergency response plans.

   For some chemicals, including chlorine, there are professional standards for the kinds of emergency warning systems and emergency equipment that should be on hand. The local emergency plan developed by the LEPC should:

Some Steps in the Emergency Plan

- Designate a coordinator for emergencies -- usually the Director of Emergency Management or someone in the Fire Department. (Note that many states have rules about first responders that should have been considered as the plan was developed.)
- Provide a means for notifying appropriate authorities.
- Provide a means for emergency responders to obtain information about appropriate responses particular to specific chemicals involved in the incident (including needs for special equipment and clothing).
- Identify sources of necessary equipment and trained personnel and describe procedures for bringing them to the site.
- Specify the division of duties between the public and private sector response personnel. (Many companies insist on deploying their own specially-trained staff for accidents that do not cross the plant boundary, in part to limit possible liability for damages to non-employee emergency responders).

(Although cities or other jurisdictions smaller than the area covered by the LEPC could have their own plans; in this manual we focus on the LEPC plan. The planning principles would be the same for the smaller jurisdictions.)

Citizens' Questions

In the chlorine spill, the plan has worked quite well. Authorities, including you, have been notified, equipment mobilized, and the problem treated. Your callers ask:

a. What's going on?
b. Am I at risk?
c. Should I evacuate?
d. What are you doing to mitigate the consequences?

Although citizens will call the elected official, he is not necessarily the best person to provide answers. The person designated as emergency coordinator should in turn have designated a particular person or position in his office to be the contact for non-emergency personnel who have questions. This person's name and especially phone number should be emphasized to the media before any accidents occur. (Many facilities are designating a particular contact person and inviting the media to meet with that person on an informal basis independent of any particular events. Public agencies could adopt this approach, ensuring that the media are aware of procedures and plans.) The elected official should refer almost all calls to the appropriate contact person, since during an emergency, it is often impossible to ensure that every office is kept up to date on rapidly changing events.

Where to Get Information to Answer These Questions

Local officials should know about the system in place in their own communities for emergency planning and response and be prepared to talk about it with the public. You should know the answers to these questions:

a. Who is the central contact person or where information will be available?
b. b. Which departments, programs, or offices are responsible for emergency response?
c. Who has authority' to direct citizens to evacuate or take other action?
d. What is their relationship to the Local Emergency Planning Committee (LEPC)? Who is chairman of the LEPC and what is the role of the LEPC during an emergency?
e. What are other sources of information to answer citizens' questions?

In short, officials need to be familiar enough with local procedures to be able to tell callers where to find the information they need right away. It is important to identify the LEPC and local emergency coordinators in advance. (The State Emergency Response Commission is a resource that should be used during the planning period and not during an emergency -- see Appendix 4.)

Questions after the Event

Another series of questions will arise after the event. Among the most likely to be asked are:

a. How did this happen?
b. How long will the "short term" health effects (those that show up within a few weeks of the incident) continue to be felt?
c. Will we have other health effects that do not show up for a long time?
d. What are you doing to prevent it from happening again?

Of course, the answers differ for each incident. [Appendix 2 lists some sources for information about specific chemicals.] In answering what is being done to prevent a similar accident from occurring, officials may need to refer to state and local laws that give them power to prevent accidents, such as inspections for enforcing the building code.

For this incident, an official might issue a statement something like this:

Sample News Release
News Release: For release, Tuesday 9:00 AM. Office of the Mayor.

About 100 pounds of chlorine gas were accidentally released in the basement of North High yesterday when a storage tank began to leak during routine transfer of chlorine to the pool-cleaning system. The gas was sucked into the air circulation system of the school, which was turned off five minutes after the leak was detected. All 1100 people in the building were outside within fifteen minutes. Although some people experienced difficulty in breathing for several hours, and twenty people were treated at the hospital, no one was admitted and no one is experiencing after effects now.

Chlorine can affect human health in two ways. In high concentrations that may be present during accidents, it causes difficulty in breathing, choking, coughing, chest pain, and sometimes nausea and vomiting. It also reacts with moisture, including body moisture, to form acids that are very irritating to skin, eyes, and mucous membranes. In yesterday's incident, no one suffered any skin irritation because concentrations except in the basement were not high enough. Once the symptoms of chest tightness or difficulty in breathing have disappeared, there are no further health problems that we are aware of associated with an exposure to chlorine.

Our city has a plan in place for responding to emergencies involving hazardous chemicals. This plan worked well, with efficient and effective response by the Fire, Emergency Management, and Volunteer Rescue teams, although the first person calling to report the accident had some trouble finding the right telephone number and right place to report. The city has had a plan since 1973, but it has been revised and updated recently by the Local Emergency Planning Committee. This committee was established under a federal law that calls for emergency planning and public access to data about hazardous chemicals.

In order to limit the likelihood that any further such incidents will occur, the School Board has agreed that transfer of chlorine will no longer be done during school hours. Chlorine is also stored in large quantities at city swimming pools and water and wastewater treatment plants. We have reviewed our systems for detecting leaks and made sure they are all working properly. We have also issued instructions that transfers of chlorine at city pools will only occur when the pools are closed for the day and will be made only by trained personnel.

Finally, we have tried to publicize the telephone number to which initial accident reports should be made: it is 333-3333.

Characteristics of a good answer

To prepare a good answer:

- describe the incident, the response, and other events
- describe the chemical itself, including short- and long-term health effects of brief exposure at relatively high levels
- describe the health effects suffered in the incident and any longer-term concerns;
- summarize the good and bad points of the response
- describe actions being taken to reduce the likelihood of a similar incident

There are a variety of sources of information about chemicals, including their physical properties and possible health effects.

Some of these sources are listed in Appendix 2. Many public libraries and local emergency response departments have reference books that provide some of this information.

The Material Safety Data Sheets (MSDSs) that facilities must supply to the LEPC on request also contain this information.

EPA and several private companies maintain computerized databases with chemical information. CAMEO™, a computer program developed with assistance from EPA, contains information about more than 2700 chemicals.

The National Library of Medicine has toxicological information in computer databases called TOXNET.

These sources seldom contain any information about long-term health effects of exposures that may occur during an accident, because it is often the case that little is known about them.

Summary

Citizens' concerns about an accidental release of a chemical focus first on response to the emergency.

Later, citizens want to know what is being done to prevent a similar emergency from arising again, and they want to know more details about the health effects of exposure to the chemicals involved in the accident.

Prior to any incidents, local officials should ensure that

- a plan has been developed,
- a central source of information for the public has been designated,
- they are aware of the procedures to be followed during an emergency. (Filling out the Risk Communication Resource Sheet at the beginning of the manual will help meet this guideline.)

After incidents, local officials should be prepared to

- provide an evaluation of the effectiveness of the plan
- provide available information about health effects of the chemical
- provide information about how citizens can become involved in emergency planning and risk reduction through the LEPC.

Scenario 2: Routine Releases

Learning about Routine Releases

As a result of the incident in scenario 1, the local media become very interested in the hazardous chemicals in the community. They obtain emissions reports from the state agency assigned the responsibility of keeping them or from EPA, which maintains the Toxic Release Inventory (TRI) database. The TRI can be accessed through the National Library of Medicine's TOXNET system. The following newspaper article is an example of the kinds of information being publicized.

Ourcity Daily News

325,000 Pounds of Four Toxic Chemicals Emitted Locally
Benzene, Chlorine, Pyridine, Ammonia Most Prominent
Industry Says, "Risk is Low"

Last year, fifteen local manufacturing facilities emitted more than 10,000 tons of toxic chemicals into the air, water, and land of Ourcity. The top chemicals emitted (in pounds) were benzene (200,000), chlorine (100,000), pyridine (10,000) and ammonia (15,000).

Benzene is a known carcinogen. Chlorine is a highly toxic chemical that may cause severe respiratory problems. Chlorine was involved in the recent accident at the North High School, causing evacuation of 1,100 students and teachers. Pyridine is a reproductive toxin, causing possible damage to reproductive organs, as well as having serious effects on the central nervous system. Ammonia, a common household cleaner, is irritating to eyes and the respiratory system.

Newspaper staff examined reports submitted by fifteen local manufacturing facilities under the requirements of a federal law, the Emergency Planning and Community Right to Know Act. The federal Environmental Protection Agency requires facilities to disclose the amount of toxic chemicals they release into the environment each year.

In addition to benzene, chlorine, pyridine, and ammonia, local facilities emit more than 500,0CIO pounds per year of ethylene, creosols, formaldehyde, and twelve other chemicals.

Tom Jones, senior safety engineer for Newtown Chemical Company, noted that the emissions reported do not give cause for any alarm. Benzene emissions by all fifteen companies, he said, are only one-tenth of the benzene given off by automobiles in Ourcity.

Jones also pointed to a recent study by the State Environmental Department which showed that total concentrations of benzene and seven other chemicals in Ourcity are well below state standards. In Ourcity, they have been measured at about 20 parts per billion at the intersection of Broad and Main Streets.

Rodney Smith of the State Environmental Department stated that the department will be looking more closely at the emissions to see whether they violate any state standards.

"For now," he said, ''we are just happy to see the companies providing the reports, complying with the law. Later we will use the data to examine whether we need regulatory changes."

After reading such a news article, the questions that people are likely to ask local officials include:

1) What risk is posed by these exposures?
2) Are these emissions the cause of (various health symptoms)?
3) Why are the plants allowed to emit these substances?
4) Was the facility in compliance with state and federal laws?
5) Are there other facilities in the area that have not reported that also are emitting these substances? Should they be reporting too?
6) What other sources might lead to my being exposed to these chemicals?

Emissions vs. Exposure

To answer the first two questions, we need to know about

- emissions, concentration, exposure, and dose
- toxicity
- acute, high-level vs. long-term, low-level exposures
- immediate vs. delayed risks

To answer questions 3 and 4, officials should know a little about the present system for regulating emissions, the procedures for getting information under Title Ill, and how citizens can begin to work with industry to reduce emissions if that is what they want to do.

An emission or release is the amount of a substance released from a facility.

Releases are usually classified either as routine -- small regularly released amounts that are planned to be released as part of a manufacturing process -- or as accidental.

Just because a facility emits some amount of a substance does not mean that it affects anyone.

Substances are diluted as they are released into the air and water.

The concentration is the amount of the substance in a representative unit of the air, water, or land. For example, due to automobile exhaust, benzene may be found in the air of many cities in a concentration of about 8 parts per billion.

The concentration is, of course, higher if emissions within a fixed time are higher and other conditions remain the same. Concentrations also will tend to be higher closer to the emission source.

Exposure happens when an individual comes in contact with a substance.

Exposure can occur through breathing, drinking, eating, and by direct skin contact.

The amount of exposure is determined by many factors, including the concentration of the substance in the environment, how long the contact lasts, and how often the exposure occurs.

At each point, there are difficulties in determining how much a person is exposed. This makes it hard to estimate the risk.

Dose is the amount of the substance that actually enters the body.

The dose is related to exposure, but differs according to individual susceptibilities and habits.

The dose received from a hazardous chemical in the environment is influenced by the concentration, route of e1ntry, length of exposure, presence of other chemicals, and the ability of the body to break down the substance.

Characteristics of the chemical

Toxicity is a measure of how harmful a substance is to human health or to plants or animals. Highly toxic substances have adverse health effects at smaller doses.

An acute exposure is one that occurs over a short period of time. It could be a large' exposure such as might occur during an accidental spill.

Long-term exposure can occur when a substance is present in the environment over an extended period.

Acute or short-term exposures may have immediate or acute effects and may have long-term effects.

The immediate effect of the chlorine was to cause people to gasp and choke.

We do not know about any delayed effects of acute exposures to chlorine.

Long-term, low level exposures also may cause health effects.

Usually these are delayed health effects that may not show up for many years. Cancer and birth defects are often delayed health effects.

Determining delayed health effects

The ways in which we learn about delayed health effects make it difficult to discuss them with any certainty.

Most of our information about delayed health effects comes from laboratory studies conducted on test animals. Usually more than one species is used. Animals are exposed to the substance in different ways, including eating, drinking, breathing, or on the skin, and different groups are exposed to different quantities.

After some time, animals are examined to see whether there are abnormal cells or other evidence of harm. The number of these abnormalities in the test animals is compared to that in unexposed control animals.

Statistical tests are used to determine whether the difference between the test animals and the controls is "significant," or suggests that the substance may have a health effect.

Many people disregard laboratory studies because animals are exposed to quantities of the substance that are so much higher than humans ever would receive.

Laboratory studies are done this way in order to reduce the number of test animals used and the time needed for the study; otherwise, studies would be prohibitively expensive.

Results from the high doses are used to predict what would happen at more realistic doses.

These results may tell us approximately how many people will get sick or die from particular exposure levels, but they can never tell us which people will be affected.

Some laboratory studies are conducted on tiny organisms in test tubes. Scientists have learned that substances that affect the growth of these organisms often have adverse human health effects.

Usually these "in vitro" ("in glass") studies are used to screen chemicals; those that seem suspicious are further tested on animals ("in vivo").

Epidemiological studies use data about humans who have been exposed to a substance and data about their health to try to determine whether a substance causes health problems.

Such studies are often difficult to interpret because people are exposed to so many substances throughout their lives and because the health effects of interest may not occur for many years.

Combined with laboratory evidence, however, it is often possible to show that certain exposures cause unwanted health effects in humans.

Because the evidence about long-term effects, when it is available at all, is based on laboratory and/or epidemiological studies it is often open to different interpretations.

There is never full proof about the cause of such effects. This may create political controversy between people who believe the chemical creates a risk for those exposed and those who believe that the evidence is not good enough to suggest that there is a risk.

Citizens who want to discuss these questions should be referred to appropriate experts.

Officials should try not to get caught in such arguments. Instead, they should try to present whatever facts are available and provide ways for opponents to work together to achieve acceptable policy solutions.

Answering health effects questions

Now we can turn back to some of the questions citizens ask:

1) What risk is posed by these exposures?
2) Are these emissions the cause of (various health symptoms)?

1) What risk is posed by these exposures?

The word "risk" often carries different meanings for different people.

In communicating with the public, it is usually not helpful to say, ''the risk is high" or ''the risk is low."

The factors contributing to the risk include:

Factor	Example
Quantities	How much effluent was released
Concentrations	Parts per million
Exposures	How much is likely to be absorbed, inhaled, drunk
Probabilities	How likely is it to happen
Risk levels	Expected number of deaths or disease per year
Toxicity	How strong is the effect of exposure on human health

(Adapted from Hance, ChE1ss, and Sandman, "Improving Dialogue With Communities" p. 64.)

In answering questions, people often confuse these factors when attempting to put risks into context.

In addition to these risk factors, other characteristics we have noted affect people's perceptions of risk, including how fair the risk seems to be, who benefits and who bears the risk, and whether the risk is voluntary or easy to understand.

One way to talk about risks of exposures is to provide:

1) A description of known health effects.
2) Any information~ about concentrations or levels of exposure.
3) Any comparisons of these concentrations with existing government standards or other directly comparable information.

   (Caution: Be careful when providing comparisons with risks from other chemicals or activities. For example, avoid making comparisons between risks such as drinking water containing hazardous chemicals and the risk of driving an automobile.

   Comparing dissimilar risks often makes citizens angry, especially when the comparison is between an involuntary risk such as drinking water containing hazardous chemicals emitted by a facility and a voluntary risk such as driving.

   However, people might find it useful to hear a comparison of similar risks of two chemicals, both of which are found in drinking water. The Covello, Sandman, and Slavic book mentioned in Appendix 2 gives other good examples.)
4) In addition, people like to know why the chemical is present in the community-that is, what it is being used for. Remember, familiar risks are likely to be perceived as less risky than unfamiliar or exotic ones. The multi-syllabic name of a chemical, in contrast, might increase concern.

A public official confronted with questions about benzene emissions might state the following:

"Benzene is a chemical found in many common products such as gasoline and often used in making plastics, textiles, rubber, and solvents.

It is known to cause leukemia if people are exposed to it at levels of hundreds of parts per million over many years. In our town, concentrations in the air are about 20 parts per billion.

Because this is about 400 times lower than exposures known to cause leukemia, scientists do not know what kinds of health effects might result from exposures at this level. In other cities that do not have factories emitting benzene, concentrations in the air average about 9 parts per billion, because both automobile exhaust and other everyday activities such as pumping gasoline result in benzene emissions too."

For a substance with less well-documented effects, a statement might include the following:

'We have recently found trichloroethylene (TCE} is a chemical that is emitted by local facilities into the water.

TCE is used by these facilities as a solvent and a compound in cleaning fluid and typewriter correction fluid.

In some laboratory tests on mice, TCE has been shown to have reproductive effects at levels hundreds of times higher than the levels found in our drinking water. We just do not know what effects exposure at lower levels may have.''

2) Are these emissions the cause of my unwanted health effects?

Causation is the most difficult question officials are called upon to consider. Except in well-conducted laboratory experiments, causation is almost impossible to prove.

Workers who develop certain rare diseases after being exposed to relatively high concentrations of workplace substances known to be associated with those diseases can reasonably say that workplace exposure caused their problem.

Otherwise, it is almost impossible, since people are exposed to so many different substances in so many different ways.

Again, laboratory studies suggest the rate at which people will experience the unwanted health effects, but can never tell which individuals will get sick.

Other Sources for Referral

Local officials should know how to get more information, including specialists to whom they can refer these more specific questions.

- Several books are available in most public libraries. Among them is the Concise Chemical Dictionary. Appendix 2 lists some others.
- Local health department officials may not have the necessary expertise but will know appropriate health officials at the state level.
- Local universities have professors who are familiar with the issues surrounding identification of long-term health risks.

Technical experts often anger people by emphasizing the difficulties in establishing causation or the extent of scientific uncertainty.

Nevertheless, policy or legal decisions must often be made even when these uncertainties exist.

Sometimes it is useful to respond to questions about individual symptoms and emissions or exposures with four kinds of statements:

Additional Responses

- Our scientific knowledge is not good enough for us to say whether these exposures cause your symptoms.
- You can try to reduce the exposures by ... (give specific relevant directions such as drinking bottled water, keeping windows closed, etc.)
- (If appropriate) Emissions constitute only a small portion of most people's exposures.
- You have an opportunity to work with industry to reduce these emissions through the LEPC.

How Safe Am I?

Perhaps the most common question asked is some form of:

How safe am I?

As noted, individual exposures differ and individual ·susceptibilities also differ.

More important, individuals' willingness to assume risks differ widely. In other words, safety is a relative term.

This is especially true when we consider the non-quantitative aspects of risk, such as perceived fairness or controllability.

Local officials can provide information about risk measurement, but each person must decide for himself or herself whether a risk is acceptable -- that is, whether something seems "safe."

Without supplementary information, the emissions data available under section 313 of Title Ill cannot answer questions about safety.

The data can help people choose the facilities, media (air, water, land), or chemicals about which they would like to know more, however.

Among the other information that would help determine whether the present level of safety is adequate (or the present level of risk is low enough) are the following things that affect the dose received, stack height, wind velocity, temperature, known health effects, concentrations at the fence-line, and the nature of the dose-response curve.

Perhaps the most important thing to remember is that because safety is a relative term, community members must be involved in decisions about the levels of safety they would like.

One important feature of Title Ill is that it provides people with initial information to allow them to participate in such decisions, especially through the LEPC.

One other way a local official can help people make a determination about safety or acceptable risk is by "answering" as a citizen rather than as an official, describing how he or she would act or is acting:

"I drink the water'', or "I let my children play outside."

An answer such as this is more effective when it includes a recognition of people's feelings:

"I can see that you are very concerned about this. What are your concerns and questions?"

Other questions about Scenario 2

In addition to questions about risk and safety, the newspaper article about emissions data is likely to elicit questions about existing government programs and enforcement:

3) Why are the plants allowed to emit these substances?
4) Is this facility in compliance with state or federal laws.
5) Are there other facilities in the area that have not reported that are also emitting these substances?

To answer question 3, we need to know about the present system for regulating emissions. Answering questions 4 and 5 requires obtaining and analyzing new information.

Present System for Regulating Emissions

The Present System for Regulating Emissions

It is difficult to answer the question about why plants are allowed to emit hazardous substances because of the intricacies of the federal and state laws regulating toxic chemicals.

Although the emissions of many chemicals are indirectly controlled by air, water, or land disposal regulations, few are subject directly to specific federal emission permits or standards.

Most EPA regulations deal with ambient levels of chemicals (in other words, they specify acc1eptable concentrations in the community's air or drinking water -- not the amounts of the chemicals that can be released from a particular facility)

Where EPA does have regulations based on emissions, they generally apply to classes of chemicals (volatile organic compounds and particulate matter in the case of air; total suspended solids and certain types of waste streams for water).

And in the handful of cases where EPA has established emission permits or standards for specific chemicals, they apply only to certain industries - not to all companies emitting those chemicals.

For example, EPA has established a national air emission standard, or NESHAP, for benzene; but it applies only to certain industries and to certain processes within those industries.

Therefore, to determine whether a particular company is complying with the benzene standard, you would need to know first, if the company is among the industries subject to the standard; second, which of its processes are regulated; and third, what percentage of the reported releases are emitted from those processes.

Citizens may ask whether all the emissions have been reported.

The answer is no. Some facilities are not covered by the requirements of Title Ill; others may not know that they need to report; and still others may have decided not to do so.

Additionally, not all substances are covered - only those on the Section 313 list (see Appendix 5.)

In short, the data provided by Title Ill, although better than anything we have had before, are still very limited.

However, this question offers a good reason to discuss the opportunities for citizens to become involved in Title Ill activities.

Enforcement and Citizen Involvement Under Title Ill

Title Ill provides penalties for not submitting reports of routine releases.

Facilities that do not submit may be sued by citizens and fined by EPA.

In the many states that have passed their own right to know and chemical reporting laws, state agencies may also be able to obtain penalties for non-reporting. It may be difficult for states to determine that a facility has not reported, however.

Local residents often have access to information that regulatory agencies do not have, so citizens may be able to help enforcement officials identify facilities that have failed to report.

Citizens who suspect that a facility is not reporting all or any of its emissions might begin by obtaining the chemical inventory lists available under Title Ill sections 311 and 312, and comparing those lists with the lists of chemicals reported as emissions on the section 313 report.

Just because a chemical appears on the inventory does not mean it is emitted, so citizens will have to work with industry, local officials, and experts to determine whether it is likely that a substance is being emitted.

It is also important to recognize that the first emissions reports were due on July 1, 1988.

Not every facility that should have reported even knew of its responsibility.

Local officials and citizens can help identify facilities that are covered by the law and encourage them to report and notify state and EPA officials.

One answer to question 3 -- 'Why are the plants allowed to emit these substances?" is

> "Not all emissions of toxic substances are harmful. Usually environmental or human health problems arise when the substance is present at more than a particular concentration.
>
> Government regulations are formulated to keep the concentrations at levels that evidence suggests are consistent with environmental and human well-being. If regulations made all emissions illegal, little manufacturing could take place.
>
> If new information becomes available that suggests that the existing standard is wrong or that some substance for which there is no standard should have one, regulatory agencies try to write new standards.
>
> Under Title Ill, citizens and regulatory agencies are learning about emissions they may not have known about before.
>
> This will provide a better basis for appropriate policy responses.
>
> Because the information is also available to citizens, they have an opportunity to participate in policymaking concerning emissions to a greater extent than before.
>
> One way they can participate is by becoming active in the Local Emergency Planning Committee."

To answer question 4 -- Is a particular facility in compliance with state and federal laws? will require review of reports filed by the facility with EPA or the appropriate state agency.

Local officials can provide citizens with telephone numbers where they can obtain answers.

The answer to question 5 -- " Are there other facilities in the area that have not reported that are also emitting these substances?" -- is largely procedural, although it should have some substantive information if available:

> "Probably. The Local Emergency Planning Committee, interested citizens, and government agencies can use other information provided under Title Ill and other laws to try to identify facilities that may be emitting substances.
>
> Industry associations are also trying to get word out to their members about the obligation to report.
>
> Citizens who live near manufacturing facilities can certainly check with EPA or the [appropriate state agency that receives reports under section 313) to see whether neighboring facilities have reported.
>
> If not, they may talk to the facility manager to find out why. Remember, section 313 covers only some chemicals, so many facilities may have emissions they do not need to report.
>
> Also, facilities need not report if they use chemicals in amounts below specified quantities.
>
> Among the kinds of facilities that emit this chemical but are not included in the Title Ill requirement are __ . Because there are many such facilities in our community, there may be Borne cause for concern."

6) **What other sources might lead to my being exposed to these chemicals?**

The answer to this question is related to the answer to question 5, but can be based more closely on the data available under sections 312 and 313.

The chemical inventories submitted to the LEPC under section 312 tell what chemicals are stored in the community, thereby providing some indication of the range of possible exposures.

More important, the emissions data provided under section 313 provide some basic information about which chemicals are disposed to which medium.

If aggregated for the whole community, these data can suggest the routes by which people might be exposed to particular chemicals.

The newspaper article in which the emissions are reported for this scenario does not consider the medium to which the chemicals are emitted, but this information is readily available from the forms submitted to EPA and state agencies.

Because the answer to this question rests on considering data for all local facilities at the same time, officials may feel that they are unable to answer it -- they lack the time to do the necessary calculations.

In anticipation of such questions and needs, Congress required EPA to computerize the emissions data. The Toxic Release Inventory (TRI) database is available to the public at modest cost.

It contains all the emissions reports and allows users to examine the data in a variety of ways, including adding up all emissions of a particular chemical to a particular medium in a city or county.

Appendix 2 provides information on how to get access to the TRI database.

SERCs also have access to a similar database maintained at EPA, and may be able to provide some data to questioners.

Summary of Scenario 2: Routine Emissions

Citizen concerns about the routine emissions reported under Title Ill section 313 and described in the newspaper article cover a broad range of complex issues.

Officials without specific expertise in these areas should not attempt to explain the details, instead referring questioners to appropriate expert sources.

On the other hand, they should anticipate questions and prepare replies, since citizens may become angry if constantly told, "I cannot answer that. Please call so-and-so."

But don't make up an answer when you don't know.

Among the strategies for responding to questions about long-term health effects where there is uncertainty about whether the particular chemical causes a health effect and/or about whether the emissions in question are related to particular citizens' health problems are the following:

1. Risks or risk levels should be compared at two different times, compared against a government standard, or compared with different estimates of the same risk.

   Note that comparisons with government standards, which are set using a combination of political and scientific: criteria, may be misleading -- it is not true that everything less than the standard is "safe" while everything over it is "unsafe."

   Different risks, especially risks with different characteristics, should not be compared.
2. Questions of "safety'" are difficult to answer, especially on the basis of section 313 emissions data alone.

   Different people assess safety differently. However, statements describing how you would or are behaving in the same circumstances in combination with a description of the risk provide listeners with a basis for their own comparisons.

   People should have an opportunity to participate in determining whether existing levels of safety are sufficient.
3. Concern about risks may really reflect concerns about power or other political issues. Try to ascertain people's real concerns and answer those.

   Many concerns are really about whether procedures are fair and allow for adequate participation.

   Use the Local Emergency Planning Committee (LEPC) as a forum for all parties to work together.

4. Where possible, indicate ways people can control risks. They may be able to take some personal preventive action such as drinking bottled water and using pesticides more carefully around the home, or they may be able to join the LEPC or other community groups to act collectively against a risk.
5. Help people understand why the substance is present in the community in the first place.
   Familiar risks seem less worrisome than unfamiliar ones. Long chemical names are usually unfamiliar. Explaining what familiar items the chemical is used to manufacture may help people balance the risks and benefits.

Scenario 3: Storing Large Quantities

About six weeks after publication of the article on emissions data, the following article appears in the local newspaper.

Ourcity Daily News
100 of 366 Extremely Hazardous Substances Present in Ourcity

Possibility of Serious Accidents Great Emergency planning based on reports, but only 70 reports filed: How many are missing?

More than 100 of the 366 chemicals the federal government calls "extremely hazardous" are found in our community in amounts greater than 10,000 pounds.

Some of the chemicals are so hazardous that just a few pounds released into the air could kill hundreds of people under the worst conditions.

Seventy different facilities in New County have reported that they store these chemicals. Thirty of the chemicals are stored or used in quantities greater than 100,000 pounds.

Forty facilities reported using chlorine, the chemical that spilled three months ago in the North High basement causing the evacuation of 1100 stude111ts and teachers.

The New County Local Emergency Planning Committee, established under a new federal law designed to prevent chemical accidents, is developing a list of facilities that need to increase safety measures based on the list.

Extremely hazardous substances are chemicals determined by the federal Environmental Protection Agency to have the potential for causing serious human harm.

Facilities must report these and many other hazardous chemicals under the federal Emergency Planning and Community Right-to-Know Act.

The reports are available at the Ourcity Emergency Department, 110 Main Street.

Reporters from this newspaper examined the inventories submitted by local facilities as part of a continuing investigation into hazardous chemicals present in Ourcity.

We learned that:

- Seventy facilities have submitted inventories. The federal law covers all commercial facilities tha1t store hazardous chemicals in amounts greater than 10,000 pounds. There are 400 members of the Ourcity Chamber of Commerce. Charles Smith, president of Ourcity Citizens Against Toxics, stated that it seems likely that not all the facilities have reported that should have.
- Forty facilities store substances in quantities greater than 100 thousand pounds, and some as much as 1 million pounds. If storage containers leak, large quantities of chemicals could leach into the air or groundwater. Accidents involving many people are possible, mostly from fire or explosion.
- Among the substances stored in large quantities are chlorine, which produces a highly irritating toxic gas.
- There are at least 50 substances being stored in underground storage tanks. According to a recent survey conducted by the State Environment Department, more than half the underground storage tanks in the state are improperly built and in imminent danger of leaking.

Industry spokesmen emphasized the care they use in storing and working with the hazardous chemicals.

"We're closer to them than anyone else, so we have a strong incentive to be careful," said Tom Thomas of Generic Chemical. City and county emergency officials stated that the annual inspections of facilities storing hazardous chemicals convinced them that chemicals are properly stored.

They are working with facilities to reduce the possibility of accidents further.

They stated that the emergency response plan updated under the same federal law that requires submission of chemical inventories also ensures citizens' safety.

Neighbors of plants are not so sure.

"About once a month I hear the sirens over there," says Sharon Shivers, who lives in the North ridge neighborhood near the Generic plant. "I think their storage is faulty but they don't want us to know."

Citizens' Questions

After reading this article, citizens might ask the following questions:

1) Are the hazardous materials used by nearby facilities stored properly? What is the chance of leaks developing?
2) How likely are stored materials to be involved in an accident?
3) If they are released, what kinds of health or other hazards do they present?
4) Can we reduce the amounts of these materials that are stored in order to reduce risk?
5) What about the danger from chemicals stored by facilities that didn't have to report because they had less than 10,000 pounds?

Answers to these questions require some understanding of the process by which we plan for hazardous materials accidents and how we assess potential risks posed by facilities that store and use hazardous materials.

Some of the questions raise issues we have already considered-providing information about health effects and opportunities for citizens to participate in planning and risk reduction activities.

Planning for Hazardous Chemical Emergencies

Section 303 of Title Ill requires the Local Emergency Planning Committees (LEPCs) to formulate a plan for emergency response.

In order to make a realistic plan, LE PCs must first learn where and what chemicals are stored.

The chemical inventories submitted under sections 311 and 312 and the lists of extremely hazardous substances submitted under section 302 provide this information.

To plan for emergencies, LEPCs follow these steps:

1. Identify Hazards: using information provided by facilities, determine the ways in which they store and use hazardous chemicals.
2. Conduct a vulnerability analysis: using credible worst case assumptions, determine a vulnerability zone and identify special facilities within that zone such as nursing homes or schools or special problems such as a drinking water source.
3. Work with high-priority facilities to refine and re-evaluate the hazards identification and vulnerability analysis.
4. Complete a risk analysis: make a rough estimate of risks based on hazard identification and vulnerability analysis and likelihood of releases. Then, integrate this information into a community-wide emergency plan. (The components of a community-wide plan are described.)

Figure 2 shows a sample hazards analysis for an extremely hazardous chemical at one site.

If such an analysis is conducted for all hazardous chemicals found in the community, it will provide answers for many of the questions.

For example, the answer to the question "How likely are stored materials to be involved in an accident" may be found under Part 3 (Risk Analysis) of the Reevaluation section, which assesses risk after a change in the amount of the chemical stored.

There, the risk for accidents from chlorine is evaluated as being low because chlorine is stored in an area with leak detection equipment and alarms.

Information that the LEPC collects, even extra information such as a worst-case vulnerability analysis or transportation routes, is available to the public.

If the LEPC has completed a plan using the steps outlined above, it should be able to assist in answering the question about proper storage.

It is difficult to estimate the chance of leaks or accidents.

This question is answered by describing the planning process, which both encourages facilities to store their hazardous chemicals in the best way and sets up a plan for minimizing damage that might result if an accident does occur.

Again, in answering questions about accidents, it is important to remember the risk characteristics listed.

People feel more confident when it seems that all likely causes of accidents have been considered and planned for, because the risks seem more controllable, better understood, and less likely to be catastrophic.

Facility owners and managers have the final say over reducing the amounts of stored hazardous chemicals.

The LEPC can provide a forum in which citizens can voice concerns to industry representatives and work with them to get these amounts reduced.

Many facilities are willing to do this after they see the results of a vulnerability analysis.

They may find out that their inventory costs decrease as well by having less of each hazardous chemical on hand.

Information about the health effects of individual chemicals will also be available through the LEPC, health professionals in state and local health and environment departments, poison control centers, and academic institutions, or through the references listed in Appendices 2 and 4.

Figure 2: SAMPLE HAZARDS ANALYSIS FOR ONE EXTREMELY HAZARDOUS SUBSTANCE AT A HYPOTHETICAL SITE (REPEAT THIS ANALYSIS FOR EACH EHS AND SITE IN THE COMMUNITY)	
INITIAL SCREENING	
1. HAZARDS IDENTIFICATION (Major Hazards)	
a. Chemical	Chlorine
b. Location	Water treatment plant
c. Quantity	800 lbs.
d. Properties	Poisonous; may be fatal if inhaled. Respiratory conditions aggravated by exposure. Contact may cause burns to skin and eyes. Corrosive. Effects may be delayed.
2. VULNERABILITY ANALYSIS	
a. Vulnerable zone	A spill of 800 lbs. of chlorine from a storage tank could result in an area of radius-greater than 10 miles where chlorine gas may exceed the level of concern (LOC). This would be a credible worst case scenario.
b. Population within vulnerable zone	Approximately 600 residents of a nursing home; workers at a small factory; 29 workers at the water treatment plant; urban area-400 persons/sq. mile; total population in vulnerable zone is more than 125,000.
c. Essential services within zone	2 fire stations and 1 hospital
3. RISK ANALYSIS (Initial Evaluation of Reporting Facilities-Relative Hazards)	Relative to potential hazards of other reporting facilities -- high
RE-EVALUATION (PLANNING)	
1. HAZARDS IDENTIFICATION	
a. Chemical	Chlorine
b. Location	No change
c. Maximum quantity that could be released	500 lbs. (decrease)
d. Properties	No change
2. VULNERABILITY ANALYSIS	
a. Vulnerable Zone	Zone decreases (new radius - 1.0 miles) due to smaller quantity released and use of urban dispersion model.
b. Population within vulnerable zone	Decreases; total population in vulnerable zone is 1,250
c. Essential services	None
3. RISK ANALYSIS	
a. Likelihood of hazard occurrence	Low-because chlorine is stored in an area with leak detection equipment in 24 hour service with alarms. Protective equipment is kept outside storage room.
b. Consequences if people are exposed	High levels of chlorine gas in the nursing home and factory could cause death and respiratory distress. Bed-ridden nursing home patients are especially susceptible. High severity of consequences. However, gas is unlikely to reach a nursing home under reevaluated release conditions.
c. Consequences for property	Possible superficial damage to facility equipment and structures from corrosive fumes (repairable).
d. Consequences of environmental exposure	Possible destruction of surrounding fauna and flora.
e. Summary: likelihood/severity of on site	Low/High. (The community would assess this on a site- and incident-specific basis.)

Summary

The kinds of questions that storage raises are hard to answer. Because each facility and each community is different, the answers can only be obtained by working carefully through the specific data provided by local facilities. This is very time-consuming work. After the data are obtained, citizens will still have to work with experts to determine whether storage methods and quantities are appropriate and whether health effects are worrisome.

Rather than providing sample answers, as we did in the other scenarios, we can offer only general suggestions:

Officials can best answer most of these questions by

- referring to the plan and the procedures that went into creating it, and
- referring to the sources within government where citizens can work with government and industry.

Summary & Conclusion

The "Seven Cardinal Rules of Risk Communication, "written by Vincent Covello and Frederick Allen and available in an EPA pamphlet are reprinted here. They both summarize and add to the information presented in this manual.

1. Accept and Involve the Public as a Legitimate Partner
    - Involve the community early.
    - Involve all parties that have an interest or stake in the issue.
    - Remember, you work for the public.

The goal of risk communication should be to produce an informed public that is involved, interested, reasonable, thoughtful, solution-oriented, and collaborative.

2. Plan Carefully and Evaluate Your Efforts
    - Begin with clear, explicit objectives.
    - Evaluate the information you have about risks and know its strengths and weaknesses.
    - Identify and address the particular interests of different groups.
    - Train your staff -- including technical staff – in communication skills.
    - Practice and test your messages.
    - Evaluate your efforts and learn from your mistakes.
3. Listen to the Public's Specific Concerns
   If you do not listen to people, you cannot expect them to listen to you. Communication is a two-way activity.
    - Do not make assumptions about what people know, think, or want done. Take the time to find out what people are thinking.
    - Let all parties with an interest in the issue be heard.
    - Identify with your audience. Put yourself in their place and recognize their emotions.

People are often more concerned about trust, credibility, competence, control, voluntary fairness, caring and compassion than mortality statistics or quantitative risk assessment.

4. Be Honest, Frank and Open
    - State your credentials; but do not ask or expect to be trusted.
    - If you do not know the answer or are uncertain, say so. Get back to people with answers. Admit mistakes.
    - Disclose risk information as soon as possible.
    - Do not minimize or exaggerate the level of risk.
    - Lean toward sharing more information, not less – or people may think you are hiding something.

Trust and credibility are difficult to obtain. Once lost they are almost impossible to regain completely.

5. Coordinate and Collaborate with Other Credible Sources
    - Take time to coordinate with other organizations or groups.
    - Devote effort and resources to the slow, hard work of building bridges with other organizations.
    - Try to issue communications jointly with other credible sources.

Few things make risk communication more difficult than conflicts or public disagreements with other credible sources.

6. Meet the Needs of the Media
    - Be open with and accessible to reporters; respect their deadlines.
    - Provide risk information tailored to the needs of each type of media.
    - Prepare in advance and provide background material on complex issues.
    - Do not hesitate to follow up on stories with praise or criticism.
    - Try to establish long-term relationships of trust with specific editors and reporters.

The media are frequently more interested in politics than in risk; more interested in simplicity than in complexity; more interested in danger than in safety.

7. Speak Clearly and with Compassion

Technical information and jargon are barriers to successful communication with the public.

- Be sensitive to local norms, such as speech and dress.
- Use vivid, concrete images that communicate on a personal level. Use example and anecdotes that make technical risk data come alive.
- Use simple, non-technical language.
- Use risk comparisons to help put risks in perspective; but avoid comparisons that ignore distinctions that people consider important.
- Acknowledge and respond (both in words and with actions) to emotions that people express -- anxiety, fear, outrage, helplessness.
- Always try to include a discussion of actions that are under way or that can be taken. Tell people what you cannot do. Promise only what you can do, and be sure to do what you promise.
- If people are sufficiently motivated, they are quite capable of understanding complex risk information, even if they may not agree with you.
- Regardless of how well you communicate risk information, some people will not be satisfied.

These rules seem to be only common sense. Yet it is surprising how often they are violated when communicating about risk. Following them does not guarantee effective risk communication. On the other hand, it is unlikely that you will communicate effectively without them. There is also an informal eighth rule, which underlies all the others:

Know what you are talking about.

Since no one person can be expected to know everything, we have tried to provide sources for additional information as well as sample answers to questions in which you refer citizens to these sources.

Talking to people about risk is difficult. Certain buzzwords or ideas such as "cancer" often set off reactions that may be too strong. Many familiar chemicals that people use every day may have more serious effects than some of the unfamiliar chemicals they will hear about under Title Ill. Public officials must try to help citizens keep these risks in perspective.

Opportunity for Citizen Involvement

One of the most important factors that affects people's perceptions of risk is whether they feel in control. That is why several of our suggestions for response to citizen questions, especially when the questions cannot be answered with unequivocal scientific information, is to offer people a means for participating in decision-making about chemicals in their communities. Local Emergency Planning Committees (LEPCs) offer, or should offer, at logical place for such participation. Because LEPCs include representatives from government, industry, and citizen groups, they offer a good setting for encouraging the different interests to work together.

Risk communicators should take every opportunity to suggest direct ways in which individuals can take control to reduce their exposures to hazardous chemicals, such as standing upwind while filling the gas tank of an automobile.

Perhaps the single most important factor in communicating risks is that the source be perceived as trustworthy and willing to listen as well as talk. Other kinds of communication also benefit from these characteristics. Public officials can improve their effectiveness in many areas by learning the lessons of risk communication: develop a relationship of trust with people before some particular incident (such as a chemical spill) occurs, and talk with, not to, citizens. Although time-consuming, this strategy will more than repay the costs when what would otherwise be a divisive· community issue is settled through compromise and negotiation.

Plan of Action

We have covered the things you need to do to more effectively fulfill your role as a "risk communicator." How can you best use this information back on the job?

Unfortunately, there is no "formula" or "master plan" that will provide rote answers to every question you may ever face in risk communications. The following steps are suggested, however, as actions you can take starting today that will help prepare you for your responsibilities in this area:

1. Set a time by which you will have filled in all of the information on the "Risk Communication Resource Sheet" in the front of the manual. Some of the information you already have; other information might take some "digging." This resource sheet will provide a quick reference to many of the contact people who are knowledgeable about emissions, releases, stored substances, etc. Update this resource sheet annually.
2. Obtain copies of this manual for persons involved in your emergency plan.
3. Initiate contact, if you have not already done so, with members of your Local Emergency Planning Committee, and learn more about their activities.
4. Keep this manual in an accessible place for periodic review and/or in case of emergencies.

APPENDIX 1
Glossary of Commonly Used Terms

- Absorbed dose--The amount of a chemical that enters the body of an organism.
- Acute -- Sharp, severe; having a rapid onset, severe symptoms, and a relatively short duration.
- Acute exposure -- a single exposure of relatively short duration.
- Acute toxicity -- the development of adverse health effects soon after a single exposure to a substance.
- Additive effect -- Combined effect of two or more chemicals equal to the sum of their individual effects.
- Ambient -- Environmental or surrounding conditions.
- Animal studies (sometimes called "laboratory studies") lnvestigations using animals as surrogates for humans, on the expectation that results in animals are pertinent to humans.
- ATSDR -- Agency for Toxic Substances and Disease Registry, part of the U.S. Public Health Service, based in Atlanta, Georgia, 30333.
- Carcinogen -- A chemical that causes or induces cancer.
- CAS registration number -- A number assigned by the Che1mical Abstracts Service to identify a chemical.
- Chronic -- Occurring over a long period of time, either continuously or intermittently.
- Chronic effect -- effects that last a long time even if caused by a single acute exposure. (See also delayed effect.)
- Chronic exposure -- long-term, low-level exposure to a chemical.
- Concentration -- the amount of the substance in a representative unit of the medium.
- Delayed effect -- an effect of exposure that does not occur for some time. Sometimes called a "chronic" effect.
- Dose -- The amount of the substance that actually enters this body.
- Dose-response -- A quantitative relationship between the dose of a chemical and an effect caused by the chemical.
- Dose-response curve -- graphical presentation of the relationship between degree of exposure to a chemical (dose) and observed biological effect or response.
- Emission or release -- the amount of a substance released 1from a facility. Releases are usually classified as routine -- small regularly-released amounts that are

planned to be released as part of a manufacturing process -- and accidental.

- Endangerment assessment -- a site-specific risk assessment of the actual or potential danger to human health or welfare and the environment from the release of hazardous substances or waste. The endangerment assessment document is prepared in support of enforcement actions under CERCLA or RCRA.
- Environmental fate -- The destiny of a chemical after release to the environment; involves considerations such as transport through air, soil, and water; bioconcentration; degradation.
- EPCRA -- The Emergency Response and Community Right-to-Know Act of 1986; same as SARA Title Ill.
- Epidemiological studies -- lnvestigation of factors contributing to disease or adverse health effects in human populations.
- Exposure -- The contact with a chemical or physical agent. This contact can occur through breathing, drinking, eating, and by direct skin contact.
- Extrapolatlon -- Estimation of unknown values by extending or projecting from known values.
- Extremely hazardous substances -- Chemicals that have the potential for causing death or irreversible toxicity after relatively short exposure to small amounts. (They are acutely toxic.} On the basis of toxicity, generally in air, EPA has identified the list of the chemicals in Appendix 5.
- Latency -- Time from the first exposure to a chemical until the appearance of an adverse health effect.
- LC50 -- the concentration of a chemical in air or water that is expected to cause death in 50 percent of test animals living in that air or water.
- LD50-The dose of a chemical by a specific exposure pathway (eating, breathing, injection, or absorbed by the skin) that is expected to cause death in 50 percent of the test animals so treated.
- LEPC -- Local Emergency Planning Committee. Local body established under Title Ill.
- LOAEL -- Lowest-Observed-Adverse-Effect Level; the lowest dose in an experiment that produced an observable adverse effect.
- Laboratory studies – Studies of the effects of chemicals on animals or cells.
    - In vitro studies – Studies of chemical effects conducted in tissues, cells or subcellular extracts from an organism (i.e., not in the living organism}.
    - In vivo studies -- Studies of chemical effects conducted in intact living organisms.
- Long-term exposure -- This occurs when a substance is present in the environment around a person over a long period of time.
- MSDS -- Material Safety Data Sheet. A description of the chemical, physical, and health effects of a chemical along with methods for protection and emergency response written for workplace settings.
- Materials balance -- An accounting of the mass flow of a substance from sources of production, through distribution and use, to disposal or distribution, and including any releases to the environment.
- Mutagen -- An agent that causes a permanent genetic change in a cell other than that which occurs during normal genetic recombination.
- NOAEL -- No-Observed-Adverse-Effect Level; the highest dose in an experiment that did not produce an observable adverse effect.
- NRC -- National Response Center, 1-800-424-8802.
- Pathogen -- Any disease-causing agent, usually applied to living agents.
- Permissible dose -- The dose of a chemical that may be received by an individual without the expectation of a significantly harmful result.
- RCRA -- Resource Conservation and Recovery Act. Another federal statute concerning hazardous substances.
- Release -- see "Emission."
- Reversible effect -- An effect that is not permanent; an especially adverse effect that diminishes when exposure to a toxic chemical ceases.
- Risk -- The likelihood of injury, disease, or death.
- Risk assessment-A qualitative or quantitative evaluation of the environmental and/or health risk resulting from exposure to a chemical or physical agent (pollutant); combines exposure assessment results with toxicity assessment results to estimate risk.
- Risk estimate -- A description of the probability that organisms exposed to a specified dose of chemical will develop an adverse response (e.g., cancer).
- Risk factor -- Characteristic (e.g., race, sex, age, obesity) or variable (such as smoking, occupational exposure level) associated with increased probability of an adverse health effect.
- Route of exposure -- the avenue by which a chemical comes into contact with an organism (e.g., inhalation, ingestion, dermal contact, injection).
- SARA-Superfund Amendments and Reauthorization Act of 1986.
- SERC -- State Emergency Response Commission. Established under Title Ill.
- Teratogenicity -- The capacity of a physical or chemical agent to cause hereditary congenital malformations (birth defects) in offspring.
- Threshold -- The lowest dose of a chemical at which a specified measurable effect is observed and below which it is not observed.
- Title III -- the common name for the Emergency Planning and Community Right to Know Act of 1986, which is Title Ill of the Superfund Amendments and Reauthorization Act.
- Toxicity -- The quality or degree of being poisonous or harmful to plant, animal, or human life.

- TRl -- Toxics (or Toxic Chemical) Release Inventory. The database containing annual toxic chemical release reports submitted by certain manufacturing facilities, specified in Section 313 of EPCRA. The TRI is available to the public in county libraries, through a national computerized database maintained by the National Library of Medicine, and through regional EPA offices. See Appendix 2 for more information.

APPENDIX 3: Brief Description of Title Ill by Section

301 - establishes LEPCs and SERCs (State Emergency Response Commissions).
302 - requires facilities to notify the LEPC and SERC if they store more than the threshold planning quantity of any of the extremely hazardous substances.
303 - requires the LEPC to formulate an emergency plan.
304 - requires facilities that release more than a reportable quantity to notify the LEPC and the SERC (and NRC for CERCLA hazardous substances).
311 - requires all facilities that store any hazardous substance in amounts greater than 10,000 pounds (for hazardous chemicals) or 500 pounds or the threshold planning quantity, whichever is less (for extremely hazardous substances), to submit a chemical list or Material Safety Data Sheet (MSDS) to the local fire department, LEPC, and SERC.
312 - requires an annual report including quantities of chemicals characterized by hazard (Tier 1 report) or as individual chemicals (Tier II report) to be submitted to the local fire department, LEPC, and SERC.
313 - An annual report by manufacturing facilities only of emissions to air, water, or ground of chemicals on a list of about 300.
321 - in general, Title Ill does not preempt state laws; states and localities may require supplementary information.
322 - allows manufacturers to claim chemical identity as trade secret if they meet several conditions.
323 - allows some doctors, nurses, and public: health officials to obtain even information declared trade secret if they need it for treating patients and they promise not to disclose the information further.
326 - provides for lawsuits under certain circumstances by citizens against facilities that do not comply with the law and against agencies that do not fulfill their duties, and allows state and local governments to sue facilities.

EPA 550-F-98-003, March, 1998

CAMEO: COMPUTER-AIDED MANAGEMENT OF EMERGENCY OPERATIONS FACTSHEET

HOME

CAMEO® is a system of software applications used widely to plan for and respond to chemical emergencies. It is one of the tools developed by EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) and the National Oceanic and Atmospheric Administration (NOAA) to assist front-line chemical emergency planners and responders.

They can use CAMEO to access, store, and evaluate information critical for developing emergency plans.

In addition, CAMEO supports regulatory compliance by helping users meet the .chemical inventory reporting requirements of the Emergency Planning and Community Right-to-Know Act (EPCRA, also known as SARA Title III).

CAMEO also can be used with a separate software application called LandView™ III to display EPA environmental databases and demographic/ economic information to support analysis of environmental justice issues.

The CAMEO system integrates a chemical database and a method to manage the data, an air dispersion model, and a mapping capability.

All modules work interactively to share and display critical information in a timely fashion. The CAMEO system is available in Macintosh, Windows, and DOS formats.

Why Was CAMEO Created?

Rapid action by firefighter, police and other emergency response personnel often is severely hampered by lack of accurate information on the substance applied and safe response actions. Emergency planners lack a tool to store and easily use information that is essential for emergency planning.

Who Uses CAMEO?

- Firefighters
- State Emergency Response Commissions (SERCs) and Tribal Emergency Response Commissions (TERCs)
- Local Emergency Planning Committees (LEPCs)
- Industry
- Schools
- Environmental Organizations
- Police Departments

ORIGIN

CAMEO initially was developed because NOAA recognized the need to assist first responders with easily accessible and accurate response information. Since 1988, EPA and NOAA have collaborated to augment CAMEO to assist both emergency responders and planners.

CAMEO has been enhanced to provide emergency planners with a tool to enter local information and develop incident scenarios to better prepare for chemical emergencies. The Bureau of Census and the U.S. Coast Guard have worked with EPA and NOAA to continue to enhance the system.

What is in CAMEO®?

CAMEO is actually a suite of three separate, integrated software applications:

- CAMEO
- MARPLOT
- ALOHA

CAMEO® - The Database and Information Management

The original application called CAMEO, contains a chemical database of over 4,000 hazardous chemicals, 50,000 synonyms, and product trade names. CAMEO provides a powerful search engine that allows users to find chemicals instantly. Each one is linked to chemical-specific information on fire and explosive hazards, health hazards, firefighting techniques, cleanup procedures, and protective clothing.

CAMEO also contains basic information on facilities that store chemicals, on the inventory of chemicals at the facility (Tier II) and on emergency planning resources.

Additionally, there are templates where users can store EPCRA information. CAMEO connects the planner or emergency responder with critical information to identify unknown substances during an incident.

MARPLOT® - Mapping Applications for Response, Planning, and Local Operational Tasks

MARPLOT is the mapping application. It allows users to "see" their data (e.g., roads, facilities, schools, response assets), display this information on computer maps, and print the information on area maps.

The areas contaminated by potential or actual www.epa.gov/swercepp chemical release scenarios also can be overlaid on the maps to determine potential impacts.

The maps are created from the U.S. Bureau of Census TIGER/Line files and can be manipulated quickly to show possible hazard areas.

ALOHA® - Areal Locations of Hazardous Atmospheres

ALOHA is an atmospheric dispersion model used for evaluating releases of hazardous chemical vapors.

ALOHA allows the user to estimate the downwind dispersion of a chemical cloud based on the toxicological/physical characteristics of the released chemical, atmospheric conditions, and specific circumstances of the release.

Graphical outputs include a "cloud footprint" that can be plotted on maps with MARPLOT to display the location of other facilities storing hazardous materials and vulnerable locations such as hospitals and schools.

Specific information about these locations can be extracted from CAMEO information modules to help make decisions about the degree of hazard posed.

Other Planning/Response Tools

- LandView™ Ill - software that provides federal environmental and census data on maps
- Chemical Reactivity Worksheet. – provides information about the reactivity of 4,300 chemicals or mixtures of chemicals
- RMP Calculator- a software program that calculates vulnerable zone distances based on the Risk Management Program (RMP) Guidance for Offsite Consequence Analysis

CAMEO: COMPUTER-AIDED MANAGEMENT OF EMERGENCY OPERATIONS

HOME

NOAA's National Ocean Service • Office of Response and Restoration

Placing accurate, timely information in the hands of decision makers is vital to a safe, effective response to a chemical incident.

Designed to assist first responders and emergency planners get to key information quickly, the CAMEO (Computer-Aided Management of Emergency Operations) software suite has four core programs: CAMEOfm, CAMEO Chemicals, ALOHA®, and MARPLOT®.

How the CAMEO Software Suite Works

All programs work interactively to display critical information in an easy-to-understand manner. You can use the suite to:

- Manage data for emergency planning and response (including facilities, chemical inventories, contact information, and response resources).
- Access chemical property and response information.
- Find out how chemicals could react if they mixed.
- Estimate threat zones for hazardous chemical releases, including toxic gas clouds, fires, and explosions.
- Map threat zones and other locations of interest.

CAMEO is developed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA).

CAMEOfm Data Management Modules

Keep track of information related to emergency response and planning using CAMEOfm's eight data management modules.

For example, you can store information about the chemical facilities in your community, including contact information and chemical inventories. Once you've entered your data into CAMEOfm, you can use the other suite programs to:

- Link the records about facilities and other locations to symbols on a MARPLOT map. This will allow you to quickly get to your data from CAMEOfm or MARPLOT.
- Find out more about the chemicals in inventory by looking in CAMEO Chemicals to get response recommendations and physical properties, or use ALOHA to predict the threat zones (if the inventory chemicals were released).

The CAMEOfm modules are especially useful for data management tasks required under the Emergency Planning and Community Right-to-Know Act (EPCRA).

CAMEO Chemicals and Response Information

CAMEO Chemicals has an extensive chemical database with critical response information for thousands of chemicals.

- Chemical datasheets provide physical properties, health hazards, information about air and water hazards, and recommendations for firefighting, first aid, and spill response.
- UN/NA datasheets provide response information from the Emergency Response Guidebook and shipping information from the Hazmat Table (49 CFR 172.101).

You can also add chemicals to the MyChemicals collection to see what hazards might occur if the chemicals in the collection were mixed together.

Note: The CAMEO Chemicals website is available at http://cameochemicals.noaa.gov, and there is a mobile version of the site (http://m.cameochemicals.noaa.gov) that has been optimized for smaller screen sizes.

Additionally, there is also a desktop version of the program that has all of the same features as the online versions—but it can be run locally on your computer without an internet connection. Only the desktop version can share information with the other programs in the CAMEO software suite.

ALOHA and Threat Zone Plots

ALOHA can predict the area that could be affected by a toxic cloud, as well as potential threats from chemical fires or explosions.

Graphical outputs include threat zone plots, threats at specific locations, and source strength graphs.

A threat zone is an area where a hazard (such as toxicity, flammability, thermal radiation, or damaging overpressure) has exceeded a user-specified Level of Concern.

Threat zones can easily be displayed in ALOHA or on a MARPLOT map.

You can also import threat zones into ArcMap and ArcView using extensions that are available at http://response.restoration.noaa.gov/aloha_arctools.

MARPLOT and GIS-Compatible Output

With MARPLOT's easy-to-use GIS interface, you can add your own objects to maps, as well as view and edit data associated with those objects.

When you display ALOHA threat zones in MARPLOT, you can get population estimates for the potentially impacted area. You can also check within the threat zone for facilities storing hazardous materials and locations of special concern (such as hospitals and schools).

Important data about these locations (such as emergency contacts, hours of operation, and chemical inventories) can be displayed in the CAMEOfm data modules to help you make decisions about the degree of hazard posed by the incident.

Getting CAMEO

To download any program in the suite free of charge, go to http://www2.epa.gov/cameo.

CAMEO suite programs run on both Windows and Macintosh computers.

CAMEO Contact Information

For additional information: http://response.restoration.noaa.gov/cameosuite or cameo@noaa.gov

COMPUTER SYSTEMS FOR EMERGENCY PLANNING: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin # 5

HOME

ABOUT THIS BULLETIN

EPA is issuing this bulletin to assist local planners with identifying computer systems applicable to Title III of the Superfund Amendments and Reauthorization Act of 1986 (also referred to as the Emergency Planning and Community Right-to-Know Act).

The purpose of this bulletin is to provide Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other local planners with a checklist of computer system needs and information on available systems already identified as applicable to local planning.

The first section of this bulletin is an edited version of Appendix K of the Technical Guidance for Hazards Analysis.

This appendix is entitled "Evaluation Guide for Available Computer Applications Addressing Emergency Response Planning."

The second section of this bulletin is entitled "Preliminary List of Computer Applications and Systems of Potential Use under SARA Title III" and contains a list of computer systems applicable to local planning.

The list is not anticipated to be fully comprehensive of the environmental computer systems market nor is it intended to act as an endorsement for any of the listed systems.

The list is only intended to serve an initial reference source.

Vendor names, addresses, and phone numbers have been provided: it is essential that the vendor be contacted to obtain current cost, capability, availability, and limitation information for any system of interest.

Updates to the evaluation guide and list of computer applications will be made periodically.

APPENDIX K OF THE TECHNICAL GUIDANCE FOR HAZARDS ANALYSIS

EVALUATION GUIDE FOR AVAILABLE COMPUTER APPLICATIONS ADDRESSING EMERGENCY RESPONSE PLANNING

PURPOSE OF THIS CHECKLIST

This appendix contains a checklist of criteria developed to help local emergency planning committees (LEPCs), or other groups considering purchasing software, to identify computerized applications to assist in emergency response planning as outlined in the chapters of the Technical Guidance for Hazards Analysis.

The checklist identifies many of the ways that software applications can be of assistance.

The priorities and needs of the local planning district will dictate which criteria are to be considered and may require development of additional criteria.

SOURCES OF INFORMATION USED TO DEVELOP THE CHECKLIST

The checklist criteria were developed from information in the National Response Team's Hazardous Materials Emergency Planning Guide1 (NRT-1) and the Technical Guidance for Hazards Analysis.

NRT-1 was designed to help local communities respond to potential incidents involving hazardous materials.

The Technical Guidance for Hazards Analysis supplements NRT-1 by identifying the facility and transportation route information necessary for hazards analysis and emergency planning, providing guidelines for determining vulnerable zones, and outlining the process for analyzing risks.

Understanding the planning processes described in these documents and how the information being assembled will be used is a prerequisite for determining which computer application will best address the specific set of needs involved.

STRUCTURE OF THE CHECKLIST

- Section 1. Provides a checklist for evaluating the computer hardware (equipment) and additional software (programs) required to operate the system. The flexibility and ease of use of the system and the availability of training and other types of vendor support are also addressed.

The next sections of the checklist are based on the structure of the Technical Guidance for Hazards Analysis, and include:

- Section 2. Hazards Identification (assembling facility, transportation route, and chemical data);
- Section 3. Vulnerability Analysis (modeling of releases);
- Section 4. Risk Analysis (ranking of hazards); and
- Section 5. Emergency Response Planning (assembling hazards, vulnerability analysis, and risk analysis information).
- Section 6. Regulatory Requirements. This section describes a few of the ways that a software application can explain the requirements under Title III and assist in compliance with requirements, such as tracking deadlines and responding to requests for information.

NOTE: This checklist highlights some important user costs to be considered, however the total system cost is difficult to represent.

Some software applications may require the purchase of specialized hardware or additional software from other manufacturers.

Vendors may include fees for tailoring of the software application to meet a user's needs in the original price.

Training, manuals, technical support services, additional data entry, software updates, and additional copies of the software may be included or may need to be purchased separately.

In addition to the initial purchase costs of the application, the long-term investment required to install, maintain, and operate the full working system must be considered.

Such costs will include: assembling the required data; validating and entering the data; training new personnel; purchasing updated software; and correcting and amending the data as changes occur.

These costs will apply to some extent to any application purchased.

Assistance in estimating some of these costs may be available from data processing professionals within the State government or from computer-oriented firms located within the district.

SUGGESTED PROCEDURE FOR EVALUATING EMERGENCY RESPONSE PLANNING SOFTWARE APPLICATIONS

The suggested procedure for LEPCs to use the checklist is as follows:

1. Identify the local district's need to manage emergency response planning information under NRT-1 and the Technical Guidance for Hazards Analysis. Understanding how the information is to be used in the planning process is an essential first step to focusing the evaluation on the needs.
2. Select the criteria on the checklist that most closely represent the local district's needs and priorities for emergency response planning. It is not expected that all criteria listed will apply.
3. Develop any additional criteria required to address local needs and priorities (e.g., consistency with the type of computer equipment that is already available).
4. Rank the criteria according to levels of importance (e.g., must be met, would be valuable, can be delayed).
5. Identify vendors and their emergency response software from the available literature, advertising, and other sources. An initial list of commercial software applications is included in the second section of this technical assistance bulletin.
6. Request information from the vendors (e.g., sales literature, demonstration software, cost information, and current users of the application who can be contacted as references).
7. Review the information and complete a checklist for each software application.
8. Contact vendors to request any additional information and to clarify data on the applications that seem best suited to the need.

CAUTIONS: An evaluation must include the specific priorities and needs of the individual jurisdiction.

Any comparison of the cost of computer applications requires the assessment of many factors in addition to the purchase price identified by the vendor. (See note above for a detailed discussion of costs.)

Computer systems are continually being modified and refined.

The results of the evaluation will become out-of-date and should be repeated if the purchase of a system is delayed.

CRITERIA FOR THE REVIEW OF COMMERCIALLY AVAILABLE SOFTWARE APPLICATIONS FOR EMERGENCY RESPONSE PLANNING

COMPUTER SYSTEM REQUIREMENTS (Hardware, Software, Support, Etc.)	
Objective: Provide a basis to evaluate the functional capabilities, design limitations, and operational requirements of the system, and to evaluate the vendor's ability and willingness to support the system.	
Criteria	**Explanation/Examples**
1. Demonstrations of software application are available?	Either professional sales demo or current user demo may be available.
2. Documentation of software is available for review?	User's manuals and other explanatory material from vendor.
3. Software application is available for trial evaluation?	30-day free trial may be available from vendor.
4. Vendor is willing to modify application?	Application may require changes by vendor to allow specific community needs to be addressed.
5. Software is compatible with hardware already available or can be easily obtained?	Microcomputer; monitor; graphics board; modem; phone line; math co-processor; data storage space; digitizer; printer or plotter.
6. Computer system hardware memory can be expanded to meet anticipated needs?	Hardware can accept additional memory required to load software and modify the largest data file needed.
7. Requires additional software to be purchased from other companies to function?	Operating system; printer interface; graphics package.
8. Sold as modular components priced separately?	Modules may be selected and assembled to meet specific requirements (NOTE: software may require purchasing several modules to function properly.)
9. Total system cost is consistent with budget capabilities of user?	Costs of hardware, software, training, and data input may be hidden.
10. Limits hardware and data access by unauthorized users?	Access may be limited through passwords and/ or encryption of stored data.
11. User friendly and requires minimal amount of user training?	Menu driven; provides help screens; clearly presented instructions; uses a mouse or touch screen.
12. Vendor provides additional training that may be required?	Training classes and materials may be required when system is installed and as employees are· hired; cost of training should be considered.
13. Allows data entered by system vendor to be updated by user?	Allows modification of procedures for handling spill or release according to facility or community practices.
14. Allows new types of data not included in vendor's application to be entered by user?	New field of data can be added to database (e.g., new type of chemical information; facility response procedures).
15. Limits copying or distribution by copyright or copy protection?	Some vendors limit the ability to make copies of software and require copies to be purchased for each user.
16. Validates data as it is entered or stored in application?	Tests data against valid ranges (e.g., pH<14) or lists of acceptable data (e.g., chemical names).
17. In addition to using established keywords, allows searches to be performed with criteria chosen by user?	Data can be identified by other than preset criteria such as through menu (e.g., user defined searches).
18. Quality data sources were used and updates will be available as source information changes?	Chemical data content is current and generally accepted by science and health agencies such as EPA, OSHA, NIH, NOAA, U.S. Coast Guard, DOT, and others; cost and timeliness of updates should be considered.
19. Allows reports or graphs to be designed by user?	User can specify data to be included, physical layout, and headings for columns of data.
20. Allows data to be transferred (input and output) with other types of software packages and hardware systems?	System can communicate with other systems (e.g., Lotus, dBASE, ASCII, and DIF data formats; Macintosh and IBM equipment).
21. Is in use by others who are willing to provide information on their experience?	Vendors may provide names of current users of system who would be willing to discuss their experience.
22. Will system software and data be updated by vendor?	New capabilities compatible with current system may be added.
23. Vendor provides continued service and support if user experiences any type of difficulties in operating system?	If this type of service is available, maintenance and support fee will probably be charged.

HAZARDS IDENTIFICATION	
Objective: Provide information on the identity, quantity, location, physical properties, and toxicity of chemicals at sites within the planning district.	
Criteria	**Explanation/Examples**
Facilities	
1. Accepts data on one or more manufacturing and storage facilities?	Locations; activities; and inspection records.
2. Accepts chemical inventory and storage data?	Chemical names; quantities; site location(s); storage methods, temperature, and pressure.
3. Accepts information concerning facility accident potential or history?	Events that could result in damage; anticipated damage and consequences; and historical accident records.
4. Records or describes engineering controls and safeguards at specific facilities?	Detection, fire suppression, and security systems; containment and drainage systems; and utility shutoffs.
Transportation Routes	
1. Records shipping routes taken to deliver materials to facilities (e.g., highway, rail, and air)?	Identifies route taken and materials transported.
2. Accepts information on the major safety characteristics of routes?	Routes may create problems because of width; access; traffic patterns; and jurisdictions.
3. Logs transportation data, schedules, and exceptions?	Tracks planned cargo shipments for location and time expected.
Chemical Information	
1. Database contains information concerning the extremely hazardous substances?	As required by the Title III regulations (i.e., threshold planning quantities).
2. Contains information about the chemical and physical properties?	Flammability; reactivity; corrosivity; vapor pressures; physical states; boiling and melting points.
3. Contains the health hazards and risks, toxicological data, and first aid procedures?	Exposure routes and limits; signs and symptoms; target organs; and medical conditions aggravated by exposure.
4. Contains methods for the safe handling and use of the chemical and for emergency response?	Identifies the equipment, clothing and procedures required.
5. Indicates if notification requirements apply to the chemical released?	Identifies notification requirements for release of reportable quantities of chemicals (e.g., CERCLA, SARA).

VULNERABILITY ANALYSIS	
Objective: Identify geographic zone of community that may be affected by airborne release and populations subject to harm.	
Criteria	**Explanation/Examples**
1. Accepts information on areas around facilities and routes?	Drinking water supplies; cropland; sensitive natural areas.
2. Accepts information on characteristics of populations located in areas that could be in vulnerable zone?	Location of special populations (e.g., elderly; handicapped; prisons; and schools) and population density.
3. Calculates vulnerability zone based on the maximum quantity present for screening?	Calculations are based on credible worst case assumptions identified in the Technical Guidance for Hazards Analysis.
4. Allows site-specific inputs to calculation of vulnerability zones and provides release scenarios?	Calculations are based on site-specific planning factors such as wind speed, stability class, and chemical toxicity.
Modeling Release of Chemicals (predicting path, effect, and area of impact of chemical release using mathematical analysis)	
Inputs (information that drives the model)	
1. Accommodates physical characteristics of chemical?	Liquids at boiling point or ambient temperature; powdered solids; solids in solution; molten solids; gas density.
2. Addresses different types of releases?	Instantaneous and continuous releases including spills, leaks, fires, explosions, and BLEVEs.
3. Supports multiple point sources?	Modeling ability may be limited to specific set of pre-established sites or may be capable of representing releases from any possible location (e.g., transportation accident).
4. Addresses releases from any source or only pre-selected sources?	Several release sources operating concurrently.
5. Accepts data on meteorological conditions?	Wind velocity and direction; temperature; stability class; precipitation.
a) Allows observed data to be manually input?	Data are typed into system using the keyboard.
b) Allows modem link for direct data entry?	Accepts data directly from laboratories or weather stations.
c) Requires a meteorological tower for data input?	Facility or community meteorologic tower is required for data collection.
6. Accepts data input for level of concern?	Uses the data entered to calculate the vulnerable zones.
Algorithms (equation(s) and assumptions used to calculate results such as concentration of plume of released chemicals)	
1. Employs dispersion models consistent with chose used in Technical Guidance for Hazards Analysis?	Gaussian dispersion models based on Turner's Workbook of Atmospheric Dispersion Estimates, PHS Pub. No. 999-AP-26. Different air stabilities and wind speeds are used.
2. Identifies types of assumptions used?	Some models are not documented to provide information on assumptions used to perform calculations and their effect on model's results or do not identify the limits of the model's ability.
3. Calculates chemical dispersion rates and routes?	Provides information on plume size, motion, and concentration over time; and predicts toxic corridors.
4. Supports terrain modeling and considers complex terrain?	Ability to accommodate site-specific effects of terrain can be significant under some circumstances.
Outputs (the results of the calculations performed)	
1. Presents pictorial representation of dispersion plumes?	Presents model output as dispersion plume overlaid on map of area.
2. Produces line, bar, or pie graphs?	Presents model output in graphical format (e.g., concentrations experienced at a location over time).
3. Retains results of calculations in final form for future review or stores input parameters to allow results to be reproduced?	Systems differ in their ability to re-enact series of calculations or to reproduce specific output.

EMERGENCY RESPONSE PLANNING	
Objective: Assemble detailed information concerning hazards, vulnerability, and risk; provide action outlines for responders and criteria for plan review; present maps of the local area; and provide simulation capabilities for training.	
Criteria	**Explanation/Examples**
1. Provides detailed methods for promptly identifying affected area and population based on release information?	Mapping; modeling; demographical statistics worst case release.
a) Maps facility locations and transportation routes?	Provides details of relative locations of hazards and vulnerable zones.
b) Plans routes for hazardous chemical shipments?	Based on characteristics of routes available, selects least dangerous route.
2. Accepts emergency information and plans provided by chemical facilities?	Plans; procedures; site diagrams; emergency checklists.
a) Records facility emergency contacts?	Provides names, titles, and 24-hr. phone numbers for emergency purposes.
b) Generates floor plans of facility storage sites?	Shows building layout and chemical locations graphically.
c) Indicates location of engineering controls/safeguards?	Identifies safeguards such as emergency shut-offs graphically or by detailed description of the location.
3. Provides action outline for emergency responders?	Provides a chain of events or considerations that is based on the site-specific conditions involved.
4. Identifies needed emergency response equipment for various types of emergencies?	Provides a decision aid for choosing proper equipment and required medical supplies based on the chemicals involved.
5. Stores inventory of local response equipment and provides location and availability information?	Assists in the identification of equipment available from chemical facilities, local emergency responders, hospitals, other communities, and private contractors.
6. Stores information on community emergency procedures and plans?	Direction and control; communications; evacuation and sheltering; medical treatment facilities; resource management; cleanup and disposal; decontamination; and documentation.
7. Provides criteria for evaluating existing emergency response functions?	Identifies essential elements that should be present in plans based on regulatory requirements and local community priorities.
8. Prompts for information to update emergency response plans?	Flags information that changes frequently (e.g., emergency contacts, telephone numbers, and addresses).
9. Identifies hazardous material training program requirements and stores training information and schedules?	Provides criteria for evaluation of training programs and stores information on training completed per regulatory requirements.
10. Provides simulation capabilities for training?	Provides example test emergencies to exercise plan and train response personnel

RISK ANALYSIS	
Objective: Provide basis to judge relative likelihood (probability) and severity of various possible events. Risks can be expressed in qualitative terms (high, medium, low) based on subjective, commonsense evaluations, or in quantitative terms (numerical and statistical calculations).	
Criteria	**Explanation /Examples**
1. Allows judgment to be made concerning facilities and routes, for probable hazard and severity of consequences?	Judgment may be based on the accident history, type of facility, storage conditions, control technologies in place, and other factors.
2. Assembles quantitative facility information concerning possible release scenarios?	Recognized systematic approaches include: hazard operability study (HAZOP); event tree analysis; fault tree analysis.
3. Allows priorities to be recorded according to community concerns and opinions?	Judgment and concerns of the community can be entered into the ranking and prioritization for community hazards.

IDENTIFICATION OF REGULATORY REQUIREMENTS	
Objective: Track regulatory deadlines and assist in the assessment of compliance with reporting requirements, as well as record the status of required information and log requests for information.	
NOTE: These criteria concentrate on planning and response requirements of Title III of SARA. The following is only a partial list of the possible capabilities applications may possess with regard to the identification of regulatory requirements.	
Criteria	**Explanation/Examples**
1. Tracks deadlines for reporting requirements under Title III of SARA?	Deadlines for reporting as required under Title III Sections 302, 304, 311-312, and 313.
2. Provides means to respond to information reporting requirements of Title III of SARA?	Report capabilities may include production of submission forms or letters or partial assembly of needed information.
3. Has capacity to store and manage MSDS and chemical inventory form data?	Data manipulation including cross indexing lists to identify all facilities using particular chemical.
4. Addresses public requests for information under Title III of SARA?	Record type and number of requests and provide information to answer them.
5. Tracks status of planning in the local districts?	Identify when plan was developed and when it was last updated.

PRELIMINARY LIST OF COMPUTER APPLICATIONS AND SYSTEMS OF POTENTIAL USE UNDER SARA TITLE III

PURPOSE AND INTENDED USE OF THE LIST

This section contains a list of computer software applications and has been assembled as a reference source to assist local emergency planning committees (LEPCs) and others in locating potentially useful software applications. The list includes systems identified from readily available information sources. The principal intent is to identify software that is applicable to the information collection, data management, reporting, planning, or scheduling requirements of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The following list of categories was used in evaluating each of the systems:

- Emergency Response Planning Information (e.g., hazardous materials and facilities: locations, characteristics, training);
- Air Dispersion Modeling (e.g., releases; gas clouds);
- Other Environmental Modeling (e.g., water; groundwater; chemical properties);
- Facility Environmental Monitoring and Other Chemical and Waste Data (e.g., monitoring data; schedules);
- Facility Chemical or Waste Recordkeeping, Reporting, and Compliance Assistance (e.g., manifests, labels, report generation);
- Treatment/Pretreatment Assistance (e.g., recordkeeping);
- Facility or Treatment System Design Assistance;
- Cleanup Assistance;
- Facility Maintenance and Equipment Monitoring and Repair;
- Facility Permit Applications Assistance (e.g., NPDES, RCRA Part B);
- Facility Operations and Management Assistance (e.g., budget keeping, management records);
- Chemical and Properties Reference Source (e.g., MSDS information);
- Regulatory Reference Data Source;
- Federal/State Information Source (e.g., historical accident records).

The PURPOSE/DESCRIPTION/REQUIREMENTS column of Table I provides information about each system pertaining to these areas of apparent concentration. Within Table I, systems that are double asterisked (..) possess an apparent high degree of usefulness for SARA Title III planning, however this does not indicate any endorsement of the system's ability. The vendor should be contacted to determine the extent to which the system addresses specific .needs and to verify the system's capabilities.

The names or acronyms given to many applications are not easily recognized for the applications' ability to meet a particular need. The list therefore includes several types of systems that have no direct applicability to SARA requirements (e.g., wastewater treatment plant optimization; assistance with ordering chemicals). The creation of a comprehensive list of environmental applications provides a higher level of assurance that software that is relevant to Title III has not been overlooked. The list can also be used to eliminate systems from the review process and reduce the effort needed to identify a system that has the required capabilities.

SOURCES OF INFORMATION USED TO ASSEMBLE LIST

The list data were collected from a variety of sources, including:

- Published articles, as identified at the end of the list;
- Vendors sales literature, advertisements, and promotions; and
- Accumulated professional knowledge and expertise concerning the systems that have been developed.

Professional areas of expertise that were investigated included:

- Emergency response (including fire department) actions and planning;
- Occupational Safety and Health data management;
- Chemical information reference sources;
- Facility environmental data management and reporting; and
- Regulatory compliance reporting and data sources.

LIMITATIONS ON INFORMATION QUALITY AND CURRENTNESS

There are many limitations to assembling this type of list. Among the limitations that must be taken into consideration when the information in the list is used are the following:

1. The information provided to develop the list may be out-of-date.
   Changes to environmental computer applications occur rapidly, therefore, the list cannot remain current. New systems are being developed, vendors move or go out of business, and identified systems are being updated, sold to other vendors, tailored to new markets, or discontinued.
2. System descriptions are not intended to be comprehensive.
   The Purpose/Description/Requirements column of the table is provided only as a first indicator of some of the application's capabilities and to assist with modifying criteria that could eliminate the system from further review (e.g., hardware requirements).
3. Systems listed are not endorsed or approved by EPA.
   Much of the information regarding application capabilities has been taken directly from vendor sales literature or third party reviews. The information recounted has not been extensively verified or validated due to time constraints.

See the original file for the table of potential software packages listed in this Guidance.

MAKING IT WORK: HAZARDS ANALYSIS

HOME

What's Inside…

The Making It Work bulletins are intended to provide technical assistance to those responsible for implementing the Emergency Planning and Community Right-to-Know Act of 1986, commonly known as EPCRA or Title III.

Hazards Analysis, the second in the series, is intended for members of Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other agencies responsible for emergency planning and hazards analysis. The first bulletin addressed Title III compliance and future bulletins will cover such subjects as SERC operations and funding.

Inside you'll find practical information on hazards analysis, with examples drawn from successful or unique state and local programs.

You'll also find information on resources available to help you establish your own hazards analysis program. If you know of other innovative hazards analysis programs, we'd like to hear about them. Contact your EPA Regional Title III office or the Emergency Planning and Community Right-to-Know Information Hotline at 1-800-535-0202.

Why Conduct a Hazards Analysis?

Are your community planners trying to answer the following questions:

- What are the major chemical hazards in our community?
- How can we determine the area or population likely to be affected by a release?
- What emergency response resources (personnel and equipment) does our community need?
- What kind of training do local responders need?
- How can we help prevent chemical accidents?

The hazards analysis process described in this bulletin can assist local planners in answering these and other important planning questions.

Hazards analysis is a way of identifying the threats that hazardous substances such as ammonia, chlorine, and other chemicals pose in the community.

Under the Emergency Planning and Community Right-to-Know Act (commonly known as EPCRA or Title III), communities conduct hazards analyses to develop and revise emergency plans.

These plans are based on facilities where extremely hazardous substances (EHSs) are present in amounts exceeding the threshold planning quantity (TPQ), and for other facilities or transportation routes that the Local Emergency Planning Committee (LEPC) identifies as a focus of planning efforts.

The following three steps to a community-level hazards analysis are described in the Technical Guidance for Hazards Analysis, or "Green Book."

- **Hazards identification** identifies the location, quantity, storage conditions, and the specific hazards posed by the hazardous chemicals transported, manufactured, stored, processed, and used in the community.
- **Vulnerability analysis** locates geographical areas and the people, property, services, and natural areas that may be affected by a release.
- **Risk analysis** provides a ranking of specific release scenarios (e.g., X pounds of chemical Y released from facility Z under certain conditions) based on the likelihood and severity of the release.

The Handbook of Chemical Hazard Analysis Procedures, or "Brown Book," describes four steps within the hazards analysis process. The extra step, consequence analysis, is simply an elaboration of the risk analysis step discussed above.

To be successful, hazards analysis must be an ongoing process – the three steps should be repeated to address changes in the hazards and other circumstances in the community that affect emergency planning and response.

Coordination between facilities and local emergency planners and responders during the process will ensure a thorough evaluation of the community's hazards and allow planners to focus their efforts on the greatest Potential threats to the community.

Local emergency planners should consider conducting the hazards analysis process in phases.

This "phased" approach will allow planners to reduce the initial expenditure of valuable resources on analyzing less significant hazards and instead focus their efforts on the most important hazards in the community. There are three phases, as follows:

- Screening phase. Using readily available information and worst-case assumptions, determine which facilities and hazards in the community should be the subject of a more detailed analysis. LEPCs can use Technical Guidance for Hazards Analysis to complete this phase rather quickly.
- Planning phase. Refine the initial (worst-case) assumptions and get up-to-date information from the priority facilities identified in the screening phase and begin to develop the local emergency plan.
- Scenario phase. For priority facilities and transportation routes, develop a range of specific release scenarios that could pose the highest risk to the community. These

more detailed scenarios can be used to develop site-specific emergency response plans.

The Hazards Analysis Training Systems (HATS) is a computer program developed by EPA to introduce local planners to the hazards analysis process, the planning process, vulnerable zone calculations, and scenario development.

Various screens from the program appear throughout this document. Contact your Regional Title III office or the Title III Hotline for more information about obtaining HATS.

KNOW THE HAZARDS: HAZARDS IDENTIFICATION

As illustrated by HATS, identifying the hazardous chemicals that pose a serious threat to the community is the first stage of hazards analysis.

Communities of all sizes can develop simple programs, which meet their needs and match their resources, to locate these chemicals and to identify specific information on hazardous situations and the risks they pose.

Using information submitted to LEPCs, planners should first identify the facilities that use, produce, process, or store hazardous chemicals.

Under Title III, facilities that have EHSs in amounts exceeding a TPQ are required to notify the LEPC and designate a facility emergency coordinator to serve as the contact between the facility and the LEPC.

Planners may also consider identifying other hazardous chemicals that may pose significant hazards to the community.

These include flammable, reactive, and explosive substances; pesticides in rural areas; other chemicals present in substantial quantities; and even EHSs present in smaller quantities.

Contacting Facilities

The first step is to determine which facilities have hazardous chemicals. Conducting a survey of facilities in the community that handle hazardous chemicals can be a time-consuming process.

Developing a comprehensive list of facilities to contact can be difficult if there is no unified source of information about companies in the community. Local, state, and federal environmental records; Dun and Bradstreet and Chamber of Commerce listings; telephone directories; tax rolls; police and fire department records; and industry itself can be sources for compiling this list.

Once a list has been compiled, communities with a small number of facilities may find it more effective to take a more personal approach: contacting facilities by telephone, or visiting in person.

For most communities, success will depend upon the involvement of the fire service. Fire departments conduct fire prevention inspections, develop pre-incident plans, approve occupancy permits, serve on the LEPC, and are usually the first responders during an incident. As seen in the examples cited below, fire departments can play a critical role in gathering information for Title III plans.

If facility cooperation is a problem, fire departments have the authority under Title III section 312(t) to conduct on-site inspections and obtain specific location information on hazardous chemicals.

For instance, in Prince George's County, Maryland, fire stations conduct inspections and hazards analyses and prepare response plans at facilities covered under section 302.

An Alexandria, Virginia, ordinance requires businesses that store, use, or handle hazardous chemicals to obtain a hazardous substances use permit from the fire department.

As part of the review and approval process, the fire department conducts a facility inspection to verify the types and quantities of the hazardous chemicals present at the facility; this process provides an accurate record for hazards identification purposes.

Communities with a more extensive list of facilities could create outreach materials to maximize the response from industry and the usefulness of the information that is provided.

Mailing out a comprehensive survey may be necessary. For example, the Wyandotte County, Kansas, LEPC developed a chemical hazards survey to identify the facilities in the county that handled EHSs. Facilities were issued a questionnaire that addressed EHSs and 26 other potentially hazardous chemicals.

If any of these chemicals were present, the facility was asked to supply information on quantity; conditions of handling and use; special safety precautions and control devices; transportation; and facility preparedness, such as contingency planning, employee safety training, and response equipment.

The success of the Title III planning process depends upon the active involvement of both public and private individuals; local planners should support facility involvement in emergency planning, not simply as an attempt to force facilities to provide the required information -- although Title III section 303(d)(3) authority can be referenced if necessary -- but to tap into industry's resources in prevention and response efforts.

Local planners may want to designate a contact person for facilities that may be unfamiliar with the requirements of Title III.

Some facilities have developed community outreach programs as a part of the Chemical Manufacturers Association's Responsible Care program. Responsible Care facilities are committed to effective public dialogue and addressing public concerns by improving facility performance. Local planners should strive to coordinate efforts with these companies and encourage other facilities to become involved.

Right-to-Know

For each facility, planners should identify the quantity of each hazardous chemical present at any storage or processing location, the physical and chemical properties of each substance of interest, and the conditions of storage.

This information may be drawn from Title III reports under sections 311 or 312, as well as inspection and permitting records of state and local agencies; additional data may be requested from the facility itself.

As part of Title III's "Right-to-Know" concept, section 303(d)(3) requires facilities reporting under section 302 to provide the LEPC, upon request, with any information necessary for developing the local emergency plan, and can serve as compliance leverage for uncooperative facilities throughout the planning process.

Transportation

Emergency planners also need to identify the various routes through a community over which EHSs are transported. Identifying the dangers associated with the transportation of hazardous chemicals will be more difficult than for fixed facilities because transporters are not required to report under the planning provisions of Title III.

Nevertheless, transportation-related hazardous chemical incidents are a significant hazard, and such spills and releases pose an immediate threat to the public since they usually occur along normal traffic routes.

Representatives of trucking, railroad, air freight, and shipping industries, as well as representatives of the facilities that receive or produce transported products may be able to provide the following information:

- the hazardous chemical involved;
- the frequency of shipments (daily, weekly, or irregular schedule);
- the form of shipment (tank truck, tank car, drums, boxes, carboys in trucks or vans, pipelines, barges); and
- the quantity of each . shipment (tons or gallons), and/or the number of drums, tanks, vats, or carboys.

Planners in Butler County, Kansas, a relatively rural area, initially assumed that few hazardous chemicals where the hazardous were used or stored in chemicals are and which their community.

The county, however, has five major highways, two railroad lines, and 800 miles of pipelines, so the LEPC conducted a survey to identify the hazardous chemicals transported into, out of, or through the county. The LEPC developed a form for traffic watchers asking for the type of vehicle carrying a hazardous chemical and its placard number.

Eight major entrance points to the county, as well as seven points within the county, were surveyed over 12 hours to determine peak transportation times.

When the survey was completed, the information was plotted on a large map to give the LEPC a picture of where the hazardous chemicals are and which are the major routes of concern for planning purposes.

Planners may also want to coordinate with adjoining communities to share transportation information and reduce their collective workload.

For example, although Alexandria, Virginia, does not have any heavy industry, it is part of the major transportation corridor through and around Washington, D.C.

An Alexandria LEPC representative serves on a multi-jurisdictional task force on hazardous chemicals transportation which is exploring ways to reduce the likelihood of hazardous chemical accidents and developing incident response procedures for multijurisdictional events.

In addition, the Alexandria LEPC requests transportation route information from facilities as part of its hazards identification program under the authority of Title III section 303(d)(3).

The Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTUSA) provides funding for determining flow patterns of hazardous materials. Contact your SERC and/or the state HMTUSA contact for more information.

KNOW THE POTENTIAL EFFECTS: VULNERABILITY ANALYSIS

After identifying the chemical hazards in the community, but before making an assessment of the overall risk they pose, local planners should conduct a vulnerability analysis to estimate who is at risk from a potential hazardous chemical incident.

Using specific assumptions, vulnerability analysis estimates the geographical area that may be affected as a result of a spill or release.

Specifically, the vulnerability analysis identifies people (numbers, density, and types – facility employees, local residents, and special populations) within the vulnerable zone; private and public property and essential support systems (water, food, power, and communications sources, as well as facilities such as hospitals, police, and fire stations) that could be damaged; and sensitive natural areas and endangered species that could be affected.

In Pierce County, Washington, the LEPC also incorporates natural hazards, such as fault lines and floodplains, into the mapping system that identifies vulnerable zones.

During an actual incident, the area potentially affected by a release is simply the area downwind. But because the wind direction at the time of the release cannot be predicted, planners must consider all possible wind directions and subsequent toxic plume paths.

Consequently, vulnerable zones are circles with the release site located at the center.

Estimating vulnerable zones for toxic hazards may be done by hand or with the assistance of a computer modeling program.

If the task is to be completed by hand, the Technical Guidance for Hazards Analysis provides complete step-by-step instructions, including the mathematical formulas and tables for calculating the radius of the zone.

Planners will also need to gather maps of the planning district and surroundings, and information sources (e.g., Material Safety Data Sheets and section 312 Tier II reports) on the hazardous chemicals involved.

Always keep in mind that the vulnerability analysis results are only as good as the assumptions that were made throughout the process. The results are estimates, best used for planning and training, and not to be relied on during an actual response.

If sufficient resources are available, a computer modeling system will reduce the time spent calculating vulnerability zones.

Plume modeling software packages are often included as part of a more complete emergency planning system designed to address many elements of the emergency planning process. ARCHIE and CAMEO are two computer systems that the federal government has designed and made available to and assist local emergency planners in preparing for and responding to an airborne release of a hazardous chemical.

CAMEO also provides the tools necessary to manage and use information collected under Title III.

The system was developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA to assist LEPCs, emergency responders, emergency planners, and others involved in activities concerned with the safe handling of chemicals.

CAMEO is being used by local governments, fire departments, and industry throughout the United States, including the cities of Miami (Florida) and Portland (Oregon).

Several other systems are also available and have been documented in EPA's CEPP Technical Assistance Bulletin: Identifying
Environmental Computer Systems for Planning Purposes (OSWER-89-005). Contact your Regional Title III office for a copy.

Protective Actions: Evacuation and In-Place Protection

Although decisions on personal protection must be made at the time of an actual event, effective hazards analysis will assist in training and planning for protective actions. Short-term releases, fast-moving plumes, or unstable weather conditions can make evacuation difficult; often the danger is over before an evacuation can be completed. In these cases, in-place protection may be the most appropriate action during the release of a chemical. On the other hand, if the release occurs over an extended period of time, or if a fire cannot be quickly controlled, an evacuation may be the appropriate option. Decisions should be based on several important factors:

- Physical and chemical properties of the hazardous substance;
- Short-term exposure effects;
- Dispersion patterns;
- Weather conditions;
- Anticipated size, duration, and rate of the release; and
- Concentration of the release in the surrounding air, water, or land.

The emergency planning process can help build a sense of trust between citizens and emergency responders to improve public understanding of the need and methods for conducting effective protective actions. For example, parents must be confident that local school officials will take appropriate protective measures during an incident, so that their first action is not to rush outside to pick up the children at school, but to protect themselves. In St. Charles Parish, Louisiana, the LEPC annually issues a brochure to all citizens on protective action procedures, and takes a pro-active approach to communicating this message to the public. Full community emergency siren drills are held annually, and three full-scale chemical release exercises are held at local facilities during the course of the year. The Harford County, Maryland, LEPC, in conjunction with a local cable television company, produced a video to identify the proper steps to take in response to a potential hazardous materials incident The video also suggests that families should conduct hazardous material release drills just like a family fire drill.

KNOW THE ODDS: RISK ANALYSIS

Once the chemical hazards in the community and the potential areas of impact for their release have been identified, the third stage in a hazards analysis, risk analysis, can be conducted. Risk analysis is a judgment made by the LEPC based on an estimate of:

1) Likelihood of an accidental release, based on various factors such as the history of releases at fixed facilities and in transport, current conditions and controls at facilities, unusual environmental conditions, and the possibility of simultaneous emergency incidents (such as flooding or fire) resulting in the release of hazardous chemicals; and
2) Severity of consequences – the people, places, and things located within the vulnerable zone. Risk analysis does not require extensive mathematical analysis (although probabilistic risk analysis can provide valuable information to community planners), but instead relies on the knowledge, experience, and common sense of local emergency planners and responders using

information gained from hazards identification and vulnerability analyses.

In Wyandotte County, Kansas, for example, the LEPC ranked facilities based on the ratio between the total amount of the hazardous chemical on site and the quantity of concern (a measure of a substance's acute toxicity).

The ranking was thus a measure of the relative health threat that a release might pose to the surrounding community.

Facilities that had at least 1,000 times the quantity of concern for a chemical were given first priority in the planning process; a second tier of facilities with a smaller multiple of the quantity of concern were addressed in a second phase of the process.

TIPS FOR SUCCESS

Across the country, there are several thousand LEPCs and tens of thousands of facilities that have made the required notification under section 302 of Title III.

Inevitably, there will be differences between the hazards analysis process in one community and that of another, but any successful program will be driven by three features:

- Focus on the most severe threats to the community;
- Responsiveness to the community's chemical emergency preparedness and prevention concerns and interests and the community's right-to-know; and
- Effective coordination and involvement among planners, responders (e.g., the fire service), and industry.

Address Priority Hazards

Because planners are usually not able to evaluate and address the risks posed by every facility at the same time or to the same extent, priorities must be set among the potential hazards in the community.

The Technical Guidance for Hazards Analysis suggests that planners perform an initial screening of hazards using readily available information (e.g., Tier II reports) and certain credible worst-case assumptions.

Once this initial three-step hazards analysis (i.e., hazard identification, vulnerability analysis, and risk analysis) has been completed, planning officials should consider redoing the analysis based on the priority ranking obtained from the initial round of risk analysis.

These revised analyses will be based on more realistic assumptions about site-specific conditions derived from consulting with facility representatives and other local officials.

To perform such analysis, local planners may want to request additional information to evaluate specific release scenarios for each priority facility, including the adverse health effects of each substance; successful required by OSHA's approach to hazards mitigation approaches used in the past; lessons learned from past events; and facility process hazard analyses.

In addition, existing emergency response plans may also be a valuable information source. Planners may want to review:

- Their community's FEMA local multi-hazard emergency operations plans (required and funded by FEMA);
- Facilities’ transportation-related hazard plans;
- Facilities' emergency response planning required by OSHA’s HAZWOPER (SARA section 126) and process safety management standards;
- Facilities' emergency response program required as part of the risk management plan under section 112(r) of the Clean Air Act;
- The Spill Prevention, Control, and Countermeasures plans (required under the Clean Water Act), if they are available; and
- State and local planning requirements.

HATS also provides additional guidance on the phased approach to hazards analysis.

The Hamilton County, Ohio, LEPC identified ten priority facilities and requested that they conduct the hazards analysis themselves, using the Technical Guidance for Hazards Analysis and an LEPC worksheet for vulnerability and risk analyses.

After LEPC review, the initial facility risk analyses appeared to underestimate both the likelihood and the severity of consequences of an accidental release, so the LEPC developed a second, more quantitative risk evaluation form.

Probability is estimated based on contingency planning, storage conditions, monitoring and inspection procedures, history of leaks and spills, and employee hazardous chemical awareness.

Severity of potential consequences is rated based on the capacity of on- and off-site response personnel and the anticipated property damage and environmental effects.

Points are assigned for factors that reduce the probability and severity of a release -- the lower the score, the higher the probability or severity of a release.

Maximizing Your Hazards Analysis Resources

Coordinate to Avoid Duplicative Efforts

- Use existing Title III, inspection, and permitting records to avoid time-consuming data collection efforts.
- Share computer resources to avoid expensive purchases.
- Coordinate with adjacent localities to share the burden of evaluating hazards.
- Identify and use chemical-specific and hazards analysis expertise of local industry.
- Review existing emergency operations plans to identify hazards.
- Support chemical emergency prevention and other emergency preparedness efforts to maximize value of hazards analysis task.

Take Advantage of Free or Inexpensive Federal Resources

- Technical Guidance for Hazards Analysis ("Green Book")
- Computer-Aided Management of Emergency Operations (CAMEO)
- Handbook of Chemical Hazards Analysis Procedures
- Automated Resource for Chemical Hazard Incident Evaluation (ARCHIE)
- Training and workshops on hazard analysis (e.g., HATS program).
- Emergency Planning and Community Right-to-Know Information Hotline: l-800-53S-0202.

Apply for Grants under HMTUSA

The Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTUSA) provides for grants to support LEPCs in conducting hazards analyses. Hazards analysis is identified as one of the activities eligible for funding under the planning grant program. These grants, and grants for training efforts, will be available through 1996. LEPCs should contact the state agency designated by the Governor as the primary lead for the HMTUSA program to learn more about the state's planning grant application.

Adapt Analysis to Local Circumstances

Even though the federal government has provided guidance and software to assist SERCs and LEPCs, Title III is a local program and decisions about relative risk and planning priorities are local decisions that will differ from place to place, depending upon circumstances.

For example, the availability of resources (i.e., equipment, expertise, volunteer time, and dollars, as well as the creativity and resourcefulness of LEPC members and the willingness of facilities to cooperate with LEPCs) will play a major role in shaping the scope of local planning activities. A number of ways to stretch local resources are highlighted in the box. Rather than ranking facilities or release locations, the Pasadena, Texas, LEPC focused its hazards analysis on fifteen priority chemicals manufactured or stored in the community that facilities judged to be of major concern in the event of a release. For each chemical, the LEPC identified locations and quantities, modes of transportation, and the substance's hazardous properties. The LEPC then conducted a vulnerability analysis for each chemical location using typical weather conditions. Next, the LEPC determined which people and services a release could affect and the specific hazards they might face. In addition to the chemicals classified as airborne toxics, Pasadena examined chemicals that present flammability or explosivity hazards. The LEPC then ranked the fifteen chemicals so that planners could identify the community's chemical-specific response needs.

The State of Idaho used Technical Guidance for Hazard Analysis as a starting point and developed a "blueprint" for LEPC hazards analysis efforts. The step-by-step guidance to hazards analysis explains how to incorporate the use of such programs as CAMEO and ALOHA, but focuses on planning and information management methods that do not require a computer.

USING THE RESULTS OF HAZARDS ANALYSIS

Once the LEPC has finished evaluating the hazards in the community, the hazards analysis information can be used to support other local chemical emergency preparedness and chemical accident prevention efforts. The realistic release scenarios for the priority hazards in the community, refined from initial worst-case assumptions, can be communicated to the community to help improve awareness of chemical hazards. The local emergency response plan can then be designed to address specific incidents described in these scenarios. In the event of an actual incident, current weather conditions (e.g., wind direction and speed, atmospheric stability) and accurate release data (e.g., quantity and rate of release) can be entered in the appropriate preexisting scenario to derive realistic estimates of possible off-site impacts of the release. In addition to planning and real-time response applications, scenarios can be used to develop realistic exercises to test local emergency response capabilities. LEPCs, SERCs, and facilities are also applying hazards analysis to help facilities prevent of chemical accidents.

Flammables and Explosives

Although none of the current EHSs was designated based upon its flammable and explosive properties, EPA recently published an Advanced Notice of Proposed Rulemaking to add commercial explosives and blasting agents, and is evaluating options for flammable substances. This addition, if enacted, would provide fire departments and LEPCs with information on explosive hazards that is not currently being provided under sections 311 and 312 because these substances are dangerous in quantities below the 10,000 pound reporting threshold. Local contingency planners could then formally address substances beyond those currently listed under section 302. For the present, however, communities that wish to evaluate flammable and explosive hazards should use existing permitting or licensing information or the authority of section 303(d)(3) of Title III.

Because the Technical Guidance for Hazards Analysis does not address flammable and explosive hazards, the evaluation of additional hazards that these substances pose can be formally conducted using the Handbook of Chemical Hazards Analysis Procedures and ARCHIE.

Reviewing these hazards can direct planning efforts to additional sites, or indicate that a specific site deserves priority because it poses multiple hazards to the community. ARCHIE has modelling programs for fires and explosions of flammable liquids and gases and detonations of solid and liquid explosives. In order to model these release scenarios, planners must identify certain physical and chemical properties of the substance, the quantity involved, the type of release, the existing temperature and pressure conditions prior to the release, and weather conditions. Some of these data may be available from sections 311-312 reports, fire department records, or from the facility, if reporting is not required.

Getting the Word Out

The LEPC has a responsibility under section 324 of Title III to inform the public about its right to know. Many LEPCs have gone beyond the modest mandate to publish the fact that the various facility reporting forms and LEPC plans are available for public inspection.

During EPCRA Awareness Week (January 1992), the District XI LEPC in Florida, serving Broward, Dade, and Monroe, counties, held public outreach workshops focusing on citizen information. The workshops included presentations explaining the hazards identification, vulnerability and risk analysis process, and graphically showed citizens sample facilities and their respective vulnerability zones. In addition, the Sun Sentinel published a feature story and a two-page article that named and located on a county map the over 80 facilities reporting under section 302 and listed the extremely hazardous substances at those facilities in Broward County (Ft. Lauderdale metro area). All of the LEPCs in Florida reported a measurable increase of public requests for EPCRA information as a result of the Awareness Week activities.

Planning Applications

Knowledge of the hazards present in the community will enable planners to identify what response personnel and equipment are needed for the community, as well as what training will be necessary. The identification of the health threats in the community will support the development of necessary emergency medical care procedures.

Public notification and alarm systems in the community should reflect the results of vulnerability analyses. Public education efforts may be needed to describe evacuation and in-place protection procedures. The Alaska SERC is providing technical and financial assistance to its LEPCs as part of a statewide hazards analysis project. The project generally will follow the airborne toxics approach outlined in the Technical Guidance for Hazards Analysis, but the analysis has been expanded to include facilities with flammables and explosives, as well as the potential for chemical and petroleum spills to impact the drinking water supply or sensitive ecosystems. Once the information has been compiled at the local level, it will be transferred into a statewide CAMEO system, and eventually incorporated into a Geographical Information Systems format, along with data from other state environmental programs.

"The hazards analysis data will also be used as the basis for evaluating emergency response capabilities as part of an effort to establish volunteer response teams and equipment depots across Alaska.

As part of the hazards analysis process, local fire departments and other planning officials may want to inspect facilities to collect specific information and develop a working knowledge of the facility in order to pre-plan for an emergency response situation. The emergency dispatcher can be made aware of locations with extra hazard potential in the event of an emergency (e.g., incompatible materials stored in close proximity or extremely flammable or explosive substances.) A special notation can be included to indicate that the local hazardous materials team should be dispatched immediately or placed on alert.

Under the Clean Air Act Amendments of 1990, many facilities in your community may be required to provide information on the ways they manage risks posed by certain substances listed by EPA and indicate, by submitting a risk management plan (RMP), what they are doing to minimize risk to the community. These provisions are likely to generate more detailed facility-specific information useful for LEPC planning purposes.

One component of the RMP will require facilities to prepare detailed off-site consequence analyses. The RMPs, with their analysis of off-site impacts, will help LEPCs update their community plans. LEPCs will also be better able to coordinate community plans with facility plans.

The Chandler Fire Department in Arizona requires facilities with certain categories of hazardous chemicals to file a hazardous materials management plan (HMMP) when applying for a hazardous materials permit. The HMMP includes a section requiring completion of a vulnerability analysis. Their guidance for preparation of a vulnerability analysis suggests using the Technical Guidance For Hazards Analysis for information regarding vulnerable areas. This HMMP is similar to the RMP that is required by the Clean Air Act Amendments.

Prevention Implications

Hazards analysis allows local emergency planners and industry to work together to reduce hazards in the community and prevent future accidents. As with the implications for planning efforts, the LEPC, or specific members such as the fire departments, can identify prevention strategies while gathering the information to conduct the hazards analysis. Some important questions to keep in mind when looking at a specific facility are:

- What possibilities exist for substituting less dangerous chemicals for any hazardous chemicals at the facility?
- What possibilities exist for reducing the quantity of the hazardous substances in use or stored at the facility? Can this be done without increasing transportation-related dangers?
- Have operation or storage procedures been modified to reduce the probability of a release and minimize potential effects?
- What is the overall layout and spacing of the storage area, process areas, and other positions with respect to the plant property line? What is the spacing between the individual equipment both in storage and process areas? Are incompatible chemicals separated sufficiently? What areas and pathways will be available for the movement of personnel and vehicles in the event of an emergency? Are placards describing the hazard of the chemical displayed prominently?
- How are the hazardous substances received/shipped? How often and in what quantities? Are there dedicated personnel trained in the handling of these materials?

The role of hazards analysis in a chemical accident prevention program can vary from influencing a single facility's inventory decisions to serving as the basis for a state-wide initiative. The Washington, D.C. LEPC and the State of California are examples at each end of the spectrum. After receiving a section 302 notification from a local water treatment plant, the Washington, D.C. LEPC encouraged the facility to reduce its storage of large quantities of chlorine. The company did not realize the potential hazards such storage posed to the surrounding community, and volunteered to reduce its on-site inventory.

On the other hand, the State of California has developed, as part of its implementation of state legislation, the Risk Management and Prevention Program (RMPP). The program is designed to reduce the number of releases and the potential for casualties and evacuations; to reduce facility expenses for equipment breakdown, materials loss, clean-up costs, and claims litigation; and to improve environmental protection. Facilities with the potential for a significant off-site impact from an EHS release are required to develop an RMPP. A comprehensive facility RMPP report includes a record of EHS accidents; a description of the equipment used in conjunction with EHSs; facility controls to minimize the risks of a release; monitoring, backup, mitigation, and transportation and storage procedures and systems; and the facility safety audit, inspection, and recordkeeping policy. The final step in the facility RMPP is performing a hazards assessment, which serves as the basis for developing a facility prevention program consisting of release reduction techniques, systems, and procedures, and a schedule for their implementation.

WHERE DO YOU GO FROM HERE?

Hazards analysis is an on-going process. Unfamiliar hazards and inaccurate records can seriously undercut the effectiveness of contingency planning and emergency response procedures. Records must be regularly updated to account for new chemicals and facilities in the community, changes in the quantity of chemicals at facilities, or even the movement of chemical storage and process locations within facilities. As a result of these changes in the hazards environment, local planners may need to revise individual scenarios for vulnerability and risk.

Thus, the additional information required for these stages in a hazards analysis (e.g., the identification of schools, hospitals, and other special populations; community emergency response capability; and facility release prevention and mitigation procedures) should also be updated regularly. Although hazards analysis can seem at first a highly resource intensive and complex task, it is the responsibility of the LEPC to put the process of hazards identification, vulnerability analysis, and risk analysis into practice in the community so that vulnerable populations can be protected. As described in this bulletin, each of these steps can be, and have been, conducted in a fashion that matches LEPC resources and concerns, and the process itself can be used to support a variety of other chemical emergency preparedness and prevention activities.

HAZARDS ANALYSIS ON THE MOVE

SARA Title III (EPCRA) and Conducting a Commodity Flow Study

Mode of Transportation	Number of Incidents	Associated Deaths	Associated Injuries
Highway	48,907	113	1,762
Rail	8,620	0	611
Air	1,177	0	127
Other (includes freight forwarders and water transportation)	1,108	1	91
TOTAL	59,812	114	2,611

Between 1987 and 1989, U.S. Department of Transportation (DOT) officials reported almost 60,000 transportation incidents that resulted in an unintentional release of hazardous materials. How can you assess the transportation risks facing your community? Is your community prepared to face these risks?

The purpose of this document is to help you as local planners (e.g., tribal and state LEPCs, and other planners) and responders, develop a method to determine what hazardous materials are being transported through your community and the priority areas of risk that warrant further analysis and study. By doing so, you can assess and improve existing strategies to minimize risk (both public and private) and the response capabilities within your jurisdiction.

In the Emergency Planning and Community Right-to-Know Act (EPCRA), Congress recognized the risk to communities posed by the transportation of hazardous materials and required that emergency response plans developed by LEPCs identify the “routes likely to be used for the transportation of substances on the list of extremely hazardous substances....” One way to approach this requirement and to address all of the hazardous materials being transported through your community, is to conduct a hazardous materials commodity flow study (CFS). A CFS is an assessment of the types and volumes of materials moving through your community. For some communities, especially those in rural areas, transportation may pose the only hazardous materials risk. In light of the number of accidents that occur (see chart at left), identifying and understanding transportation-related risks are critical components of emergency preparedness and prevention. The goal of the CFS is to use the information collected to increase your preparedness, prevention, and response capabilities.

What are the objectives.

A CFS is the hazards identification step of transportation hazards analysis, described in Technical Guidance for Hazards Analysis, an EPA, DOT, FEMA publication. A CFS is the collection of existing and new data on transportation patterns in your jurisdiction. Combined with accident histories, geography, and other local conditions, a CFS will help you characterize hazardous materials transport, identify locations of risk and other vulnerable areas, and formulate emergency planning, prevention, and response measures. Some specific objectives of performing the CFS are:

- Identify major hazardous materials traffic corridors;
- Characterize types of substances, shipment frequencies, container types, and container capacities;
- Specify the location, length, and nature of priority highways, rail tracks, and other routes (paying special attention to those that pass through or along densely populated or sensitive environmental areas);
- Characterize any local terminals or other gathering areas for hazardous materials transport vehicles such as truck stops and weigh stations; and
- Compile data on any travel and route restrictions in effect for the region.

Many communities have conducted CFSs that identify the types, amounts, and routes of hazardous materials being transported in and through their region. You can learn from their experiences, several of which are discussed throughout this document. You will see that conducting a CFS involves some methods different from those used for hazards identification at your fixed facilities. Instead of referring to information on conventional facility reports such as Material Safety Data Sheets or Tier II Reports, you will need to collect data that may or may not be readily available from public or private sources. You must account for different modes of transportation (e.g., railways, highways, pipelines, waterways), and develop an estimate of the types and amounts of hazardous materials being transported in and through your region. Our discussion begins by presenting tips for getting organized, looks at methods for gathering the necessary data, and then examines the ways in which you can apply the results of a CFS. Finally, we consider some technological and legislative changes that may be of help to your transportation planning efforts.

Getting Organized

Who needs to be involved?

As an LEPC, you may wish to form a separate transportation hazards advisory committee to lead the effort, or the LEPC as a whole may take the lead role. Whether or not you are able to form a committee that meets regularly, the LEPC should identify state and local professionals to assist in identifying sources of information and to review drafts.

To cultivate broad-based support, an advisory committee should reflect local conditions and include representatives from the LEPC, local planning councils, the public works department the State Department of Transportation, the U.S. Coast Guard, airport and port authorities, industry, police and fire departments, and the SERC. Once the advisory committee has been formed, it must formulate a workplan for the study itself. In developing this workplan, the advisory committee should take the time to determine specific objectives, what data are available, and what data are needed in order to accomplish the goals of the CFS quickly and efficiently. This will give the CFS a clear focus and give the committee a better idea of what resources will be necessary to complete the study. Throughout this document different methods are suggested. You should evaluate your needs against available resources, and modify your approach accordingly.

LESSONS LEARNED

The National Institute for Chemical Studies (NICS) is in the process of conducting a CFS as part of a comprehensive hazards analysis in the Kanawha Valley region of West Virginia an area with a very high concentration of chemical facilities.

NICS is characterizing hazardous materials transportation and the potential risk it presents in order to improve emergency response plans in the vulnerable areas of the region. A specific goal of the NICS study is to develop lessons learned for other communities that might conduct a CFS. How can NICS' experience help your CFS? Although the study is not yet complete, several helpful suggestions can be made from the work completed to date. There are several points to keep in mind.

The effort put into a CFS should match the community's goals and its resources. In some cases, a great deal of detail or expense may not be needed for useful emergency planning. NICS' CFS indicates that there are many different types of hazardous materials being transported through the study area. In other communities, hazardous materials transportation may be dominated by a few specific classes of chemicals, such as flammables or corrosive liquids. In these cases, focused hazards analysis and emergency planning efforts may be possible by addressing each of these classes, rather than all of the individual chemicals in each class.

A CFS, however, could show that specific hazardous materials, such as spent nuclear rods or military munitions, are transported infrequently through the community, but pose enough hazard to warrant special attention from emergency planners. Other helpful hints from the NICS study include:

- Hazardous materials transportation can vary by the time of day and the day of the week. Be sure to account for this when planning field surveys.
- Questionnaires mailed to facilities will often require follow-up telephone calls for clarification and to improve the rate of response.
- A CFS that includes many field observation efforts, such as placard or waybill surveys; can generate large quantities of data - computerized data management may be needed or you may wish to scale back the focus of your study.
- Effective training and supervision of field survey personnel will improve the quality of the observations and data collected.
- Shipping papers are often in many different formats. Decide what data you will need and develop a standardized table for entering the information.
- Police and other emergency responders can identify highways and intersections where accidents have occurred in the past to guide data gathering and hazards analysis efforts.
- Incorporate the results of other data gathering efforts. For example, total traffic volume figures developed by transportation agencies can be used to estimate the percentage of vehicles carrying hazardous materials over a given route. These figures can help you address planning issues such as the potential exposure to drivers should a hazmat accident occur during peak travel times.
- Access existing databases and inventories, such as those developed by railroad companies and district offices of the Army Corps of Engineers.

A final guidance document based on the NICS study will he developed upon completion.

Don't re-invent the wheel!

Several agencies at the national and state level compile some of the data that you will need. The advisory committee should identify these agencies and determine what data already exist. This is why having a broad-based advisory committee is so important. Everyone, especially the state DOT representative, will have access to different and valuable information. Industry associations, such as the Chemical Manufacturers Association, the Association of American Railroads, the American Trucking Association, and others may have already collected and analyzed additional data.

Nearby municipalities may have already completed a CFS or may want to join forces and combine resources. For example, LEPC representatives from Alexandria, Virginia, serve on a multi-jurisdictional task force that is an important forum for addressing resource-sharing issues and is developing a transportation hazards-based emergency response plan. The task force is devising a set of response procedures, but is also working to reduce the amount of hazardous materials transported through, and the number of accidents in, the region. You can also integrate your CFS data collection efforts with other on-going data collection or inspection programs. Once again, Alexandria, Virginia, provides an example of effective interagency coordination in its policy of using fire department Title III Facility Data Sheets to highlight likely transportation routes for carriers of extremely hazardous substances. The LEPC incorporates this information on transportation routes and chemicals transported into its emergency planning process to better respond to transportation incidents.

Recruiting outside help.

Using volunteer personnel, students, and local environmental groups can be a great cost and time saver for the LEPC. The Hancock County, Ohio, LEPC took advantage of an innovative program in environmental and hazardous materials management at a nearby university to obtain qualified volunteers for its study on hazardous materials transportation on the county's highways. Following initial training sessions, a total of 37 students from the University of Findlay's "Hazmat Club" were assigned survey times and locations to conduct placard surveys. Their assistance proved to be an important tune saver for the LEPC. A prison inmate volunteering for the Butler County, Kansas, health office, developed and implemented the county's emergency response plan, which included identification of the transportation-related hazards in the county. He spent over 800 hours working on the plan and aiding other counties in developing their plans. He recommends the use not only of inmates, but also senior citizens, who possess the necessary time and knowledge of the region to assist in CFS efforts. Industry is another (perhaps more traditional) potential resource - local industry might be persuaded to contribute personnel and equipment to the study.

A New Funding Opportunity: Utilizing HMTA

Section 17 of the Hazardous Materials Transportation Act (HMTA) provides funds to states to enhance the consideration of transportation-related risks in current chemical emergency planning efforts, and to support the implementation of EPCRA. (There is also an HMTA training grants program, available to both states and tribes.) Conducting a commodity flow study is one of the activities identified by Congress as eligible for funding under the HMTA planning grants program, and could lead to other HMTA activities such as assessing local response capabilities, improving the comprehensive emergency plans required under EPCRA, and assessing the need for regional hazmat teams.

LEPCs should contact the agency selected by their Governor as the "designated agency" for implementation of the HMTA program to learn more about developing a proposal for receiving grant funds under the new law. Call the U.S. DOT HMTA Grants Manager at (202) 366-0001 if you are unsure as to which state agency has been selected to head the effort. Because of HMTA, the, number of commodity flow studies conducted will increase. Keep an eye out for other communities in your area who receive these funds so that you can learn from their experiences as well.

Gathering the Data

What's the big picture?

Begin by identifying the major hazardous materials transportation patterns: determine the general types of hazardous materials moving throughout the community, how they are moved, and when they are moved. A CFS doesn't have to provide a lot of detail to be useful - given budget constraints, collecting exhaustive data on every chemical and every mode of transportation will be nearly impossible to accomplish. Complicated risk analyses using intricate mathematical formulas are probably not necessary. Rough estimates of hazardous materials traffic can provide valuable information in determining where risk lies.

Priority risk areas can be found at the points of origin or destination of hazardous materials, as well as at intermediate locations. For most areas, data for one month, or even one week, may prove sufficient to project the year-round flow of hazardous materials. You can focus on general classes of chemicals (e.g., flammables, corrosives), unless you know that large quantities of specific chemicals are manufactured or stored in the area. Some areas will experience seasonal changes (e.g., a rural community may experience an increased flow of fertilizers and pesticides during a portion of the year) that should be evaluated separately from typical flows. Seasonal patterns may be easy to determine for local industry, but keep in mind that such pat terns will be extremely difficult to track for interstate traffic. You should weigh the costs and benefits of studying seasonal transportation patterns in your area.

Your next step.

Reviewing all of your facilities' Tier II reports and the amount of hazardous chemicals they store, handle, or use annually will give you an idea of the quantity and type of materials transported through your jurisdiction. A fixed facility representative may be able to provide you with a rough estimate of the types and quantities of materials transported through these facilities, or you may decide to prepare a facility questionnaire. NICS prepared a comprehensive fixed facility survey as a starting point for its hazardous materials transportation survey. NICS asked fixed facilities about specific trends in the amount of hazardous chemicals shipped over the past few years, the exact mode of transport and the usual hours and days of the week for shipping and receiving. Facilities were asked to list the major carriers for each chemical and the most frequent origins and destinations of loads. This information provided data on the actual amounts and types of hazardous materials shipped from or received by facilities in the region. It provided valuable information on the general routes utilized by these facilities and yielded transportation data which could be compared to data obtained by the field surveys. See page 6 for the specific steps taken by the Taylor County, Wisconsin LEPC. There are transportation depots that are not necessarily captured under the fixed facility definition in EPCRA, yet hazardous materials are channeled through them every day. Make sure that your CFS includes truck terminals, seaports, airports and rail yards. Such depots may also warrant study in the CFS because of the potentially diverse types and amounts of substances that are distributed from them. Many of these facilities voluntarily participate in the planning efforts of the communities in which they are located. If you feel more formal mechanisms are needed, however, there are provisions of EPCRA that can help.

Section 302(b)(2) of EPCRA authorizes the Governor and/or the SERC to designate “additional facilities which shall be subject to the requirements of [section 302]....” Rail yards, sea ports, and airports are examples of transportation depots that can be included under section 302. You should review your state and local ordinances for provisions (similar to EPCRA section 303(d)(3)) that provide access to the information you need to adequately address the transportation-related risks facing your community.

On A Shoe-String Budget – Collecting the Data

Taylor County, Wisconsin, is a primarily rural community, with a small city and several villages. There are three state highways, one railway, one small airport, and two pipelines within the county. The Taylor County, Wisconsin LEPC conducted a CFS and transportation hazards analysis using the steps outlined below. You might find them useful when setting out to collect data for your community. As Taylor County learned, conducting a CFS is a time-consuming process, but certainly manageable once priorities have been set. By working on the project as time allowed, Taylor County was able to keep the total costs down. Over the course of twelve months, two people worked a total of approximately 450-500 man hours.

1. Identify HAZMAT Routes

Taylor County started by pulling out local maps to determine which routes warranted study. You can use state highway maps, county aeronautical charts, and municipal street maps to name a few. Remember that pipelines might not appear on a map, but need to be included in your CFS. Taylor County contacted pipeline companies directly, after obtaining contact information from the County Emergency Government Office and the State Office for Emergency Preparedness.

2. Determine What HAZMATs Are Carried on Each of These Routes

Taylor County used the following methods to determine hazmat traffic volume and flow.

Route:	Method of Determining HAZMATs:
HIGHWAYS	• Sent questionnaires/surveys to trucking companies, weigh stations, and known hazmat suppliers/users; • Determined data collection points (priority/high-risk points); and • Performed traffic counts (placard survey).
RAILROADS	• Contacted the local representative from railway companies; • Researched waybills and manifests; and • Contacted the District Office of the Federal Railroad Administration in your area.
PIPELINES	• Contacted local pipeline companies; and • Contacted local utility commission for permitting records and “digsafe” programs.
AIRPORTS	• Contacted airport managers to determine which airlines carry hazmats; and • Contacted local representatives for each airline identified.

There are no navigable waters within Taylor County. The LEPC suggests, however, that you contact shipping companies and the district offices of the U.S. Coast Guard and the Army Corps of Engineers to obtain information on the hazardous materials transported through your jurisdiction via waterways. (Check your phone book for local listings.)

3. Compile Accident Records

Finally, Taylor County examined accident histories to identify any recurring problems or severe risks in the area. The following agencies can assist you in collecting information on your area’s accident history

State Department of Transportation		Police Department	Public Health Department
State Emergency Management Agency	Local industry	News media	Local hospitals and physicians

HMIS reports can be obtained by contacting DOTs Research and Special Programs Administration (see page 11 for contact information).

Other facilities that can generate substantial highway hazardous materials traffic include oil-fired, coal, and nuclear power plants; large manufacturing facilities; agricultural warehouses; waste management companies: and public facilities. Keep in mind that the lack of standardized shipping manifests, not to mention receiving them in different languages will complicate your analysis.

Your area's accident history is another key starting point for information.

Federal and state agencies compile accident data that can be used to get a sense of what and where the priority points are and what kind of accidents your community typically faces.

You can use this information, along with your knowledge of local conditions, to help identify high-risk areas.

The U.S. Department of Transportation Hazardous Materials Information System (HMIS) contains a variety of data regarding the transportation of hazardous materials by air, highway, rail, and water.

HMIS also contains a data base on shipping routes for high level radioactive materials that may be of interest in assessing your transportation-related hazards.

The HMIS Incident Report Data Base is composed of carrier-reported accidental release data from 1971 to the present, as required by the Code of Federal Regulations (49 CFR Part 171).

The incident data include the date of incident, chemical(s) involved, quantity, location and land-use, cause of release, mode of transportation, and other information.

Addressing Your Additional Data Needs

Once you have tracked down existing information, how do you obtain the data that are missing? Again, assembling the proper team is crucial. A data collection team may be composed of members of the advisory committee; or, if resources allow, it might be wise to develop an "outside" team. Whether it is made up of private organizations, volunteers from environmental groups and local universities, or contractors, the data collection team should receive a clear mission, adequate training, a timetable, and responsibilities from the advisory committee.

Commodity flow studies commonly involve a road-side placard survey. These surveys identify what materials are being transported and also give you an idea of the quantity involved. Usually, these surveys last for a few days or weeks - observers note the number of trucks that pass by, their placards, the time, and the type of container used. Although a great deal of effort may be needed to make such a survey statistically accurate, even a modest program of field observation can form a solid foundation for conducting a transportation hazards analysis.

The table describes this and other collection methods that have been used in the past by communities identifying transportation-related risk. These methods can be adapted to local conditions and specific modes of transportation. The resources identified can help you determine which methods are appropriate for your study. Whatever method you choose, the advisory committee should organize the raw data that have been collected into a form that is conducive to continuing analysis.

Survey Methods		
METHOD	ADVANTAGES	DISADVANTAGES
Review and analyze existing data	Inexpensive, shows major highway, rail, air, and water routes. Good starting point.	There is no single source for all existing data. Allow time for integrating various electronic formats.
Placard Survey	Provides approximate counts for trucks on major highways and rail lines at reasonable cost. Can be combined with existing data to estimate proportion of trucks with hazardous materials on major highways.	Limited number of roads/rail lines can be covered.
Photocopy survey (Photocopying shipping manifests of carriers passing through toll booths, etc.)	Can provide detailed data on volume and nature of hazardous materials shipped by truck.	Shipping papers are not standardized; requires a lengthy review process. Cost may be prohibitive.
Fixed facility survey	Good data on routing, volume, and nature of hazardous materials.	Only covers a portion of shipments on selected highways; must be supplemented to obtain local shipments.
Weigh Station survey	Good data on routing, volume, and nature of hazardous materials.	Only covers shipments originating or terminating locally. Allow for lengthy dam review sessions.

What to Do With the Results

Improving response; preventing accidents

Many communities have conducted hazards analyses to develop and revise emergency response plans based on the specific hazards found at fixed facilities within their jurisdiction. The hazards analysis process can also be applied to transportation-related risk. The Technical Guidance for Hazards Analysis ("Green Book") describes the hazards analysis process in detail. It can be summarized in three basic steps:

- Hazards identification pinpoints the location, quantity, storage conditions, and the specific hazards posed by the hazardous chemicals transported, manufactured, stored, processed, and used in the community.
- Vulnerability analysis locates geographical areas and the people, property, services, and natural areas that may be affected by a release.
- Risk analysis provides a basis for LEPCs to rank specific release scenarios or locations based on the likelihood and severity of the release. The hazards analysis method described in the Handbook of Chemical Hazard Analysis Procedures ("Brown Book") separates this step into two steps, consequence analysis and risk analysis. The additional step is simply an elaboration of the process explained in me Green Book.

A commodity flow study is, in effect, the hazards identification step of the hazards analysis process conducted for transportation-related hazards. Once the CFS has been completed, you will have a good sense of what major categories of hazardous materials are transported through your region and what the priority areas are - you will have identified the transportation hazards facing your community. Plotting the information on a map can provide a picture of where the hazardous materials are and which are the major routes of concern for planning purposes.

You can use the vulnerability and risk analysis steps described in the Green Book to translate the results of the CFS into recommendations for revising your emergency response plan and determining your community's specific preparedness, prevention, and response needs. This evaluation will help answer important planning questions such as:

- Just how vulnerable is your community to these risks?
- How can risks be reduced?
- How can accidents be prevented?
- What special populations (e.g.. schools, hospitals) are located near these priority routes?
- Are any of these routes marked by significant congestion at certain times of the day?
- What is the response time of the closest hazardous materials team?
- How accessible is the area to emergency vehicles?
- What is a realistic scenario, given the risks and probabilities?

Once the remaining steps in the hazards analysis process have been completed, you can then turn to assessing your level of preparedness and revising your emergency response plan to reflect the highest transportation-related risks. Depending on your circumstances, you may not be able to tailor your emergency response plan to focus on specific chemicals or routes.

Just as with fixed facility planning, budget constraints come into play as the number of chemicals and hazards increase. It is important, however, that your plan addresses the risks that you have identified to the best of your ability. For example, if you discovered that the local railroad terminal stores hazardous materials cars in special holding areas, obtain a map of the facility, mark the holding areas, and attach it to your emergency response plan: then work with the rail-yard to reduce the risks. Another example is segregating incompatible cargoes and establishing buffer zones between holding areas and nearby communities.

After developing a realistic picture of the hazards that your community faces, you can begin to re-evaluate your community's prevention strategies. Are current measures appropriate? Would traffic control on priority routes make a difference'? Do accident records suggest a need for driver safety training'? Would commodity flow restrictions during severe weather alerts make sense? Be sure to identify all of your community's prevention concerns so you can ask the "right" questions.

The CFS may also point to a need for additional resources to increase the community's level of preparedness (e.g., training, equipment, and on-going planning). Again, it is most important to have general response capabilities, rather than trying to address every specific chemical and/or transport route.

Looking Ahead

Transportation-related risks are continually changing, and to meet the challenges that these hazards present, it is important to look forward. With construction of new highways, changes in the composition of local industry, and the enactment of new federal, state, and local laws, there may be a change in the flow of hazardous shipments through your community. The commodity flow study should not "sit on a shelf:" it should be updated periodically and the community emergency response plan revised accordingly.

It is important to keep abreast of new tools (both technological and legislative) that are being developed and refined to address many of the problems you may be facing. Keeping these and other factors in mind will help you with long-term planning and future updates of the CFS and the overall emergency response plan. Let's look at a couple of these innovations and see how they might be applied to your needs.

Metropolitan Planning Organizations (MPOs)

Section 134 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) calls for me designation of an MPO for each urbanized area of greater than 50,000 people. The primary responsibility of these MPOs is to conduct the transportation planning process for the area that it covers. This process will include developing transportation plans and programs to promote comprehensive solutions to regional problems.

MPOs represent a potentially invaluable resource for your LEPC when preparing a CFS. They will have data and expertise that will make your task easier, and they may even be able to provide access to equipment and techniques, such as transportation-specific Geographic Information Systems (GIS), that will simplify the work and enhance the form of your final product. Keep in mind that the MPOs will be working closely with state and local transportation authorities, so that they will likely have information for your area.

Intelligent Vehicle/Highway Systems (IVHS)

IVHS are a family of technologies that are presently being developed to improve transportation safety and efficiency. By bringing high-tech solutions in the form of advanced computers, sensors, and communication systems to some of the complex transportation problems that confront us, IVHS holds the promise of mitigating congestion, enhancing safety, promoting economic productivity, and minimizing environmental hazards.

"Great," you might say, "but how will this sci-fi stuff help me?" In the near future, trucks and trains traveling through your community could be carrying electronic equipment that identifies the cargo, keeps track of the vehicle's location, and even projects the intended route through your district. Shipments of hazardous materials could be tracked in "real-time" by a traffic control center, and sensors on the vehicle itself will be constantly monitoring the condition of the cargo.

Currently, there are over 20 operational programs in the U.S. testing various elements of IVHS, including those directly applicable to hazardous materials transport. Remember that transportation planning is an evolving discipline, and that new tools are constantly being developed to help you safeguard your community.

In Summary...

Even though the transportation of hazardous materials presents substantial risks, these risks may seem difficult to quantify. The commodity flow study process should be tailored to meet your needs and available resources as you identify and address the particular hazards facing your community.

In this document, we have:

- Outlined the steps necessary to conduct a comprehensive commodity flow study;
- Explained how each of these steps relate to the emergency planning process;
- Pointed out some resources you may want to tap once you have decided to go ahead with a CFS; and
- Examined the technologies and issues that will play a role in identifying transportation hazards in the future.

Use this information as a guideline, but remember that there is no one right way of doing this job. The particulars of your community will ultimately determine your best course of action.

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EPA 550-F-98-015, April, 1998

INTEGRATED CONTINGENCY PLAN ("ONE PLAN") GUIDANCE

The National Response Team announced the "one-plan" guidance for integrated contingency planning in June 1996.

EPA and four other agencies signed the guidance, which gives facilities a common-sense option for meeting multiple emergency planning requirements under nine different regulations.

The guidance is an outgrowth of the 1994 Presidential review of federal authorities related to hazardous materials accident prevention, mitigation, and response. That review identified multiple and overlapping facility emergency response plans as a problem area.

Within the guidance document is a core facility response plan for releases of oil and hazardous substances.

Plans prepared by facilities in accordance with the guidance will satisfy requirements of the five participating agencies and will be the federal preferred method of such planning. This one-plan approach will minimize duplication of effort and unnecessary paperwork burdens.

The National Response Team (NRT) has developed Integrated Contingency Plan (ICP) Guidance.

This guidance (also known as "One plan" guidance) provides a way to consolidate multiple plans that a facility may have prepared to comply with various regulations, into one functional emergency response plan.

The ICP Guidance resulted from recommendations in the December 1993 NRT Report to Congress: A Review of Federal Authorities for Hazardous Materials Accident Safety.

The NRT received input from representatives from state and local agencies, industry, and environmental groups prior to developing the guidance.

WHICH AGENCIES DEVELOPED THE ICP GUIDANCE?

Five agencies signed the one-plan guidance: The Environmental Protection Agency (EPA), the Coast Guard, the Occupational Safety and Health Administration (OSHA), the Office of Pipeline Safety of the Department of Transportation (DOT), and the Minerals Management Service (MMS) in the Department of the Interior.

The NRT and the agencies responsible for reviewing and approving federal response plans to which the ICP option applies agree that integrated response plans prepared in accordance with this guidance will be acceptable and will be the federally preferred method of response planning.

WHAT IS THE PURPOSE OF THE ICP GUIDANCE?

The ICP Guidance is to:

- Provide a mechanism for consolidating multiple facility response plans into one plan that can be used during an emergency
- Improve coordination of planning and response activities within the facility and with public and commercial responders
- Minimize duplication and simplify plan development and maintenance

WHICH REGULATIONS DOES THE ICP GUIDANCE COVER?

Rather than a regulatory initiative, the ICP document is guidance.

It presents a sample contingency plan outline that addresses requirements of the following federal regulations:

- The Clean Water Act (CWA) (as amended by the Oil Pollution Act [OPA]) Facility Response Plan Regulations (EPA, Coast Guard, DOT, MMS)
- EPA's Risk Management Program Regulation, Oil Pollution Prevention Regulation, and the Resource Conservation and Recovery Act (RCRA) Contingency Planning Requirements
- OSHA's Emergency Action Plan Regulation, Process Safety Management Standards, and the Hazardous Waste Operations and Emergency Response (HAZWOPER) Regulation

WHICH FORMAT?

A facility may use the ICP sample format or use an alternate format.

The ICP sample format includes the following three sections:

- Plan introduction
- A core plan that serves as the primary response tool
- A series of annexes that provide more detailed supporting information and regulatory compliance documentation

The ICP sample format is based on the Incident Command System (ICS).

Organizing an integrated contingency plan according to the structure of the ICS will allow the plan to dovetail with established response management practices.

This should promote its usefulness in an emergency.

CROSS-REFERENCES

The ICP Guidance supports the use of linkages (i.e., references) to facilitate coordination with other facility plans and with external plans such as local emergency planning committee (LEPC) plans and OPA Area Contingency Plans.

When a facility submits a plan for federal agency review, it must provide a table indicating where the regulatory required elements can be found in the one-plan format.

The ICP Guidance includes tables that cross-reference the requirements of individual regulations with the ICP sample format.

The NRT intends to continue promoting the use of the ICP Guidance by regulated industries and encourages federal and state agencies to rely on the ICP Guidance when developing future regulations.

The ICP Guidance was published in the Federal Register on June 5, 1996 (61 FR 28642).

EPA 500-F-95-001, March, 1995

THINKING ABOUT DELIBERATE RELEASES: STEPS YOUR COMMUNITY CAN TAKE

HOME

Recent incidents, such as the deliberate chemical release in Tokyo, Japan, highlight the need to ensure that local emergency response plans consider this possibility however slight it may be. The United States government has structures and mechanisms in place to address situations like the Japanese subway incident. However, state and local authorities and first responders need to be well prepared.

Under the Federal Response Plan {FRP), the U.S. Public Health Service (PHS) would provide the lead for coordinating a federal effort for health and medical services. It would be supported by the Environmental Protection Agency (EPA) in conjunction with the Federal Bureau of Investigation (FBI), the Department of Defense (DOD), and other agencies.

This bulletin's objective is to bring to your attention how your local emergency plan review process can address deliberate releases and to provide suggestions for rapid action. This bulletin should not cause undue alarm about the likelihood of deliberate releases (as they remain highly improbable events). Throughout the plan review process, the Local Emergency Planning Committee (LEPC) should coordinate with focal fire, police, and health and environmental departments, hospitals, and other government agencies and organizations that may play a role in responding to a deliberate release.

Most of the elements contained in your emergency response plan are directly applicable to a deliberate release scenario. Some key differences remain, however. The following section suggests areas of your emergency response plan that may need additional development.

The FRP, coordinated by the Federal Emergency Management Agency (FEMA), provides a structure for federal assistance: For a deliberate release, the PHS within the Department of Health and Human Services (Emergency Support Function (ESP) #8 - Health and Medical Services) would lead a coordinated federal effort. The Environmental Protection Agency (ESP #10 - Hazardous Materials) would assist ESF #8. Each ESF provides mechanisms for delivering federal assistance. ESP #10 integrates the efforts of the federal Regional Response Teams functioning under the National Oil and Hazardous Substances Contingency Plan (NCP).

The checklist below is not intended to be exhaustive. However, it should trigger taking another look at your plan to ensure that it meets special needs. We suggest that an LEPC meeting is an appropriate way to address this matter.

PREVENTION, PREPAREDNESS, AND RESPONSE

First Steps

- Determine if there are independent efforts in your community addressing deliberate releases (e.g., by the police and fire departments), and if so, coordinate these efforts with community emergency response planning efforts.
- Assess the likelihood of a deliberate release and potential locations, such as transportation facilities, water treatment plants, and natural gas facilities, where a release may occur in order to focus planning.

Training and Equipment

Ensure that your plan:

- Requires personnel to be trained to respond to a broad range of incidents, including deliberate releases. (Training should include exercises with deliberate release scenarios.)
- Identifies access to personnel trained to use appropriate personal protective equipment and to early out response and clean-up activities.
- Identifies access to personnel familiar with risk communication techniques. (Training may be obtained from EPA and FEMA for example.)
- Identifies access to appropriate equipment to respond (e.g., special monitoring and protective equipment). (The State representative on the Regional Response Team may be able to assist in this process.)

Alert and Notification

Ensure that your plan:

- Encompasses mechanisms to identify whether a release is deliberate.
- Addresses procedures to notify the proper federal (e.g., the National Response Center), state, and local authorities.
- Outlines a mechanism to contact the Governor or other officials who might declare an emergency.
- Includes rapid notification procedures for contacting the health department, local hospitals, and other medical facilities to prepare for the possible decontamination of individuals exposed to extremely hazardous substances (some of which may be extremely uncommon) and to provide patient management services.

- Outlines procedures for rapid and continued communication with all critical parties from local fire, police, and health departments to special federal response entities.
- Addresses how to rapidly warn residents of the threat or occurrence of a deliberate release without causing undue alarm.
- Considers in place protection/evacuation procedures.
- Addresses additional security measures to be taken in and around the community at risk.

Site Emergency Procedures

Ensure that your plan:

- Provides for special security clearances for field personnel and others entering key facilities.
- Allows for periodic communication to the community on the status of the situation.
- Highlights personnel and procedures for access control, rumor control, and evacuation control.
- Provides for communication with nearby sites and facilities that may also be 'targets of deliberate releases.
- Provides for additional experts to remain in contact with federal and state entities, not typically involved with hazardous material response efforts, but with an informed interest in and responsibility for deliberate release scenarios (e.g., FBI).
- Identifies specific state and federal resources to be accessed.

Re-entry

Ensure that your plan:

- Identifies access to expert advice and procedures concerning decontamination techniques for clean-up of uncommon extremely hazardous substances.
- Discusses the unique aspects of re-entry into the affected area, such as the possibility of additional threats or incidents.
- Outlines procedures for rapidly releasing information to the public and media regarding re-entry.

Remember that your existing emergency response plan address.es many of the issues that you will need to consider, but additional efforts now will allow you to respond immediately to the particular threats and risks involved with deliberate releases.

In the event of an intentional release of an extremely hazardous substance, contact the National Response Center. 1-800-424-8802.

For additional information, contact your State Emergency Response Commission or State representative on the federal Regional Response Team.

EPA 500-F-01-005, August, 2001

LEPCs AND DELIBERATE RELEASES: ADDRESSING TERRORIST ACTIVITIES IN THE LOCAL EMERGENCY PLAN

HOME

In recent years, the threat of terrorist incidents involving chemical and biological materials has increased. Local emergency planning committees (LEPCs) should consider the possibility of terrorist events as they review existing plans and consider how to incorporate counter-terrorism (CT) measures into their plans. CT planning and preparedness is often an extension of existing activities, rather than a totally new effort. This factsheet discusses how LEPCs can incorporate CT issues when they review and update their local plans. This factsheet builds on the National Response Team's Hazardous Materials Emergency Planning Guide (NRT1) and supersedes "Thinking about Deliberate Releases: Steps Your Community Can Take."

BUILD ON CURRENT ACTIVITIES

Local emergency planning committees (LEPCs), established under the Emergency Planning and Community Right-to-Know Act (EPCRA), prepare and maintain comprehensive emergency plans. These plans address the extremely hazardous substances listed under EPCRA as well as thousands of hazardous chemicals for which OSHA requires Material Safety Data Sheets. Many LEPCs are already addressing CT, even if they do not use the word "terrorism." If you have developed a plan for possible accidental releases of chemicals in your community, you can use the same general planning principles for deliberate releases caused by terrorists. You may need to spend some time considering biological agents. This factsheet includes some suggestions for how you can modify your current activities to include deliberate chemical and biological releases.

MAINTAIN BROAD-BASED MEMBERSHIP

LEPC membership includes a wide variety of stakeholders, such as elected State and local officials; police; fire, civil defense, public health, environmental, hospital, and transportation officials; representatives of facilities where chemicals are stored or used; community groups; public works departments; and the media. Identify any specific roles each of these groups might have in the event of a terrorist attack. In addition, you might add a few new members who would bring specific expertise during a release involving biological agents (e.g., the coroner, morticians, chemistry and biology labs, university experts).

UPDATE AND REVISE YOUR PLANS

LEPCs should review their emergency response plans annually. Before you begin specific consideration of CT issues, ensure that your emergency plan is up-to-date. Simply adding CT materials to an outdated plan will not create an effective emergency plan. For example, review your plan for outdated contact information, unique hazards presented by facilities that may have been constructed after the emergency response plan was first written, or new public works facilities. Also review the annual inventory reports filed under EPCRA Section 312 to determine if new chemicals or hazards are present in your community.

In addition, check Risk Management Plans submitted by facilities in your community to ensure that you address the specific hazards identified by each facility. After you have generally updated your plan, consider adding information and procedures related to potential terrorist incidents involving weapons of mass destruction (WMD). Table 1 (page 6) defines each type of WMD and explains the consequences and response difficulties associated with each type.

One overall difference in dealing with a WMD incident is that law enforcement officials will be involved in the response as investigators. Officials from local, State, and Federal agencies will be on the scene of an incident to collect evidence and interview survivors. Their priorities may create emergency response coordination challenges that your LEPC should address in its plan.

This portion of the factsheet suggests changes you can make to specific sections of your emergency plan.

Emergency Contact Information

In the event of a terrorist incident, rapid and secure communications will be crucial to ensure a prompt and coordinated response. Your plans should include current contact information for fire, emergency medical services (EMS), law enforcement, medical, and other local departments and supporting organizations. Contact information for State officials, including those at public health agencies, the State Emergency Response Commission (SERC), State Police, and emergency management agencies also should be included.

The emergency assistance telephone roster in your emergency response plan should include regular phone numbers, cell phone numbers, pager numbers, and other emergency contact information for those individuals (Federal, State, local, and private sector) who have specific CT functions. The National Response Center (NRC) continues to be the sole Federal point of contact for reporting oil and chemical spills, and now provides the service of the Chemical and Biological Hotline. The NRC telephone number (800-424-8802) should be part of your emergency plan. NRC Duty Officers take reports of actual or potential domestic terrorism and link emergency calls with the Department of Defense (DOD) for technical advice on dealing with weapons of mass destruction and with the FBI to initiate the Federal response actions. The NRC also provides reports and notifications to other Federal agencies as necessary. All local plans should also include contact information for the local FBI Field Office.

Response Functions

Incident Command/Unified Command. Your emergency plan should address direction and control of responders in the event of terrorist attack. Local responders respond to an incident scene and should notify local, State, and Federal authorities if terrorism appears to be involved. Local response authorities (such as a senior fire or law enforcement official) should establish control of the incident scene. The Incident Command System (ICS) that is initially established will likely transition into a Unified Command (UC). The UC structure used at the scene will expand as mutual-aid partners, and State and Federal responders arrive to assist with response operations.

The FBI is the overall Lead Federal Agency (LFA) for a domestic terrorist incident involving WMD and will lead the crisis management activities (including law enforcement activities) of the response.

The Federal Emergency Management Agency (FEMA) is the lead agency for coordination of Federal support to State and local responders during consequence management activities of the response. Although the FBI is always involved in response to a credible terrorist threat or attack, FEMA support is provided only after a Presidential declaration, typically after State and local agencies request their assistance. Consequence management includes measures to protect public health and safety after an explosion or release; restore essential government services; and provide emergency relief to governments, business, and individuals. When crisis management activities have been completed, the U.S. Attorney General may transfer the overall Lead Federal Agency role to FEMA. EPA, the Department of Health and Human Services (DHHS), and DOD also have specific CT-related functions. EPA's role in counter-terrorism activities is described in a factsheet by that name, available at www.epa.gov/ceppo/ct-publ.htm#factsheet.

Public Information. Rapid and secure communications help to ensure a prompt and coordinated response to terrorist activities. Therefore, strengthening communications among emergency responders, law enforcement officials, clinicians, emergency rooms, hospitals, and mass care providers is extremely important. Your emergency plan should include the use of accurate and timely public notification measures and warning systems in the event of a terrorist attack. Work in advance with local news media representatives to ensure their cooperation at the time of an incident. Ongoing communication of accurate and up-to-date information will help calm fears and limit the effects of the attack. The FBI will establish a Joint Information Center (JIC) to coordinate the collection and dissemination of public information.

Activities of human services organizations, such as the Red Cross, should be included in the emergency plan. Among other activities, these organizations may use public information systems to provide human services information to the community, perform crisis counseling, provide insurance information and assistance, and provide translation services.

EPA's Role in the Federal Response Plan

The multi-agency disaster response program that helps states during and after a disaster is the Federal Response Plan (FRP), which groups Federal assistance into 12 functional areas called Emergency Support Functions (ESFs). EPA is the primary agency for ESF 10, Hazardous Materials, which provides for a coordinated response to large-scale releases of hazardous materials by incorporating the response mechanisms of the National Contingency Plan (NCP). EPA assists in determining what sort of hazardous substance may be, or has been, released in a terrorist incident, and follows up with response to the incident, assisting with environmental monitoring, decontamination, and long-term site cleanup.

Public and First Responder Health and Safety. Your emergency plan should address public health and medical issues as they relate to terrorist events. The plan should include procedures to identify and treat victims, store and distribute antidotes, and handle fatalities. Mass care issues that may be different during a terrorist WMD event include decontamination, multi-hazard/multi-agent triage, mortuary services, and notifying and working with families of any fatalities.

The emergency plan should also consider the personal safety of emergency responders in the event of a terrorist attack. A terrorist chemical, biological, or radiological release may not be immediately known or apparent. Caregivers, emergency response and law enforcement personnel, and other first responders are in danger of becoming casualties before anyone realizes that a crime has occurred. Incidents could escalate quickly from one scene to multiple locations and jurisdictions.

The emergency plan should be flexible enough to accommodate evacuation or in-place sheltering. Evacuation may be required outside the perimeter of the scene to guard against further casualties from contamination by a released agent or from the possibility of additional WMD. In-place sheltering may be required if the area must be quarantined or if people are safer in a particular location.

Hazards Analysis

The hazards analysis section of an emergency plan should identify potential hazards, determine the vulnerability of an area as a result of hazards, and assess the risk of a hazardous materials release or spill. In the identification step, you should consider explosive, chemical, biological, and nuclear WMD as potential hazards.

As you conduct your hazards analysis, identify potential targets and review their vulnerability to attack. Consider the population, accessibility, impact on daily life, economic impact, and symbolic value of areas at risk. Terrorists and criminals who want to attack a particular group based on a conflict with their personal beliefs might target Federal, State, or local government offices and facilities, health clinics, or religious structures. Those who want to cause maximum casualties might target public gathering places (such as sports and entertainment complexes or tourist attractions), modes of transportation (such as buses and trains – including subways), routes of transportation (including bridges), or transportation facilities (such as airport terminals). In order to damage infrastructure and interrupt day-to-day functions, a terrorist might target utilities or water and wastewater treatment plants. LEPCs should also consider emergency procedures in the event of multiple, or simultaneous, terrorist attacks. Terrorists might target first responders (e.g., fire houses, police department offices, response vehicles, and individuals) to hinder them from responding to another terrorist incident. A terrorist may seek to transform a target into a weapon by focusing on facilities that handle explosive, toxic, or volatile chemicals.

Because most public buildings and public areas must be accessible to everyone, they are highly vulnerable to attack. Other facilities, such as water treatment plants and industrial facilities, especially those with chemical or explosives storage, should have site security measures in place. You may want to discuss site security measures with these facilities to ensure that they are adequately protected. You may want to ask the facility the following questions:

- Is the facility or critical equipment and chemicals protected by fences or buildings?
- Are there systems to detect intruders (e.g., patrols, video surveillance)?
- Are there alarm systems?
- Is access to the critical areas controlled?

Do not, however, include details of the security systems in your emergency plan, because it is available to the general public.

Public works facilities and workers will assume a support role, if so requested by State and local agencies. This support role might include damage assessment, debris clearance, search and rescue, traffic control, restoration of lifeline systems, building inspection, provision of potable water and sanitation services, and flood control.

For more information on site security, read CEPPO's Chemical Safety Alerts Chemical Accident Prevention: Site Security (EPA K-550-F00-002) and Anhydrous Ammonia Theft (EPA-F-00-005), available at www.epa.gov/ceppo/p-small.htm#alerts.

Mitigation Procedures and Ongoing Assessment

Mitigation procedures and ongoing assessment involve consequence management activities to assess and protect the public from further exposure to hazards presented by terrorist activities. Public health officials, hazmat teams, coroners and/or medical examiners, and criminal investigators should work together to mitigate residual hazards as well as identify potentially large numbers of fatalities. Federal assistance should be available to support this task. Ongoing assessment activities may include environmental sampling of air, water, and soil, and insect and animal screening for chemical, biological, or radiological agents.

The criminal investigation of a terrorist attack will be a joint effort that includes many agencies. In the event of a biological attack, an epidemiological investigation may also be performed to assess the distribution of cases and sources of outbreak. The emergency plan could include a checklist of basic questions to ask when conducting interviews with victims in hospitals, sick officers, and other individuals in affected population groups. (It may be necessary to train people in how to ask such questions appropriately in stressful circumstances.)

Equipment

Your emergency response plan should include standard operating procedures on when to use specialized WMD response equipment. Local responders should be trained to use, maintain, and calibrate this specialized equipment. The Department of Justice's Office for State and Local Domestic Preparedness Support (OSLDPS) provides equipment grants and technical assistance to eligible communities. Visit their website at http://www.ojp.usdoj.gov/terrorism/funding.htm for more information and grant application kits.

Training

The 1996 Nunn-Lugar-Domenici (NLD) legislation authorized funding to form a Domestic Preparedness (DP) training initiative. This initiative was recently transferred from DOD to the Department of Justice (DOJ), and includes a range of specialized courses, from basic awareness to discipline-specific advanced level training and exercises.

Training is available for identified cities and is directed at a broad spectrum of emergency responders from a variety of response disciplines, including fire, hazardous materials, law enforcement, emergency medical services, public health, emergency management, and public works. Additional advanced level courses involving the use of real-time experiences, live agents, and explosives are taught at cutting edge training facilities.

The NLD DP Program also includes three exercises: a chemical weapons tabletop, a biological weapons tabletop, and a chemical weapons full-scale exercise. Both types of exercises allow participants to test their knowledge and training, as well as increase the overall preparedness of responders across the jurisdiction. FEMA independently offers the following:

- Course materials on WMD and preparedness and response for terrorist incidents that can be downloaded from www.fema.gov/emi/termng.htm.
- A terrorism consequence management course at their Mount Weather Emergency Assistance Center. Contact the training officer in your State Training Office of Emergency Services for information on course schedules and application procedures. A list of offices and contact information is located at www.fema.gov/emi/sttrgo.htm.
- Information on the Incident Command System (ICS) training conducted by each State Training Office of Emergency Services. Visit www.fema.gov/emi/ nrcrs.htm for more details.
- In conjunction with the National Fire Academy, an independent study course in emergency response to terrorism, located at www.fema.gov/emi/crslist.htm.

RESOURCES

LEPCs seeking assistance in terrorism-related emergency planning should begin with their SERCs. The SERC can direct LEPCs to appropriate assistance at the national and State level, and may be able to facilitate LEPCs in a given region working together to address possible terrorist activities.

There are currently many Federal agencies involved in some aspect of counter-terrorism. Many of these agencies support websites. Because of the continual changes in the world of CT, however, many websites become outdated or are even discontinued without warning. Therefore, we recommend that LEPCs consult EPA's Chemical Emergency Preparedness and Prevention Office (CEPPO) website at www.epa.gov/ceppo/cntr-ter.html. This address is updated every two months and includes the latest links to the following types of information: Federal departments and agencies, health and medical, technical information and resources, and international sources.

Table 1 -- Weapons of Mass Destruction (WMD) Definitions, Consequences, and Response Difficulties

Type of WMD	Definition (according to Title 18, USC 2332a)	Consequences	Response Difficulties
Explosives	Any explosive, incendiary, or poison gas bomb, grenade, rocket ... missile ... mine or device similar to the above	Deaths, injuries, damaged structures	Similar to that of other explosions and large fires
Chemical	Poison gas, blister gas	Deaths, injuries, possible contamination, possible long-term effects	Similar to accidents planned for in current LEPC emergency response plan, but could be more extensive in effect (e.g., VX release in a crowded convention center or school)
Biological	Any weapon involving a disease organism	Deaths, injuries, contamination, long-term, far-reaching geographic effects	Agents may be unknown; Locations may vary and multiply as people travel
Nuclear	Any weapon that is designed to release radiation or radioactivity at a level dangerous to human life	Deaths, injuries, contamination, possible long-term, far-reaching effects	Similar to that of other explosions and large fires plus radiation; could have long-term far-reaching effects

LOCAL EMERGENCY PLANNING COMMITTEES AND RISK MANAGEMENT PLANS: Encouraging Hazard Reduction

HOME

Prepared by: National Institute for Chemical Studies, Charleston, West Virginia, under a cooperative agreement with the U.S. Environmental Protection Agency (#CX 824095)

SECTION 1: INTRODUCTION

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) called for the establishment of local emergency planning committees (LEPCs). LEPCs were established to be broad-based membership groups with the responsibility to receive information from local facilities about chemicals in the community, to use this information to prepare a comprehensive emergency response plan for the community, and to respond to public inquiries about chemical hazards and releases. There are approximately 4,000 established LEPCs in the United States, ranging from single-city to statewide organizations.

Section 112(r) of the federal Clean Air Act requires that facilities that pose the greatest harm to the public and the environment as a result of an accidental chemical release must prepare and submit a risk management plan (RMP) to EPA. The plan must describe the facility's chemical accident prevention program, emergency response program, and off-site consequence analysis (OCA). The OCA must evaluate the potential for hypothetical worst-case and alternative accidental release scenarios. Congress mandated that RMPs be available to state and local governments and the public. As of May, 2001 approximately 15,000 RMPs have been filed with EPA in accordance with the RMP rule (promulgated June, 1996). Both EPCRA and Section 112(r) recognize that planning for and responding to accidental chemical releases is ultimately a local responsibility. Accordingly, LEPCs have a key role in carrying out the intent of the Risk Management Plan program. Since the promulgation of the RMP rule, and the initial submissions of RMPs in June, 1999, issues have been raised regarding how these plans are being used to reduce the potential impacts of accidental chemical releases. Specifically, EPA/CEPPO has expressed interest in identifying how LEPCs might be using the RMP information to encourage facilities within their jurisdictions to reduce or eliminate chemical hazards. The purpose of this study is to identify opportunities and challenges for LEPCs in using the RMP tool to improve community safety, and to highlight those LEPCs that use RMPs to promote hazard reduction. The goal of the study is to develop useful information that can be used by other LEPCs, by State Emergency Response Commissions (SERCs), and by EPA, to more fully take advantage of the RMP program to improve community safety.

Because of the interconnectedness between RMP requirements and those previously established under EPCRA, many of the hazard reduction activities identified during this study were not driven solely by RMP information but also by LEPC efforts to meet their EPCRA responsibilities. Both are included in this report.

The National Institute for Chemical Studies (NICS), is uniquely qualified to conduct this study. Since 1985 NICS has worked to help communities around the United States manage chemical risks. A significant part of the work of NICS has focused on supporting local emergency managers through training and information. With the support of EPA/CEPPO, NICS convened a focus group of LEPCs from around the country in 1995 to identify challenges and opportunities facing these organizations. The findings of this study were summarized in a report issued in 1995, Focus on the Future of LEPCs. Since that time NICS has continued to support LEPCs through information and training on protective actions during chemical emergencies and on hazardous materials transportation studies. NICS also participates as a member of the Kanawha Putnam Emergency Planning Committee, which is recognized as on of the most active LEPCs in the nation. Additional information about NICS may be found at www.nicsinfo.org. The following report presents the results of the NICS study on LEPCs and their use of the Risk Management Plan program to encourage hazard reduction.

SECTION 2: BACKGROUND

Local Emergency Planning Committee responsibilities under EPCRA

EPCRA establishes the LEPC as a forum at the local level for discussions and a focus for action in matters pertaining to hazardous materials planning. LEPCs also help to provide local governments and the public with information about possible chemical hazards in their communities. Under EPCRA, LEPCs have two primary responsibilities:

1) LEPCs annually review, test, and update emergency plans for their planning district. The plan must include the identity and location of hazardous materials; procedures for immediate response to a chemical accident; ways to notify the public about actions they must take; names of coordinators at chemical plants; and schedules and arrangements for testing the plan through emergency drills.
2) LEPCs also collect emergency release and hazardous chemical inventory information submitted by local facilities (called Tier 2 information) and make this information available to the public upon request.

Risk Management Program requirements under Clean Air Act Section 112(r)

The RMP regulation (40 CFR part 68) is designed to prevent accidental releases to the air of substances that may cause immediate, serious harm to public health and the environment, and to mitigate the effects of releases that do occur. The RMP regulation applies to processes at facilities that have more than a threshold quantity of any of 77 acutely toxic substances, and 63 highly volatile flammable substances. A subsequent law excluded flammable substances from the RMP requirement when those substances are used for fuel or held for sale as fuel at a retail facility. The main elements of facility compliance with the RMP regulation are:

1) A hazard assessment, including a five-year accident history involving the regulated substances and descriptions of the worst-case and alternate-case accident scenarios for those substances;
2) A management system to oversee implementation of the RMP elements;
3) A prevention program to analyze the hazards that are present and describe the systems and practices for managing the risk of a chemical accident;
4) An emergency response program which is coordinated with the local LEPC; and
5) A Risk Management Plan (RMP) that describes these activities.

Information in the RMPs is required to be updated every five years or sooner under certain circumstances, including major changes to the facility or its covered processes. In addition, facilities are required to keep additional supporting documentation on their risk management program on site.

Role of LEPCs in RMP and Hazard Reduction

Local emergency planning committees are not mandated or required to take action under the risk management program established by Section 112(r). However, the 112(r) rule promulgated by EPA offers the opportunity to increase the scope of LEPC activity from just preparing for and responding to releases to taking a proactive role in helping facilities in their communities prevent releases. LEPCs serve as a central point around which emergency management agencies, responders, industry and the community may work together to find solutions to hazardous material risk management issues. As a result, LEPCs may play an active role in RMP-related activities including risk communication, public education, industry outreach, mitigation, and emergency planning. A fundamental goal of EPCRA is making communities aware of hazardous risks so they can take steps to minimize those risks and to prepare for potential accidents. Under this law, LEPCs have the responsibility for increasing hazardous materials safety by educating the public, coordinating emergency planning, training emergency responders, conducting exercises, and reviewing actual responses to releases. This authority allows LEPCs to enhance and refine the information provided under RMP to improve community safety.

The RMP program also provides opportunity for LEPCs to better coordinate their current responsibilities with ongoing industry hazard reduction activities. According to EPA's Guide to Accidental Release Requirements:

> In the broadest sense, risk management planning relates to local emergency preparedness and response, to pollution prevention at facilities, and to worker safety. In a more focused sense, it forms one element of an integrated approach to safety and complements existing industry codes and standards. The risk management planning requirements build on OSHA's Process Safety Management Standard, the chemical safety guidelines of the Center for Chemical Process Safety of the American Institute of Chemical Engineers, and similar standards of the American Petroleum Institute and the American Chemistry Council, as well as the practices of many other safety-conscious companies.

This study was developed to examine how LEPCs may be using their EPCRA responsibilities and the information provided by the RMP program to reduce hazards in the community. EPA has recognized that one of the most important, but not mandated, measures that LEPCs can take is to make hazard reduction or prevention recommendations to industry and local government. In the 1994 national survey of LEPCs conducted for EPA by George Washington University, nearly half (48 percent) of the functioning LEPCs responded that they have taken this step as part of fulfilling their EPCRA responsibilities. The RMP program offers additional opportunity to encourage hazard reduction at facilities based on the hazard analysis and accident prevention requirements of the RMP.

Numerous roles for LEPCs in encouraging hazard reduction have been suggested by EPA and other chemical safety organizations. These have included the following:

1. Potential roles identified in 1992 Texas A&M national LEPC survey (from NICS, Focus on the Future of LEPCs)
   - Use the authority of SARA Title III to get information from private facilities that is needed for planning, through on-site visits, surveys, and other means.
   - Set up meetings with industrial safety management to discuss safety.
   - Set up "good neighbor" agreements or other negotiations with facilities concerning safety and accident prevention.
   - Ask facilities to use methods of accident prevention such as reducing or breaking up volumes of chemicals stored on-site or improving maintenance.
   - Ask local or state agencies to re-route hazardous substance carrier traffic to avoid vulnerable populations.

- Make comments on a proposed land use plan, or new zoning or subdivision ordinance, concerning chemical safety and population protection issues.
- Ask facilities to reduce use of toxic substances by substitution of less toxic chemicals or changes in chemical processes.
- Make comments to a local planning/zoning commission concerning a proposed industrial zone change or land use permit that involves facilities using toxics.
- Create a local zoning ordinance to regulate certain industrial activities using toxics in or near residential or other areas.

2. Recommendations by EPA (from RMPs Are on the Way):
    - LEPCs should work with facilities to reduce chemical inventories, substitute less hazardous chemicals, use inherently safer technologies, and add new prevention measures.
    - LEPCs should develop a public recognition program to honor facilities who have a noteworthy accident prevention program.
    - LEPCs should serve as a forum for the community and industry on accident prevention. LEPCs should meet with industry officials to discuss the off-site consequence analysis, understand the facility's prevention program, and perhaps suggest additional steps to prevent accidental chemical releases.
    - Using the national RMP database, LEPCs will be able to gather information necessary to compare practices at local facilities with other facilities in the same industry in the state or even in other parts of the country. With RMP data from other facilities, LEPCs can make comparisons with a local facility by asking the following questions:
        a. Is the quantity of the chemical the facility is using or storing unusual?
        b. Has the facility identified the same major hazards as similar facilities?
        c. Does the facility have the same kinds of process controls as similar facilities?
        d. Does the facility use the same kind of mitigation systems as similar facilities?
        e. Do facilities in this industry generally have detection systems?

If the facility being reviewed has not listed major hazards that similar facilities have identified, this may indicate a problem with the facility's hazard review or PHA. If it has fewer controls, mitigation systems, or detection systems than similar facilities have, the LEPC may want to talk to the facility about possible changes that could reduce risk. If the local facility does not have certain process controls or detection systems typically used by similar facilities, or if it stores ten times as much of the regulated substance as anyone else, the LEPC may have solid information with which to start a dialogue on risk reduction.

3. Recommendations from AIChE, Center for Chemical Process Safety (from Local Emergency Planning Committee Handbook):
    CCPS recommends several proactive options for LEPC involvement in using RMP data:
    - Use worst case scenarios to pinpoint potential problem areas in the community.
    - Use alternative release scenarios to build decision trees for determining when to call for shelter in place or evacuation.
    - Use alternative release scenarios for preplanning evacuation routes.
    - Use alternative release scenarios for planning drill scenarios and training exercises.
    - Use five-year accident scenarios for planning realistic drill scenarios.
    - Use five-year accident histories for developing LEPC tabletop studies to help understand the best practices and weaknesses from past performance.
    - Systematically begin requesting emergency response plans for review and arrange meetings to discuss them with stationary sources.
    - Target those facilities whose RMPs indicate more attention and request further information such as detailed alternative release scenarios and prevention program data.
    - Approach facilities for assistance in planning out drill scenarios using actual data from their RMPs.
    - Consider revising the community response plan based upon reviews of the plans from each stationary source in the response area.
4. Recommendations by U.S. Public Interest Research Group (from Too Close to Home report):

U.S. PIRG has recommended that LEPCs use RMPs to emphasize accident prevention and inherent safety as an integral part of their activities. Strategies for LEPCs to promote inherent safety and source reduction recommended by the Great Lakes Pollution Prevention and Chemical Safety Project Team include:

- Adopt and implement a policy, goal or mission statement of working toward inherent safety and source reduction.
- Make it a high priority to network with providers of prevention-based technical assistance for industry.
- Introduce inherent safety and source reduction concepts to industry during Risk Management Plan review and plant tours – either themselves or by working with other local agencies such as fire prevention or pollution prevention officials.
- Create opportunities to impart expertise to industry, including better economic analysis methods.
- Publish (or otherwise present to LEPC members, industry, labor, the public, and government agencies) information from footprints/vulnerable zones, Tier 2 inventories, and TRI in order to track

and improve inherent safety and source reduction progress.

- Network or form partnerships with compliance and enforcement agencies and others, such as insurance companies, both in providing incentives for compliance and "beyond compliance" and in enforcement (e.g., increasing the rigor of fire department of other agency inspections of uncooperative facilities.)
- Understand, and where appropriate, take a role in compliance assistance and enforcement. This may involve such activities as LEPC review of emergency response plans, working creatively with State Attorney Generals offices, and Supplemental Environmental Projects (SEPs) in settlements.
- Use community pressure by publicizing which facilities have made progress toward inherent safety, as well as instances of noncompliance or non-cooperation.
- Obtain more (and sustainable) funding for inherent safety and source reduction, including facility fees as an appropriate mechanism. Other funding mechanisms include creative enforcement settlement, networking with other agencies and organizations to use their resources, including in-kind donations of equipment or services.
- Encourage public awareness and participation, including recruitment of LEPC members from community groups, community colleges or school districts, labor, pollution prevention agencies, etc.)

SECTION 3: REVIEW OF LEPC INVOLVEMENT IN RMP PROGRAM AND HAZARD REDUCTION ACTIVITIES

METHODOLOGY

This review was conducted using the case study method, in which NICS examined selected LEPCs to determine their role in the Risk Management Plan program and hazard reduction activities. The specific methodology used included the following steps:

1) NICS reviewed previously published material on LEPCs and on the Risk Management Plan program. This material included EPA guidance documents; previous surveys of LEPCs; reports by other chemical safety organizations; and selected SERC and LEPC websites. A listing of these resources is included in Appendix A.
2) NICS identified LEPCs around the United States that are generally considered "active." The organizations included in this group are those who were identified as meeting or exceeding the EPCRA-mandated duties for LEPCs. This selection was done to develop a representative sampling of LEPCs rather than an exhaustive list of active groups. NICS identified these LEPCs by contacting each of the ten EPA regional CEPP offices and asking for their suggestions of LEPCs that could be described as "active." Additional organizations were identified by reviewing previously published reports on LEPCs and RMPs. Others were identified through referrals from those LEPCs initially identified by the EPA regional offices.
3) NICS contacted the identified LEPCs by letter, followed up by telephone calls. Several of the LEPCs contacted by letter could not be reached or did not return phone calls. The remainder were contacted by NICS by telephone for conversations ranging from 30 minutes to an hour. During these conversations the LEPC contact person was asked to describe their LEPC's general level of activity; involvement in the RMP program; their use of RMP data or similarly available data to encourage hazard reductions at facilities within their jurisdictions; and their opinions on opportunities and challenges for LEPCs in seeking to encourage hazard reductions. A total of 32 LEPCs were contacted for this study; those contacted are listed in Appendix B.
4) NICS summarized the materials reviewed and the conversations with the LEPCs into this report. Included are findings regarding LEPC activity in hazard reduction; conclusions that may be drawn regarding this activity; and recommendations for further action by EPA.

Notes on the methodology

This study was not designed as a comprehensive analysis of LEPC activity across the United States. Given the limitations of time and resources for the study, a representative group of active LEPCs was selected for examination. NICS recognizes that there are likely other examples of LEPC efforts in hazard reduction that are not examined here. It is hoped that this report will lead to additional examples of LEPC involvement being identified and shared. The study was also not designed to be a statistical analysis of this sample population of LEPCs. Because the conversations with the selected LEPCs were designed to be open-ended, and the sample size is too small to draw statistically-significant inferences, the results of the study are expressed in qualitative rather than quantitative terms. Descriptions such as "a few," "some," "many," or "nearly all LEPCs," rather than numbers and percentages, are used to convey the study results.

While NICS believes that the study findings are representative of a cross-section of these organizations, the report is not intended to draw generalizations about the opinions of all LEPCs. Additional input from other LEPCs, SERCs, EPA, and other chemical safety organizations would be most welcomed and would further inform the study of this issue. It was recognized at the outset of the study that LEPCs vary widely across the country in terms of existing hazards, organizational capabilities, and available resources. The examples offered in this report are not necessarily intended as ones that should be replicated by all LEPCs. What works for one organization may not work for another. These examples are offered to suggest ideas that may be adapted for use by other LEPCs, or that may lead to other approaches to hazard reduction. Finally, this study was intended to supplement the findings of the most recent national survey of LEPCs conducted by George Washington University for EPA/CEPPO. However, the results and findings of this survey were not made available to NICS during the project period and thus are not addressed in this report.

FINDINGS

How LEPCs are involved in the Risk Management Plan Program

The LEPCs contacted for this study were first asked to describe their organization's involvement in implementing the RMP requirements. The following is a summary of this activity:

1. Staying informed of RMP requirements
Nearly all of the LEPCs reported that they had made efforts early on to develop an understanding of who was required to file RMPs and what filing requirements existed. This information was obtained predominantly from EPA regional offices, although some LEPCs reported receiving early information from industrial groups and facility members on the LEPC. In addition, a few LEPCs reported that they did not make a significant effort to become informed of RMP requirements because their state did not seek delegation of the 112(r) program and thus they did not expect to have a role in RMP implementation.
2. Helping identifying facilities required to file RMPs
Some of the LEPCs reported that they had used information about RMP requirements to identify facilities within their jurisdiction that were required to file RMPs. In several cases contacts were made with these facilities to ensure they were aware of filing deadlines and requirements.
3. Assisting facilities in preparing RMPs
Some LEPCs state that they served as an information clearinghouse for facilities required to file RMPS, and provided technical guidance to smaller facilities and others that did not have staff expertise in RMP. Two LEPCs – Fayette County (GA) LEPC, and Jefferson County (KY) LEPC – reported hiring consultants to train facilities in complying with RMP requirements. Another LEPC – Springfield (MA) LEPC – reported preparing the RMP for the city wastewater treatment plant.
4. Assisting in public disclosure of RMPs
By far the greatest area of involvement in RMP reported by the LEPCs was in assisting and participating in the public rollout of the plans. Nearly all of the LEPCs stated their belief that this represented an extension of their public outreach responsibilities under EPCRA. In several cases, LEPCs participated in the public meetings when requested to do so by the facilities. In some cases – such as the Clark County (NV) LEPC – a coordinated approach to public presentation of the RMP was developed by the LEPC and provided to all reporting facilities. Some of the LEPCs – such as the Kanawha Putnam Emergency Planning Committee – hosted or sponsored the public rollout of their facility RMPs at a regular LEPC meeting or at a special community event.
5. Working with new facilities to meet RMP filing requirements
In a few instances LEPCs noted that they are working with new facilities in their district to comply with the requirements for filing RMPs.
6. Maintaining copies of RMPs at the LEPC office
Some of the LEPCs reported maintaining copies of RMPs, or the executive summaries of RMPs, at the LEPC office. In a few cases the LEPCs sought out copies of the plans from their reporting facilities; in a few other cases the LEPCs reported that facilities voluntarily provided copies of their RMP to the LEPC. For the most part, however, the LEPCs reported that they did not maintain copies of the plans but could obtain them from the facility if needed. There appeared to be some uncertainty regarding whether these plans were required to be maintained by the LEPC, or whether it was appropriate to do so. This issue is further examined later in this report.

How LEPCs have used RMP and similar information to encourage hazard reduction

Nearly all the LEPCs contacted for this report expressed the belief that encouraging hazard reduction is a logical role for their organizations. Many of the LEPCs reported seeing hazard reduction as appropriate because of their access to risk information and their responsibilities for coordinating emergency planning and response activities.

Much of the reported activity in encouraging hazard reduction is the result of LEPCs exercising their responsibilities under SARA Title III. In these cases, the planning activities which LEPCs are required to carry out, the training and support provided to emergency responders, and the outreach to the public regarding risk information, are viewed as ultimately resulting in safer facility operations and fewer accidental releases. Examples were also identified of LEPCs that have used the RMP information to both indirectly and directly encourage hazard reduction. In these cases, the LEPCs had viewed the RMP as either offering new risk information or supplementing existing information, and providing an opportunity to engage in further dialogue regarding accident prevention and hazard reduction. The following are examples of how RMPs and similar information have been used by LEPCs and other organizations, in both direct and indirect ways, to encourage hazard reduction:

Actions taken pursuant to RMP

1) Providing a forum through the LEPC by which industries present their RMP plans to each other and exchange

information on safety programs (Example: York County, PA LEPC)

2) Using RMP information on chlorine hazards in the community to obtain funding for a chlorine safety training training program for local industries and utilities (Example: Fayette County, GA LEPC)
3) Surveying companies following RMP submittal to identify what changes were made at the facilities to reduce chemical hazards as a result of preparing the RMP (Example: Deer Park, TX LEPC)
4) Requesting quarterly reports from facilities identifying ongoing efforts to reduce hazards and decrease the vulnerable zones identified in the RMP (Example: Community Advisory Committees in La Porte, Pasadena, and Deer Park, TX, in cooperation with the LEPCs)
5) Revising community emergency plans using the RMP program design guidelines, focusing on the greatest chemical risks identified by the RMPs: Chlorine, ammonia, propane, LPG (Example: Honolulu, HI LEPC, through industrial association Campbell Local Emergency Action Network)
6) Revising county emergency plan using RMP by doing GIS modeling of facility hazards and vulnerable zones to pre-determine zones for evacuation (Example: Linn County, IA LEPC)
7) Developing protective action training programs and establishing and upgrading community warning systems (Example: Union County, AR LEPC)
8) Using RMP accident scenario modeling to re-run scenarios previously modeled using CAMEO/ALOHA, in order to present a more realistic assessment of threatened areas (Example: Cuyahoga County, OH LEPC)
9) Using RMP data as justification for establishing a program jointly funded by local industry for the purchase of emergency response equipment to be available for any public or private response agency (Example: Fayette County, GA LEPC)

Actions taken pursuant to EPCRA

1) Conducting inspections of SARA Title III facilities and including a focus on hazard reduction and pollution prevention opportunities (Example: Springfield, MA LEPC)
2) Participating in community fairs to promote hazard reduction and encourage public awareness (Example: Anchorage, AK LEPC)
3) Reviewing and critiquing recent accidents and training exercises to identify lessons learned for future prevention (Example: East Baton Rouge, LA LEPC)
4) Sponsoring industry roundtables and committees as a regular forum to address mutual safety and hazard reduction concerns (Example: Centre County, PA LEPC)
5) Partnering with local industry groups to disseminate information on safety and hazard reduction through regular LEPC meetings and special seminars (Example: Monroe County, PA LEPC)

Examples of Hazard Reductions
Achieved through RMP and SARA Title III

- Allegheny County, PA: Preparation of RMPs for regional wastewater treatment plant and city water plant identified chlorine risk from tank cars parked near a hospital, shopping mall, and downtown business area. Both plants subsequently switched to solid chlorination to reduce risk.
- Honolulu, HI: Wastewater treatment plant changed from chlorine treatment to ultraviolet and chlorine solution treatment. North Central Florida: Local plant reduced ammonia storage from 5 ton containers to 100 pound cylinders after it was determined that larger supply was not needed.
- Harford County, MD: Administrative controls used to reduce chlorine inventory and use at city water plant; Army water plant switched from liquid to powdered chlorine.
- Fayette County, GA: Public pressure resulted in elimination of chlorine storage tank at a new industrial facility built near a residential subdivision.
- Washtenaw, MI: EHS inspection by county and LEPC at local manufacturing facility resulted in reduction of bulk storage of toluene diisocynate from bulk rail storage to “just in time” delivery.
- Springfield, MA: LEPC worked with chemical warehouse to encourage switch from on-site storage of 1000 lb. container of cyanide to delivery only when needed, and worked with local facility to replace sulfuric acid with citric acid in its process.
- Deer Park, TX : Facility reported eliminating 90 tons of ammonia by replacing its refrigeration system, thereby reducing the WCS zone from 8.1 to 1.3 miles.

Factors affecting LEPC role in encouraging hazard reduction

While there was a recognition that encouraging hazard reduction is a logical role for LEPCs, there are many factors identified by LEPCs as obstacles or challenges to carrying out this function. During the course of this study, numerous issues were raised by the LEPCs that were seen as limiting their ability to make any real difference in hazard reduction. These issues represent a wide range of concerns that will need to be addressed if these local emergency planning organizations are to make a meaningful contribution in this area. The following is a summary of these concerns:

1. Lack of mandate under EPCRA or 112(r)
Several LEPCs expressed the belief that there is no mandate for their organizations to play a role in encouraging the reduction of chemical hazards at facilities. EPCRA authority is seen as limiting LEPC involvement to emergency planning and informing the public of risks; hazard reduction is seen as outside the scope of this authority or outside the LEPCs' area of responsibility. 112(r) authority appears to be unclear regarding the role of LEPCs, but there is no perceived mandate in either the RMP statute or rule for LEPC involvement in hazard reduction. The absence of a clear requirement is seen as limiting the ability of LEPCs to gain industry cooperation to jointly pursue hazard reductions.
2. Lack of resources to devote to hazard reduction
Nearly all the LEPCs stated that the greatest obstacle to actively engaging in encouraging hazard reduction is the lack of staff and financial resources. It was continually noted that LEPCs are comprised of volunteers who do not have the time to devote significant effort to hazard reduction. Several of the LEPC contacts pointed out that their role as coordinator or chairperson of the LEPC is in addition to a full-time job or other competing duties.

    In addition, it was reported numerous times during this study that funding is not available for hazard reduction activities, even in states that have assumed 112(r) delegation. This relates to the more fundamental problem that there is no stream of federal funding provided to either LEPCs or SERCs, and they are often quite short of resources to carry out their EPCRA-mandated responsibilities. It was noted that while EPA assumed the Risk Management Plan would be an additional tool to help LEPCs with their EPCRA responsibilities, many and perhaps most LEPCs are struggling to meet the basic requirements of EPCRA, much less promote hazard reduction.

    The lack of resources for LEPCs was cited by EPA in its justification of public disclosure of the Offsite Consequence Analysis in the RMP:

    "In general, LEPCs have not made a concerted effort to bring hazardous materials issues to public attention, focusing instead on technical aspects. Further, given the constraints under which LEPCs operate, it is unrealistic to expect LEPCs to attempt to foster debate of environmental issues or to focus on hazard reduction rather than emergency response." (emphasis added) EPA, Assessment of the Incentives Created by Public Disclosure of Off-Site Consequence Analysis Information for Reduction in Risk of Accidental Releases.
3. Lack of technical expertise
Several LEPCs expressed the belief that they are limited in their ability to encourage facilities to reduce hazards because they lack the necessary engineering knowledge or expertise to identify how chemicals or processes in a plant could be changed. This was expressed by one LEPC contact person as "We are not process engineers or production engineers," and thus do not have the technical background to work with plant personnel who have this full-time responsibility. The lack of technical background was seen as limiting LEPC credibility with plant personnel and management.

    Where LEPCs have experienced some success in working with facilities to reduce hazards – including the Springfield (MA) LEPC, and the Washtenaw County (MI) LEPC – they reported that they were only able to develop this ability through years of experience or by investing significant time in learning the technical aspects of plant operations through "familiarization audits."
4. Unclear about responsibilities in hazard reduction
Several LEPCs also reported that they are unclear of what responsibilities they are expected to assume regarding hazard reduction, and how those responsibilities might be carried out given the limited resources available to LEPCs. Along the same lines, several LEPCs said they were unclear about their role in the Risk Management Plan program, and that neither the statute nor the rule made this clear. It was noted that additional guidance from EPA is needed on how they are expected to participate, and that this guidance should be developed in consultation with LEPCs.

    As an example of the concern created by this perceived lack of guidance, one LEPC noted that during the rollout of RMPs in spring of 1999, a local reporter reviewed some material developed by EPA which appeared to be a "wish list" of how LEPCs could be involved in the RMP program. Although the LEPC did not understand this to be a list of mandated 112(r) duties, the reporter did interpret the guidance in this way. This resulted in negative press coverage about the LEPC's failure to carry out these actions, and was seen as hurting the LEPC's credibility with the public.
5. Hazard reduction more effectively achieved through other programs
Nearly all the LEPCs expressed their belief that the most significant achievements in hazard reduction in their jurisdictions have already occurred due to programs other than RMP, or will continue to be driven by forces other than the LEPC.

    Several LEPCs noted that most hazard reductions in their communities occurred as a result of SARA Title III activities. In particular, it was stated that Tier 2 chemical storage data was being used to accomplish the same objective as RMP, and that most of the information on community chemical hazards had already been provided to the LEPCs through Tier 2 data. This in turn has been seen as driving facility efforts to reduce hazards. As an example, the North Florida Regional Planning Council cited alternative chemical strategies and reduced inventory strategies that had been used by area facilities to reduce their Tier 2 reporting. The York County (PA) LEPC noted that Tier 2 reporting fees have been declining and that this suggested industry efforts to reduce on-site inventories. Similar examples were provide by other LEPCs. An additional driver for hazard reduction that was identified is the OSHA Process Safety Management (PSM) requirement. Many LEPCs noted that the PSM requirement has been effective in hazard reduction by forcing facilities to conduct comprehensive process safety reviews of their processes. Through this requirement, risk reduction and pollution prevention opportunities have been identified for those parts of a facility that posed the greatest risk. Several LEPCs identified initiatives by individual facilities and by the chemical industry at large as more significant in reducing hazards. Many of these initiatives are seen as driven by an effort to reduce operating costs, a desire to reduce liability, and in some cases to improve their public image. One opinion frequently expressed was that facilities that have good safety programs are already working to control and reduce hazards. Companies that follow the American Chemistry Council's Responsible Care Code are already committed to continuous reduction of risk. This commitment is shared by companies that are ISO-14000 certified or that have otherwise adopted an environmental management system. Many LEPCs viewed the facilities within their jurisdictions as safety conscious, and felt existing regulations and practices already required a safety improvement plan. For these LEPCs, the RMP was seen as just another process to go through what the facilities were already doing.

At the same time, several LEPCs noted that the requirement to prepare a Risk Management Plan was in itself a driver for hazard reduction. This was seen as occurring in two ways. First, a number of facilities were reported to have made process changes as a result of preparing the worst-case and alternate-case accident scenarios. For example, the Union County (AR) LEPC reported that a local refining facility switched from hydrogen chloride to liquid chloride in its production process, as an effort to reduce a risk identified during the preparation of its RMP. The Deer Park (TX) LEPC conducted a survey of its RMP facilities immediately following RMP submission and identified numerous hazard reduction efforts made as result of preparing their RMPs. Second, several LEPCs acknowledged that some facilities within their jurisdictions had reduced the amount of chemicals stored on-site in order to get below the threshold for RMP filing. These reductions allowed the facilities to maintain only those quantities of chemicals needed for immediate, short-term use while maintaining continuity of operations with "just in time" shipments. This was generally acknowledged as positive for reducing on-site storage of hazardous materials , although a number of the LEPCs noted that the reduction in on-site storage risk may have been offset by additional transportation hazards resulting from increases in chemical shipments. Finally, it was noted that additional reduction of hazards may be more effectively promoted by emergency management organizations other than the LEPC. For example, LEPCs in Adams County, CO, Clark County, NV and Washtenaw County, MI reported that fire service officials in their jurisdictions regularly visit with hazardous facilities and have better knowledge and training to identify hazard reduction opportunities than the LEPC. Other LEPCs noted that their organization's work is conducted through a county emergency management agency, which already has the responsibility for hazardous materials management as well as the needed expertise and training. Still another LEPC reported that hazard reduction within its jurisdiction was more likely to occur through the work of citizen advisory groups, where plant managers are more likely to attend, than through the LEPC, where primarily emergency responders attend. In all these cases the LEPC was not seen as adding value to the hazard reduction work already being done by others.

6. Higher priority given to other responsibilities
Many of the LEPCs reported that hazard reduction was not seen as a high priority for their organizations. In part this is because LEPCs view emergency response and emergency planning, whatever the cause of the emergency, as their most important jobs and have little time or budget for what they see as peripheral duties. More often, however, LEPCs are more concerned with making sure all industries are meeting SARA Title III reporting and RMP filing responsibilities. Several LEPCs reported that they were having to devote significant time in outreach to industry to ensure compliance with these reporting requirements. Focusing on hazard reduction was seen as secondary to this task.

   Other LEPCs reported that conflicting duties required them to place a lower priority on hazard reduction. For example, LEPCs in some states are constrained because they are run by agencies with both emergency planning and environmental regulatory duties. Other LEPCs that are responsible for all-hazards planning are further constrained from devoting time or resources to hazardous materials risk reduction.

7. Lack of access to RMPs
In order to use RMPs as a tool for promoting hazard reduction, it is necessary to first have access to each facility's plan. However, nearly all of the LEPCs contacted for this study reported that they did not obtain or maintain copies of RMPs in their office. Some LEPCs said they made a conscious decision not to obtain copies of the plans because of the volume of material it would generate, but stated they could obtain the plans from the facilities if needed. Others maintained copies of the RMP executive summaries. In both cases, members of the public requesting RMP information would be directed to a facility contact for further information.

   There appears to be some uncertainty regarding LEPC responsibility for maintaining copies of these plans, and for how they are to be obtained. Some of the LEPCs expressed concern that it appeared EPA expected them to have the plans available, but that there was no mechanism in place for this to occur. This in turn results in confusion among the public about where RMPs may be obtained. For example, one LEPC noted that persons who access the Vulnerability Zone Index on the EPA/CEPPO website and are advised that their zipcode is within one or more vulnerable zones are directed to contact their local LEPC for further information. Without a means to ensure that the LEPC has the information, however, such public inquiries may not be satisfactorily addressed. Another LEPC reported that one of its facilities had a corporate policy stating it was EPA's responsibility rather than the company's responsibility to provide their RMPs to the LEPC.

8. Public apathy
   Nearly all of the LEPCs contacted noted that public apathy toward chemical risks in their communities made it difficult for the LEPC to generate support or demand for hazard reduction. Reasons for this apathy varied widely, but it was generally believed that either the public did not perceive the risk from chemical hazards to be great, or they believed the government was taking care of managing these risks and therefore the public does not need to worry about it. As evidence of this attitude, nearly all of the LEPCs reported little or no public attendance at RMP rollout events and few or no requests for RMP data or any other hazard information.
9. Perceived value of RMPs
   Some of the LEPCs expressed the view that Risk Management Plans have limited value as a tool to encourage hazard reduction. One common concern raised related to the number of chemical risk management plans currently required. It was noted that RMPs are in addition to the required county emergency plans and facility off-site emergency plans. While ideally these plans should be coordinated, doing so was seen as a challenge for many LEPCs. Further, the requirements for these other plans reduces the impact the RMP might have had since it was frequently seen by both LEPCs and industries as "just one more requirement."

   A secondary concern related to the requirement for worst-case accident scenarios. For some LEPCs, these scenarios were viewed as being of some benefit for emergency planners and responders in improving emergency response plans, but of little use to industry and misleading to the general public because they are not likely scenarios. Worst-case scenarios were seen by some as raising unrealistic concerns about potential chemical accidents and thereby increasing the difficulty in communicating with the public about risk.
10. Concern about relationship with industry partners
   LEPCs generally viewed their relationship with regulated facilities as an important factor in determining their organization's success. Most frequently this is because of the support provided by industry for LEPC operations, for training and equipment for responders, and for mutual aid for response to accidents. A few of the LEPCs contacted for this study stated that they did not see a role for themselves in encouraging hazard reduction because it would appear they were taking on a regulatory role and "policing" the industry. While this is certainly not a universally held view, it was deemed noteworthy as a potential obstacle for other LEPCs.
11. Lack of state support
   Many LEPCs viewed their ability to engage in activities encouraging hazard reduction as being limited by the absence of state-level support for such efforts. For example, it was noted that LEPCs follow the direction of their State Emergency Response Commissions and may receive, at most, only partial grant funding to cover training and other responsibilities mandated by EPCRA. There is little or no funding available for functions not mandated by EPCRA, such as hazard reduction. In addition, several LEPCs noted that they participated in RMP in only a limited way because their state had elected not to pursue 112(r) delegation and the SERCs or state emergency management agencies were reluctant to add any RMP duties to the existing LEPC responsibilities.
12. Unwilling partners
   Because LEPCs do not have regulatory power or a statutory mandate to affect hazard reductions, any achievements in this area will require the cooperation and participation of industry or government regulatory authorities. As presented earlier in this report, some success has been achieved in encouraging facilities to reduce hazards. Other LEPCs, however, reported difficulties in affecting such changes. One LEPC reported that it was unsuccessful in persuading a facility to relocate an ammonia storage tank that posed significant potential risk to a nearby commercial airport. Other LEPCs reported their inability to convince their planning and zoning boards to restrict locations of industrial facilities near residential subdivisions, in spite evidence of hazardous materials risk. While the outcome of such situations will be based on a unique set of circumstances, it is noteworthy that in these cases the LEPCs viewed the unwillingness of industry or government authorities to act as a factor limiting the LEPC's ability to encourage hazard reduction.
13. Concern about liability
   As reported earlier by EPA in its justification for public access to offsite consequence analysis data, some LEPCs would rather not take possession of the RMPs, regardless of whether they are entitled or have access, because of the severe potential penalty for improper public disclosure. These perceived negative impacts were seen as having a chilling effect on the desireability and use of OCA data and even other associated RMP information.

Some of the LEPCs contacted for this study noted that recent legislative efforts to limit public access to OCA data raised concerns about their potential liability if they got too involved in using RMP data. There were no specific examples of how such problems might arise; rather, it was a general concern that made these LEPCs reluctant to make much use of RMP information.

14. Most significant hazards not addressed by RMP
    Nearly all of the LEPCs reported that the Risk Management Plan program does not address the risk from transportation of hazardous materials, which is seen by many LEPCs as the most significant hazmat risk faced by their communities. While regulation of hazardous materials at fixed facilities has resulted in significant reductions of risk, the movement of such materials on highways, railroads, barges and pipelines is viewed as a greater threat which is not nearly as tightly controlled and which has no RMP equivalent. As a result, even if LEPCs are willing and able to encourage hazard reduction at RMP facilities, many of them believe that overall risk to the community may not be significantly reduced if transportation concerns are not similarly addressed.

CONCLUSIONS

1. Nearly all LEPCs contacted recognize the value and importance of the Risk Management Plan program.
   There appears to be a good working knowledge of the RMP program among active LEPCs. Risk Management Plans are seen as having several benefits:
   - RMPs have helped shed light on areas where risk could be reduced;
   - For the regulated community, RMPs have heightened their awareness of risk and provided them with an opportunity to talk about chemical threats with the public;
   - Developing RMPs has caused facilities to face risk and make changes in facility operations to reduce risk, especially for municipal authorities;
   - Many companies have been continually looking at risk reduction and reviewing safety processes, but the RMP has forced more attention to this due to public disclosure. RMPs have forced other facilities to look at the community impact of their operations and "talk to the neighbors;"
   - RMPs have provided an opportunity for LEPCs to increase dialogue with the public;
   - RMPs have also provided an opportunity for LEPCs to work more closely with industry, whom LEPCs see as an important partner in emergency management; and
   - RMPs have provided additional information to both LEPCs and industry to improve existing emergency planning and response.
2. Many LEPCs see a potential role for their organizations in encouraging hazard reduction using RMP or similar information.
   LEPCs recognize that although encouraging hazard reduction is not a statutory mandate, it is a fundamental goal of EPCRA and of risk management generally. They also recognize that their organizations have the structure and the access to much of the risk information needed to carry out this function. The most likely opportunities for LEPCs to encourage hazard reduction are:
   - Identifying the greatest risks in the community;
   - Reviewing accidents for lessons learned;
   - Providing a forum for dialogue with and among facilities; and
   - Providing information to the public to increase pressure on facilities for further hazard reductions.
3. With a few exceptions, LEPCs do not believe they are positioned to effectively encourage facilities to reduce chemical hazards.
   While LEPCs see a potential role in encouraging hazard reduction, most believe there are significant obstacles that limit their effectiveness. LEPCs see themselves as loose coalitions of organizations and individuals working on a voluntary basis. Most do not have the time, resources or expertise to encourage hazard reduction. Most also see that significant reductions in hazards at facilities are more effectively achieved through other programs or actions of others which are outside the influence of the LEPC. Other legal and institutional barriers are seen as limiting accomplishment in this area.
4. LEPCs see their role in hazard reduction as resulting more from carrying out their EPCRA responsibilities than from RMP.
   Most LEPCs have focused on the emergency planning and training aspects of their jobs, and have not made a concerted effort to encourage facilities to reduce hazards at their sites. However, many also see that carrying out these EPCRA-mandated responsibilities indirectly contributes to hazard reduction by insuring that off-site consequences of accidental chemical releases are minimized by coordinated planning and well-trained and equipped emergency response personnel. Moreover, LEPCs view their role in providing risk information to the public as a major driver of hazard reduction at facilities.
5. Since initial submission of RMPs in June, 1999, most LEPCs have not continued to be actively involved in the RMP program.
   LEPCs contacted in this study reported that they have had minimal involvement in implementing the RMP program since the initial plan submission. While some LEPCs have used the RMP information to review their emergency response plans, and in a few cases have worked with facilities to encourage further hazard reduction, most have not seen RMP as a significant new tool to guide their work.

6. Any expansion of LEPC involvement in the RMP program, particularly in hazard reduction, will require that EPA address the factors affecting LEPC involvement addressed in this report.
   If congressional and agency intent for SARA Title III and CAA Section 112(r) is for LEPCs to encourage hazard reduction, a reconfiguration of LEPC responsibilities and evaluation of the factors affecting their involvement is in order. While the obstacles listed in the report are based on discussions with the 32 LEPCs examined for this study, it is reasonable to assume they also represent concerns of the broader LEPC community. These organizations look to EPA and the SERCs for leadership, and believe that further involvement in encouraging hazard reduction will require that these obstacles be addressed.

SECTION 4: RECOMMENDATIONS

Based on the findings of this study, the National Institute for Chemical Studies believes there are significant opportunities to strengthen the role of Local Emergency Planning Committees in reducing chemical hazards. Information gained from the LEPCs examined for this report suggests there is interest and desire to work toward this goal, but that challenges exist which need to be addressed if this is to occur. Because of its leadership role in chemical emergency prevention and preparedness, EPA is encouraged to examine how these challenges might best be met, in order to more fully achieve the intent of both EPCRA and CAA Section 112(r). The following recommendations are offered for consideration by EPA/CEPPO:

1. EPA should publicize the best practices of LEPCS in hazard reduction that are highlighted in this report.
   An initial objective of this study was to identify examples of LEPCs that have utilized RMP or other chemical risk information to encourage risk reduction at facilities within their jurisdictions. Because of the factors noted in Section 3, many LEPCs have not pursued this opportunity. However, the descriptions of actions that have been taken may offer ideas that could be adapted or modified by other LEPCs. Several LEPCs contacted for this study expressed an interest in learning how others are approaching hazard reduction.
   We recommend that EPA/CEPPO make this report available to all LEPCs and SERCs through its website and electronic newsletter, and provide opportunities to share the information through national, regional and state meetings of emergency managers and other interested groups. We also encourage EPA to solicit feedback and other examples of LEPC activity to add to the knowledge gained during this study.
2. EPA should clarify its expectations of the role of LEPCs in implementation of the Risk Management Plan program, and in hazard reduction generally, and develop guidance for LEPCs and SERCs.
   During the course of this study, many LEPCs expressed uncertainty about their expected role in RMP implementation generally and hazard reduction specifically. Basic RMP guidance for LEPCs has been previously developed by EPA, some of which was reviewed during this study. There is less guidance available to suggest what is expected for LEPCs in encouraging hazard reduction. Given the complexity of the RMP program, the connection between RMP and other risk management programs, and the existing responsibilities of LEPCs, further clarification of the LEPC role is needed. Additional guidance would serve two purposes: (1) it would help LEPCs more effectively comply with their EPCRA responsibilities; and (2) it would make better use of this national network of emergency planning organizations in meeting the fundamental goal of Section 112(r).
   We recommend that EPA develop additional guidance on the benefits and potential uses of RMP data for hazard reduction, specifically as it relates to the LEPC responsibilities under EPCRA. This guidance should be developed in consultation with LEPCs, SERCs, and other appropriate stakeholders.
3. EPA should re-examine and re-evaluate the support structure for LEPCs and its priority within EPA/CEPPO.
   The purpose of this study was to examine how LEPCs are using the RMP to encourage hazard reduction. During our discussions with the LEPCs contacted for the study, it was evident that their role in RMP is part of the larger issue of the purpose and intent of local emergency planning committees under EPCRA. Much of the involvement, or lack of involvement, of LEPCs in RMP and hazard reduction appears to relate back to basic questions of what LEPCs are required to do and how they are supported to carry out these duties. These organizations have made significant achievements given limited financial resources and almost entirely volunteer support. At the same time, such resource constraints will continue to limit the effectiveness of LEPCs in meeting the intent of both Section 112(r) and EPCRA.
   We recommend that EPA re-examine and re-evaluate the role of LEPCs in implementing national chemical risk management priorities and the existing support systems for LEPCs, and work to ensure support at a level appropriate to their intended role.
4. EPA should seek to improve its understanding of the characteristics of active LEPCs, and use this information to focus its efforts on LEPCs that are not currently active.
   Throughout this study we talked with several LEPCs who are actively working to meet or exceed their responsibilities under EPCRA. While each has its own unique characteristics and issues, there appeared to be certain factors common to those organizations that have succeeded in spite of the constraints faced by most all LEPCs. Some of these factors include a well-defined organizational planning process, a committee structure

for conducting LEPC business, and a strong LEPC-industry partnership. There are undoubtedly many other factors that contribute to LEPC success. Recent national surveys have shown that while some LEPCs are considered active, many more see themselves as inactive or struggling to meet the basic requirements of EPCRA. Assuming that LEPCs will continue to play an important role in implementing national chemical risk management programs, it would be desirable to identify factors that determine LEPC success and use that information to strengthen LEPCs nationwide.

We recommend that EPA undertake a study of the characteristics of active LEPCs, and apply the knowledge gained from that study to improve support of LEPCs through CEPPO, the EPA regional CEPP programs, and through the SERCs.

Appendix A: Resources Reviewed

Adams, Mary Pat. LEPCs in Colorado: How Does Public Participation Fit Their Mission? Paper submitted to University of Colorado at Denver, Graduate School of Public Affairs, May, 1998.

Chemical Education Foundation. LEPCs, SERCs, and CAPs Help Protect Your Community's Environment, Health, and Safety. Product Stewardship Bulletin No. 15 (no date).

Colorado SERC. Colorado Local Emergency Planning Committee Handbook. (no date).

Community Members' Role in EPCRA. Discussion paper at www.chemicalspill.org (no date).

National Institute for Chemical Studies. Focus on the Future of LEPCs. Charleston, WV: 1995.

Nationwide LEPC Survey. William C. Adams, Stephen D. Burns, and Phillip G. Handwerk, Department of Public Administration, The George Washington University. October, 1994.

Ohio SERC. Local Emergency Planning Committee Member's Handbook. Revised August, 1998.

Region 6 Local Emergency Planning Committee (LEPC) Handbook. Steve Mason and Keith Reddick, USEPA Region 6. April, 2000.

The Role of Local Emergency Planning Committees (LEPCs) and Other Local Agencies in The Risk Management Program (RMP) of Clean Air Act (CAA) Section 112(r) – Subgroup #7 Report. Report to USEPA's RMP Implementation Workgroup. March, 1998.

USEPA/Chemical Emergency Preparedness and Prevention Office. Assessment of the Incentives Created by Public Disclosure of Off-Site Consequence Analysis Information For Reduction in the Risk of Accidental Release s. Washington, D.C.: April, 2000.

USEPA, Chemical Emergency Preparedness and Prevention Office. RMPs Are On The Way! How LEPCs and Other Local Agencies Can Include Information from Risk Management Plans in Their Ongoing Work. Washington, D.C., November, 1999.

U.S. Public Interest Research Group. Too Close to Home: A Report on Chemical Accident Risks in the United States. Washington, D.C.: July, 1998.

Walter, R.J. Local Emergency Planning Committee Guidebook: Understanding the EPA Risk Management Planning Program Rule. Center for Chemical Process Safety, American Institute of Chemical Engineers, New York, 1998.

Appendix C: Examples of LEPC Activity

LEPC FOCUS: Centre County, Pennsylvania

Although Centre County is located in rural Pennsylvania, the LEPC has its share of hazmat risks from propane suppliers, chemical manufacturers, and water and wastewater treatment facilities. Also, like many agricultural areas Centre County must deal with chemical hazards at farming operations. The LEPC regularly uses Tier 2 reports to review community risk and focus its emergency planning efforts. Two programs have been initiated to collect information from farms and gas stations, which otherwise are not required to report. Gas stations are asked to fill out an information form showing the amount of gasoline stored on-site; this data is used to support emergency planning and response. Farmers are asked to provide a list of their chemicals stored on-site, in exchange for a highway-quality sign with the warning "Danger – Chemical Storage." The LEPC reports good cooperation with the Farm Sign Program because the participants see it as a way of protecting their neighbors.

LEPC FOCUS: Cuyahoga County, Ohio

Cuyahoga County LEPC covers 59 political subdivisions including the City of Cleveland, and includes over 260 SARA Title III facilities. The LEPC has sought to encourage hazard reduction by annually surveying facilities to determine what EHS reductions they have achieved, and providing public recognition of these companies through an environmental awards program. The LEPC has also sponsored a seminar for industry on hazard reduction, in conjunction with a local organization Environmental Health Watch. A technical consultant is also retained by the LEPC to assist RMP facilities update their alternative case accident scenarios.

LEPC FOCUS: Philadelphia, Pennsylvania

The City of Philadelphia's LEPC has actively worked for several years to identify hazmat risks and coordinate emergency response plans in this major metropolitan area. Hazard reduction has been encouraged through dialogue with the community and with industry. The LEPC regularly participates in community environmental fairs, which were used to promote the RMP and focus on environmental improvements. A facility committee within the LEPC was also established to enable roundtable discussions of safety issues among member facilities. Following a 1997 release at a local refinery, the City asked the LEPC to bring the refinery in to discuss what could be done to prevent future occurrences. As a result, additional safety measures were identified, and a Community Advisory Committee was established for ongoing dialogue with the refinery.

LEPC FOCUS: Fayette County, Georgia

The Fayette County LEPC, the oldest LEPC in the state, is located 25 miles south of Atlanta in a low population density area with predominately high tech industries. A 1995 hazard analysis showed the greatest chemical hazard is chlorine used for treatment in local water treatment plants and local industrial facilities. The LEPC worked with local chlorine users to review RMP requirements and prepare for plan submission. Working in close partnership with the State of Georgia and industry, the LEPC worked to ensure that safety plans were developed for each of the chlorine-using facilities. These efforts resulted in several facilities reducing or eliminating chlorine treatment. A plant-specific chlorine safety training program by the Georgia Institute of Technology was also developed with EPA funding.

LEPC FOCUS: Washtenaw County, Michigan

This LEPC is located in Ann Arbor, Michigan and includes approximately 65 SARA Title III facilities, primarily wastewater treatment plants and facilities related to the automobile industry. Since the passage of EPCRA the LEPC has worked in conjunction with county officials to conduct regular inspections of all SARA facilities. Currently these inspections are conducted with the county Environmental Services Division and provide an opportunity to both review emergency planning information and discuss pollution prevention opportunities. The inspections include a review any chemicals stored in quantities of 5 gallons or more, not just EHS chemicals. As a result of a recent inspection of a manufacturing facility, it was determined that the facility could significantly reduce risk from storage of TDI (toluene diisocynate) by switching from bulk rail storage to just-in-time delivery, without interrupting the production process.

LEPC FOCUS: Johnson County, Kansas

Although Johnson County, which is part of the Kansas City metropolitan area, is not a major chemical producing area, its LEPC has developed a proactive approach toward improving safety by focusing on hazard reduction at wastewater treatment plants and other facilities. Working with the LEPC, six area wastewater treatment plants found they could easily switch from chlorine treatment to ultraviolet treatment, thus eliminating a potential major hazard. An LEPC site visit to a printing company led to elimination of an ammonia storage tank in favor of more frequent but smaller shipments. Although the facility initially saw this as a costlier alternative, the reduction in risk of off-site consequences was viewed as providing sufficient savings on insurance costs to justify the change.

LEPC FOCUS: Springfield, Massachusetts

The Springfield LEPC, which includes over 200 SARA Title III reporting facilities seeks to promote hazard reduction as part of its EPCRA responsibilities through facility inspections and training. The LEPC participates on a team that conducts regular inspections of all SARA facilities, with a focus on opportunities for risk reduction. The team includes police, fire, health department and LEPC representation. The inspections have received favorably by the facilities because it is seen as bringing outside perspectives to identify areas for improvement without the threat of regulatory action. The LEPC also conducts a general chemical safety course, with a focus on toxic use reduction, for local industries and emergency responders, and has worked with local schools to identify and dispose of unneeded chemicals.

LEPC FOCUS: Deer Park, Texas

The Deer Park LEPC is located in southeast Texas in one of the most active chemical manufacturing and refining areas in the United States, and has a strong history of leadership and activity in community safety. The LEPC works in partnership with the East Harris County Manufacturers Association (ECHMA) and the Association's Community Advisory Councils. Together these three groups saw the RMP program as an opportunity for risk reduction. The LEPC actively participated in the ECHMA rollout of the RMPs, and maintains copies of the plans at its office, categorized by flammables and toxics. A survey was conducted two weeks after the public RMP rollout, asking the facilities to identify changes they made to reduce risk as a result of the RMP hazards analysis. The LEPC also used the plan information to rank community hazards by end-point distance, and intends to use the analysis to identify opportunities for further risk reduction. Facilities are also asked to regularly report to the Community Advisory Councils on progress made to reduce the hazards and vulnerable zones identified in their plans, and a public report is prepared.

ANHYDROUS AMMONIA THEFT

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Who should read this Alert? This Alert discusses the potential hazards of anhydrous ammonia releases caused by theft, steps facilities can take to prevent theft and how to minimize health and safety risks associated with accidental releases. This Alert should be read by individuals who operate and maintain agricultural retail operations, facilities with ammonia refrigeration systems and farmers who apply anhydrous ammonia as a fertilizer. Furthermore, this Alert should be reviewed by law enforcement personnel, emergency responders and members of Local Emergency Planning Committees (LEPCs).

PROBLEM

Anhydrous ammonia is used as an agricultural fertilizer and industrial refrigerant. The substance is stored and used at agricultural retailers and facilities with ammonia refrigeration systems. Anhydrous ammonia also is a key ingredient in the illegal production of methamphetamines. Illegal drug makers often steal anhydrous ammonia from areas where it is stored and used. Anhydrous ammonia is stored as a liquid under pressure, however, it becomes a toxic gas when released to the environment. Anhydrous ammonia can be harmful to individuals who come into contact with it or inhale airborne concentrations of the gas. When stolen, the toxic gas can be unintentionally released, causing injuries to emergency responders, law enforcement personnel, the public, and the criminals themselves.

ACCIDENTS

A number of anhydrous ammonia thefts have resulted in accidental chemical releases from agricultural retailers and facilities with ammonia refrigeration systems. The accidents have occurred when valves were left open as anhydrous ammonia was siphoned off; locks were sawed or broken; anhydrous ammonia was transferred inappropriately into makeshift containers such as propane tanks used on barbeque grills; plugs were removed from anhydrous ammonia lines at refrigeration facilities; or the wrong hoses and/or fittings were attached to storage containers, causing leaks and spills that would otherwise not have occurred.

The following section describes several recent examples in more detail.

- April 1997 - More than 2,000 pounds of anhydrous ammonia were released from a refrigerated warehouse. A fence was cut to gain entry into the facility and the anhydrous ammonia was removed through a valve on an oil separator. The valve was left open. Fortunately, the release was mitigated by a rain storm that knocked down the anhydrous ammonia vapor as it was being released to the outside air. The warehouse owner replaced the fence, installed a valve lock on the oil separator valve, and requested enhanced police surveillance following the incident.

- April 1998 - An individual attempted to steal anhydrous ammonia from a nurse tank at a retail agricultural dealer in Iowa. The liquid withdrawal valve was left open on the nurse tank and caused an ammonia release that quickly vaporized to the air. One passerby was overcome by the anhydrous ammonia fumes and collapsed. Another nearby resident was overcome by ammonia fumes after leaving her home. Both individuals were hospitalized. Several other area residents were evacuated as a precaution. The agricultural dealer installed security lights following the incident.

- April 1999 - A hose on a 30,000-gallon bulk storage tank of anhydrous ammonia was cut intentionally by thieves which resulted in an accidental release at an Illinois fertilizer dealer. One police officer was hospitalized and a highway was shut down for a half hour.

- May 1999 - One person was killed when a makeshift container of anhydrous ammonia he was holding exploded. The death occurred when two individuals were driving on an interstate highway in Missouri. The driver was severely injured. The ammonia was to be used for methamphetamine production. Since the cause of the smoke emanating from the car was not immediately known, one fire-fighter, one emergency medical technician, and one member of the general public, all of whom stopped to help and drag the passenger and driver from the car, were also injured as a result of the ammonia release.

- February 2000 - Approximately 1000 pounds of anhydrous ammonia were released when someone intentionally opened a valve in the middle of the night at a fertilizer dealer in Missouri. The ammonia release caused 300 residents to be evacuated from their homes and two persons reported respiratory irritation problems. Ammonia theft has been almost a weekly occurrence at this facility. A local law enforcement investigation is currently underway.

HAZARD AWARENESS

Anhydrous ammonia is used widely and in large quantities for a variety of purposes. More than 80% of the ammonia produced in the United States is used for agricultural purposes; less than 2% is used for refrigeration. Ammonia is generally safe provided handling, operating, and maintenance procedures are followed. Anhydrous ammonia is toxic, however, and can be a health hazard. Effects of inhalation of anhydrous ammonia range from lung irritation to severe respiratory injuries, with possible fatality at higher concentrations. Anhydrous ammonia also is corrosive and can burn the skin and eyes. Liquefied anhydrous ammonia is stored as a liquid and has a boiling point of minus 28 degrees Fahrenheit. At this temperature it can cause freezing burns.

When stored for agricultural purposes and for use in refrigeration systems, anhydrous ammonia is liquefied under pressure. Liquid anhydrous ammonia expands 850 times when released to ambient air and can form large vapor clouds. Also, liquid anhydrous ammonia, if accidentally released, may aerosolize (i.e., small liquid droplets may be released along with ammonia gas) and behave as a dense gas, even though it is normally lighter than air.

Anhydrous ammonia may also cause water vapor to condense in the air forming a visible white cloud. Therefore, when anhydrous ammonia is released to the air, it may travel along the ground in a cloud instead of immediately rising into the air and dispersing. This dense gas behavior may increase the potential for exposure of workers and the public.

Anhydrous ammonia containers have particular specifications as required by the Department of Transportation (DOT). Storage tank specifications for anhydrous ammonia ensure that it is stored properly as a pressurized liquid and a corrosive chemical. For example, some storage containers for anhydrous ammonia must have rated pressure relief devices to reduce the likelihood of over pressurization of the container. Because anhydrous ammonia is corrosive, specific valves and hoses that do not readily corrode have to be used.

Pure anhydrous ammonia vapors can become an explosion hazard when in a confined space at concentrations between 16 and 25 % by volume. Mixtures involving anhydrous ammonia contaminated with lubricating oil (e.g. in a refrigeration system), however, may lower the explosive range.

Anhydrous ammonia can be recognized by its pungent odor. Odor threshold varies with the individual but ammonia can usually be detected at concentrations above 5 ppm. Concentrations above 100 ppm are uncomfortable to most people; concentrations in the range of 300 to 500 ppm will cause people to leave the area and are immediately dangerous to life and health.

CLANDESTINE USE

Anhydrous ammonia can be as inexpensive as $200 a ton for agricultural purposes, but can sell for as much as $300 per gallon on the black market when obtained illegally. Very small amounts of anhydrous ammonia are needed to make a batch of methamphetamine. In fact, enough "residual" ammonia is left in a typical transfer hose for a criminal to use for methamphetamine production.

Anhydrous ammonia theft appears to occur in waves with thieves stealing the chemical multiple times at one location. Criminals prefer to use anhydrous ammonia to manufacture methamphetamine because many of the other ingredients needed to make the drug are available commercially. Additionally, the fact that anhydrous ammonia speeds up the manufacturing process to just a few hours makes it attractive to drug makers.

Attempted thefts have occurred at such unlikely places as refrigeration systems holding ammonia, underground pipelines carrying ammonia, and rail cars transporting anhydrous ammonia. Often thefts are aborted when thieves are injured or overcome by the toxic gas. During these aborted attempts, "tools" are often left behind, such as duct tape, inner tubes, buckets, coolers, and/or propane barbeque bottles. Several states have passed legislation making it a felony to tamper with or steal anhydrous ammonia, or hold the substance in a non-approved container.

Special note to first responders: Anhydrous ammonia can be found in the DOT Emergency Response Guidebook under Number
125. The UN Number for anhydrous ammonia is 1005 and is placarded Class 2.2, Nonflammable gas.

Anhydrous ammonia corrodes brass valving turning the brass to a blue/green color. When inside inappropriate pressure cylinders (e.g. propane cylinders), anhydrous ammonia attacks brass valving from the inside out. In this situation, it is difficult to assess the integrity of valving from outside physical appearances. Extreme caution should be used when handling inappropriate containers storing anhydrous ammonia. Brass valving that appeared to be physically intact from outside appearance has been known to break off in the hands of responders creating an uncontrolled release from the container. Also, these containers should not be transported in the trunks of cars or other vehicles where the container and the occupant are in the same compartment.

Furthermore, responders should take care in selecting the proper personal protective equipment (PPE) level. Due to anhydrous ammonia's low boiling point, affinity for water, and inhalation hazard, responders can be injured if not wearing proper PPE. Structural fire fighter protective clothing may not provide adequate protection during an anhydrous ammonia release. The use of self-contained positive-pressure breathing apparatus is appropriate during a response to an anhydrous ammonia release. In addition to other appropriate PPE, in some cases it may be necessary to wear cryogenic gloves with a moisture barrier to protect against freezing and/or chemical burns.

HAZARD REDUCTION AND PREVENTION

Here are some tips to deter anhydrous ammonia theft:

- Educate your employees about the theft problem.
- Store tanks in well-lit areas.
- Know your inventory to quickly identify missing chemicals.
- Visually inspect tanks each morning, especially following weekends or other periods where the facility is not occupied.
- Consider auditing your facility and setting up a valve protection plan for critical valves that could cause significant releases if left open.
- Consider installing valve locks or fencing, especially for unattended tanks.*
- Report thefts, signs of tampering, leaks, or any unusual activity to local law enforcement officials.
- Consider installing other theft deterrent measures such as motion detector lights, motion detector alarms, security patrols, and/or video surveillance.

** The ANSI Standard K61.1 states under section 6.7 "Protection of Container and Appurtenances" that "main container shut-off valves shall be kept closed and locked when the installation is unattended." Furthermore, it states that "if the facility is protected against tampering by fencing, or other suitable means, valve locks are not required." Many states have adopted the ANSI Standard K61.1 as law; please check your state regulations or contact your state agricultural department or fire marshal for details. Also, OSHA's requirement for storage and handling of anhydrous ammonia under §1910.111(c)(6) state that "valves, regulating, gaging, and other appurtenances shall be protected against tampering and physical damage."*

In addition to the general tips above, agricultural dealers or retailers should consider removing hoses during the off-season and storing them separately from tanks. Also, farmers may consider removing nurse tanks from fields when they are no longer needed and returning used tanks, applicators, or toolbars promptly to the dealer after use. Finally, refrigeration facilities may want to evaluate the benefits of installing lockable, quarter-turn, spring-loaded, ball valves in series with a manual valve in critical areas such as at the system fill point or oil discharge pot.

Special note on purchases: Agricultural retail establishments should be aware that they may be approached by individuals wanting to purchase ammonia for use in the illegal production of methamphetamine. The following list was developed by the Drug Enforcement Administration (DEA) to help you identify individuals who may be seeking to purchase anhydrous ammonia for illegal purposes:

- Customer cannot answer or is evasive about agricultural use questions.
- Customer insists on taking possession rather than having it delivered.
- Customer insists on using cash, money order or cashiers check.
- Customer is a stranger and unfamiliar to area or your business.
- Customer provides suspicious business or credit information.
- Customer is vague or resists providing personal information.
- Customer intends to fill their own inappropriate tank (e.g. a 20-pound propane cylinder). Note: It is unlawful in some states to sell anhydrous ammonia unless it is in an approved product container.

If a customer fits any of these criteria, wait until the person has left your business, write down an accurate description of the person(s), vehicle, license number and contact the DEA or local law enforcement authorities immediately.

INFORMATION RESOURCES

EPA has prepared a general advisory on ammonia and a safety alert on the "Hazards of Ammonia Releases at Ammonia Refrigeration Facilities." Both are available at: www.epa.gov/ceppo

The Agricultural Retailers Association (ARA) and The Fertilizer Institute (TFI) have a brochure "Deter Theft of Anhydrous Ammonia." www.tfi.org or (202) 675-8250; www.ara1.org or (202) 457-0825

The Agribusiness Association of Iowa has prepared a fact sheet "Anhydrous Ammonia Theft, What You Need To Know," available at:
www.exnet.iastate.edu/publications/pg99015.pdf

The Hazardous Materials Emergency Preparedness Grant Program has a publication available "Guidelines for Public Sector Hazardous Materials Training" - See Section 2, Special Topics - Illicit Use of Hazardous Materials: First Responder Training Issues. www.fema.gov/emi/hmep

STATUTES AND REGULATIONS

The following is a list of federal statutes and regulations related to process safety, accident prevention, emergency planning, and release reporting.

EPA

Clean Air Act (CAA)

- General Duty Clause [Section 112(r)(1) of the Act] - Facilities handling extremely hazardous chemicals (including anhydrous ammonia) have a general duty to assess hazards, design and maintain a safe facility, and minimize the consequences of accidental releases.
- Risk Management Program (RMP) Rule [40 CFR 68] - Facilities that have anhydrous ammonia in quantities greater than 10,000 pounds are required to develop a hazard assessment, a prevention program, an emergency response program, and submit a risk management plan to EPA.

Emergency Planning and Community Right-To-Know Act (EPCRA)

- Emergency Planning [40 CFR Part 355] - Facilities that have 500 pounds or more of ammonia must report to their LEPC and SERC and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355] - Facilities that release 100 pounds or more of ammonia (other than the normal application of a fertilizer) must immediately report the release to the LEPC and to the SERC.
- Hazardous Chemical Reporting [40 CFR Part 370] - Facilities that have ammonia at or above 500 pounds must submit an MSDS to their LEPC, SERC, and local fire department and comply with the Tier I/Tier II inventory reporting requirements.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- Hazardous Substance Release Reporting [40 CFR 302] - Facilities that release 100 pounds or more of ammonia (other than the normal application of a fertilizer) must immediately report the release to the National Response Center (NRC), (800) 424-8802.

DOT

- The Department of Transportation (DOT) [49 CFR 100-180] - Research and Special Projects Administration has requirements covering the transportation of anhydrous ammonia containers.

OSHA

- Process Safety Management (PSM) Standard [29 CFR 1910.119] Anhydrous ammonia is listed as a highly hazardous substance. Facilities that have ammonia in quantities at or above the threshold quantity of 10,000 pounds are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment. The PSM requirements do not apply to retail facilities per 1910.119(a)(2).
- Hazard Communication [29 CFR 1920.120] - Requires that the potential hazards of toxic and hazardous chemicals be evaluated and that employers transmit this information to their employees.
- Storage and Handling of Anhydrous Ammonia [29 CFR 1910.111] – Requires standards for design, construction, location, installation, and operation of anhydrous ammonia systems.

CODES AND STANDARDS

There are a number of state codes and industry standards that apply to safe handling, use, and storage of anhydrous ammonia. A few examples are given below.

American National Standards Institutes (ANSI)
K61.1, 1999 - Standards for the Storage and Handling of Anhydrous Ammonia
Available from ANSI
11 West 42nd Street
New York, NY 10036
(212) 642-4900
Web site: www.ansi.org

ANSI/IIAR 2-1992 - Equipment, Design, and Installation of Ammonia Mechanical Refrigeration Systems
Available from International Institute of Ammonia Refrigeration (IIAR)
1200 19th Street, NW
Suite 300
Washington, DC 22036-2422
(202) 857-1110

CATASTROPHIC FAILURE OF STORAGE TANKS

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. Under CERCLA, section 104(e) and Clean Air Act (CAA), EPA has authority to conduct chemical accident investigations. Additionally, in January 1995, the Administration asked the Occupational Safety and Health Administration (OSHA) and EPA to jointly undertake investigations to determine the root cause(s) of chemical accidents and to issue public reports containing recommendations to prevent similar accidents. EPA has created a chemical accident investigation team to work jointly with OSHA in these efforts. Prior to the release of a full report, EPA intends to publish Alerts as promptly as possible to increase awareness of possible hazards. Alerts may also be issued when EPA becomes aware of a significant hazard. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Catastrophic failures of aboveground, atmospheric storage tanks can occur when flammable vapors in the tank explode and break either the shell-to-bottom or side seam. These failures have caused the tanks to rip open and, in some cases, hurled the tanks through the air. A properly designed and maintained storage tank will break along the shell-to- top seam. Then, the fire would more likely be limited to the damaged tank and the contents would not be spilled. This alert describes the types of tanks that may be prone to catastrophic failure and maintenance practices that can help prevent the accidents.

RECENT ACCIDENTS

Several accidents have occurred within the last few years in which storage tanks have failed catastrophically when the flammable vapors inside an atmospheric tank exploded. The tank was either propelled upward from its base (shell-to-bottom seam failed) or split along the side seam. As a result, workers were killed or injured and the contents were released into the environment.

Three specific incidents demonstrate the potential dangers posed to workers, the public, and the environment when these storage tanks fail catastrophically. In these incidents, the shell-to-bottom seam failed after an explosion and the tank was propelled upward. All occurred in older, atmospheric steel storage tanks. Often workers were performing tank maintenance or other activities that introduced an ignition source. The vapors were ignited either inside the tank or outside and then flashed back into the tank.

In a 1995 incident, during a welding operation on the outside of a tank, the combustible vapor inside two large, 30-ft. diameter by 30-ft. high, storage tanks exploded and propelled the tanks upward — one landing more than 50 feet away. The flammable liquid inside was instantly released and ignited, resulting in a massive fire that caused five deaths and serious injuries.

In a 1992 incident, while workers were welding the outside of a tank empty of liquid, the residual vapor in the storage tank exploded and propelled the tank upward and into an adjacent river. Three workers were killed and one was injured.

In a 1994 incident, during a grinding operation on a tank holding petroleum-based sludge, the tank was propelled upward, injuring 17 workers and spilling its contents over a containment berm into a nearby river.

HAZARD AWARENESS

Tank design and inspection/maintenance practices are factors directly related to catastrophic tank failure.

Tank design

Historically, accidents where the shell-to-bottom seam fails are more common among older storage tanks. Steel storage tanks built before 1950 generally do not conform to current industry standards for explosion and fire venting. Atmospheric tanks used for storage of flammable and combustible liquids should be designed to fail along the shell-to-roof seam when an explosion occurs in the tank. This prevents the tank from propelling upward or splitting along the side. Several organizations have developed standards and specifications for storage tank design. Published standards relevant to this design feature include API-650,"Welded Steel Tanks for Oil Storage" issued by the American Petroleum Institute (API). Additional codes and standards, published by API and other organizations, address tank design, construction, venting, and safe welding and are listed at the end of this alert.

Poor inspection, maintenance, and repair practices

Tanks that are poorly maintained, rarely inspected, or repaired without attention to design, risk catastrophic failure in the event of a vapor explosion. Either weakening of the shell-to-bottom seam through corrosion or strengthening the shell-to-roof seam relative to the shell-to-bottom seam will increase the vulnerability of the tank to failure along the shell-to-bottom seam. The practice of placing gravel and spill absorbants around the base of the tank, may increase the likelihood of bottom corrosion. Given years of this practice, the bottom of some tanks, especially older ones, may be below ground level, thereby trapping moisture along the tank bottom. This can weaken the bottom and the shell-to-bottom seam. Alternatively, changes to the roof seam such as modifications to or replacement of the roof, or attachments to the roof, could make the roof-to-shell seam stronger relative to the shell-to- bottom seam.

Other hazards that can contribute to a tank explosion and possible consequences are:

Combustible vapors

Generation of combustible vapors is a hazard not only for the storage of pure flammable liquids but also for the storage of any sludge or mixture where a combustible component is present or can be produced by reaction. Sludge (slop tanks) and mixture (e.g., oil/water) tanks may be particularly vulnerable because they are sometimes open to the air; explosive atmospheres may form inside and outside the tank. Facilities may not always recognize this hazard. In addition, even tanks appearing to be empty may pose a hazard if they still contain combustible vapors.

In the cited cases, the potential for combustible vapors was not clearly recognized and materials were stored in tanks that were not equipped with flame arresters to prevent external fire from reaching the vapor space inside the tank or with vapor control devices to limit vapor emissions from the tank.

Ignition sources

When combustible vapors escape from their containment and mix with air in the presence of an ignition source, combustion may occur. To minimize this hazard, all possible ignition sources must be isolated from potential combustible vapors, e.g., welding equipment or other maintenance equipment that can spark or arc, sources of static electricity, lightning, "hot work" in adjacent areas, and any electrical equipment in the vicinity of tanks that does not conform to National Fire Protection Association
(NFPA)-70, “National Electric Code.”

Proximity to workers and environment

The danger posed by these tanks is often increased when the location of the tank does not conform with current minimum spacing requirements. Sections 2-3.2 to 2-3.3 of NFPA-30 discuss minimum spacing. For mitigating consequences to workers, the environment, and other tanks, proper secondary containment (diking) should be considered for containment.

HAZARD IDENTIFICATION

Facilities should evaluate their storage tanks for potential to catastrophically fail and identify factors that could cause storage tank explosion. Some of the factors to look for include, but are not limited to, the following:

- Atmospheric storage tanks that do not meet API-650 or other applicable code(s) and contain flammable liquids or liquids that may produce combustible vapor.
- Tanks with corrosion around the base and/or steel tanks whose base is in direct contact with ground and exposed to moisture.
- Tanks or associated structures (e.g., pipes) with weakened or defective welds.
- Tanks used to store mixtures containing water and flammables where the water phase is at the tank bottom and may contribute to internal bottom corrosion.
- Tanks containing combustible vapor and not equipped with flame arrestors or vapor control devices to limit emissions.
- Possible ignition sources near tanks containing combustible vapor.

PROCESS SAFETY AREAS FOR HAZARD REDUCTION

Storage tanks should comply with all regulations, industry codes and standards, including inspection and maintenance requirements to keep tanks in proper condition. Facilities with storage tanks that can contain flammable vapors should review their equipment and operations. Areas to review should include, but not be limited to, the following:

1) Design of atmospheric storage tanks

API and other organizations have standards and codes that address recommended practices for tank design and construction. It is imperative to evaluate whether the liquids or certain components of liquid mixtures may generate combustible vapors. Design measures include fire protection, flame arrestors, emergency venting (such as part of the API-650), prevention of flash back (for tanks containing flammable liquids), and proper berming or diking.

2) Inspection and maintenance of storage tanks

API-653 has tank inspection guidelines and procedures for periodic inspections and testing, especially for older tanks. These procedures call for written documentation of inspections by API Certified Tank Inspectors. Measures to review include procedures for pressure testing, welding inspections, and checks for corrosion or metal fatigue. API-650 specifies welding procedures and welding qualifications as well as joint inspection (e.g., radiograph and magnetic particle examination). Programs for tank inspection and maintenance should be developed in accordance with these standards.

3) Hot-work safety

Both the Occupational Safety and Health Administration's (OSHA) regulations concerning should be reviewed for compliance. Hazard reduction measures include proper hot-work procedures such as obtaining a hot work permit, having a fire watch and fire extinguishing equipment present, and proper testing of atmosphere for explosivity; covering and sealing all drains, vents, manways, and open flanges; sealing all sewers (to prevent gas or vapor migration); and training workers and providing them with appropriate protective equipment.

4) Ignition source reduction

Both OSHA regulations and NFPA standards should be reviewed for compliance. Hazard reduction measures may include: having all electrical equipment in a hazardous environment conform with the requirements of the National Electric Code (NFPA-70), grounding tanks to dissipate static charge, using only "non-spark producing" tools and equipment in flammable atmospheres, and taking care to not create sufficient heat or sparks to cause ignition of flammable vapors.

INFORMATION RESOURCES FOR HAZARD REDUCTION

The above information is for general guidance only. References with information about the hazards of catastrophic failures and methods of minimizing them are listed below. Regulations potentially applicable to storage tanks and codes and standards that may be relevant are included.

For more information consult the following:

Statutes and Regulations

Section 112(r) of the Clean Air Act focuses on prevention of chemical accidents. It imposes on facilities with regulated substances or other extremely hazardous substances a general duty to prevent and mitigate accidental releases. Accident prevention activities include identifying hazards and operating a safe facility.

EPA's Risk Management Program (RMP) Rule [40 CFR 68] is intended to prevent and mitigate accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program.

EPA has tank inspection regulations under the Spill Prevention Countermeasure and Control Plan and Oil Pollution Control Act of 1990 [40 CFR119].

The Occupational Safety and Health Administration (OSHA) has the Process Safety Management Standard [29 CFR 1910.119], which includes regulations on tank inspection, fire prevention, and conduct during hot-work; regulations concerning the storage of flammable and combustible liquids [29 CFR 1910.106]; regulations concerning fire protection and prevention during welding, brazing, and cutting [29 CFR 1910.252] and regulations covering the duties and responsibilities of a fire watch [29 CFR Part 126].

Occupational Safety and Health Administration
Phone: (202) 219-8151 - Public Information
Web site: http://www.osha.gov

Codes and Standards

The American Petroleum Institute (API) has tank standards and guidelines on safe welding.

American Petroleum Institute
1220 L St NW
Washington DC 20005
Phone: (202) 682-8000
Web site: http://www.api.org

Relevant API standards include:

API Standard 620 — Design and Construction of Large, Welded, Low-Pressure Storage Tanks, ninth edition, February 1996 (includes Addendum 1, December 1996).

[*API Standard 650 comes from*] Welded Steel Tanks for Oil Storage, ninth edition, May 1993 (includes Addendum 1, December 1994; Addendum 2, December 1995; and Addendum 3, December 1996).

API Recommended Practice (RP) 651 — Cathodic Protection of Aboveground Petroleum Storage Tanks, first edition, April 1991.

API RP 652 — Lining of Aboveground Petroleum Storage Tank Bottoms, first edition, April 1991.

API Standard 653 — Tank Inspection, Repair, Alteration, and Reconstruction, second edition, December 1995 (includes Addendum 1, December 1996).

API Standard 2000 — Venting Atmospheric and Low-Pressure Storage Tanks: Non-refrigerated and Refrigerated, fourth edition, September 1992.

API RP 2003 — Protection Against Ignitions Arising Out of Static, Lightning, and Stray Current, fifth edition, December 1991.

API PUBL 2210 — Flame Arrestors for Vents of Tanks Storing Petroleum Products, second edition, 1982.

API RP 2350 — Overfill Protection for Petroleum Storage Tanks, first edition, March 1987.

The American National Standards Institute (ANSI) has the B-31.3 Refinery Piping Code and other standards and codes.

American National Standards Institute
655 15th St NW
Washington DC 20005
Phone: (202) 639-4090 or
11 West 42nd St
New York, NY 10036
Phone: (212) 642-4900
Web site: http://www.ansi.org

The American Society of Mechanical Engineers (ASME) has the Pressure Vessel Code and other codes relevant to tanks and storage vessels.

American Society of Mechanical Engineers
1828 L St NW, Suite 906
Washington DC 20036
Phone: 1 (800) 843-2863 or (202) 785-3756
Publications and membership 1 (800) 843-2763
Codes and standards (212) 705-8500
Accreditation and certification programs (212) 705-8581
Web site: http://www.asme.org

The American Society of Nondestructive Testing (ASNT) certifies welding and non-destructive examination (NDE) and non-destructive testing (NDT) inspectors.

American Society of Nondestructive Testing
P.O. Box 28518
1711 Arlingate Lane
Columbus, OH 43228
Phone: 1 (800) 222-2768 or (614) 274-6003
Web site: http://www.asnt.org

The American Welding Society (AWS) certifies welding inspectors with the designation AWS QC-1 (Quality Control) Welding Inspector and has guidelines on safe welding.

American Welding Society
550 NW LeJeune Rd
Miami, FL 33126
Phone: 1 (800) 443-9353 or (305) 443-9353
Web site: http://www.amweld.org

The National Fire Protection Association (NFPA) has lightning and flammable/combustible liquid codes.

National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
Phone: (617) 770-3000
Customer Service: 1 (800) 344-3555
Web site: http://www.nfpa.org

Relevant NFPA codes include:
NFPA 30 — Flammable and Combustible Liquid Code, 1996 edition.
NFPA 51 — Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes, 1992.
NFPA 51B — Fire Prevention in Use of Cutting and Welding Processes, 1994.
NFPA 70 — National Electric Code, 1996.
NFPA 77 — Static Electricity, 1993.
NFPA 780 — Lightning Protection Code, 1995.

Underwriters Laboratories Inc. (UL) has standards for product safety.

Underwriters Laboratories Inc.
333 Pfingsten Rd
Northbrook, IL 60062
Phone: (847) 272-8800
Web site: http://www.ul.com

Relevant UL standards include:
UL-142 — Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, 1993.

CHEMICAL ACCIDENT PREVENTION: SITE SAFETY

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

PROBLEM

Facilities that handle chemicals are actively engaged in managing risks to ensure the safety of their workers and the community. Most of their efforts focus on ensuring that the facility is designed and operated safely on a day-to-day basis, using well-designed equipment, preventive maintenance, up-to-date operating procedures, and well-trained staff. Because of today's increased concern about terrorism and sabotage, companies are also paying increased attention to the physical security of facility sites, chemical storage areas, and chemical processes. All companies, big and small, should have some measure of site security in place to minimize crime and to protect company assets. This is especially true for facilities that handle extremely hazardous substances.

Under section 112(r) of the Clean Air Act (CAA), EPA developed Risk Management Program (RMP) regulations that require facilities to examine their chemical accident risk and develop a plan to address it. The increased concern for the physical security of facilities that handle extremely hazardous substances is also reflected in recent government actions. Highlighting site security, the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act contains a major provision that requires the Department of Justice to prepare reports to be submitted to Congress describing the effectiveness of RMP regulations in reducing the risk of criminally caused releases, the vulnerability of facilities to criminal and terrorist activity, and the security of transportation of listed toxic and flammable substances.

This Alert is intended as a public service. It highlights security areas that companies may want to review to ensure that appropriate measures are being implemented. More importantly, it provides sources of information and help to assist facilities that routinely handle chemical substances in their efforts to have secure and accident-free operations.

EXAMPLES

The following examples illustrate the range of damage that can occur at facilities handling hazardous substances because of criminal activity:

- A manufacturer uses flammable naphthalene to produce mothballs. Received in molten form, the naphthalene solidifies when cooled and looks similar to candle wax. Trespassing teenagers found the vats of naphthalene that were left outside to cool. They ignited the naphthalene and started an uncontrollable fire. Approximately 40 acres of industrial property burned, at an estimated cost of $100 million.
- Every few weeks, EPA receives reports that thieves, looking for ammonia to use to make illegal drugs, have broken into fertilizer dealers, refrigerated warehouses, or ice manufacturing facilities, frequently leaving valves open. In some cases, the thieves have been overcome by the ammonia and needed to be rescued; in other cases, the community has been evacuated, and there have been injuries to the general public and to law enforcement personnel from exposures to the released ammonia.
- There are cases where vandals have attempted unsuccessfully to break into chlorine tank cars. Fortunately, the design of the chlorine tank car includes a heavy steel dome and additional lock out devices that discourage even well-equipped vandals.

These examples illustrate the need to examine security measures at a facility, especially those handling highly hazardous substances, to guard against criminal acts, including vandalism.

AREAS OF CONCERN

Threats may come in different forms and from different sources. Threats from outside the facility could affect people and the facility itself, and may involve trespassing, unauthorized entry, theft, burglary, vandalism, bomb threats, or terrorism.

Threats from inside the facility may arise from inadequate designs, management systems, staffing or training, or other internal problems. These may include theft, substance abuse, sabotage, disgruntled employee or contractor actions, and workplace violence, among others.

Threats are not restricted to people and property, but could also involve sensitive facility information. Both facility outsiders and employees or contractors could pose threats to data storage and data transmission of, for example, confidential information, privacy data, and contract information. They could also pose a threat to computer-controlled equipment. These threats may include breaches in data access and storage, uncontrolled dissemination of information, destruction of information or threats to automated information systems.

COMMON SECURITY MEASURES

Most security measures are intended to prevent intruders from gaining access to the site or to limit damage. The following sections present a number of design and procedural approaches that facilities have successfully implemented. The appropriateness of any one of these depends on site-specific conditions that you would need to consider in assessing any security needs for your facility.

PREVENTING INTRUSION

Most facilities have some measures that are intended to prevent intruders from entering the grounds or buildings. These measures may include fences, walls, locked doors, or alarm systems. The location of the facilities and the types of structures will determine how much and what type of protection a facility needs.

In addition to basic measures, some facilities also provide physical protection of site utilities at the fence perimeter. Security lighting (good lighting around buildings, storage tanks, and storage areas) can also make it very difficult for someone to enter the facility undetected.

Some facilities augment these measures with intrusion detection systems — video surveillance, security guards at fixed posts, rounds/mobile patrols, alarm stations, and detectors for explosives and metal. If you have guards, it may be useful to consider their training in detection and response and the availability to them of equipment for appropriate protective force.

To protect against unauthorized people coming in through normal entrances, security clearances, badges, procedures for daily activities and abnormal conditions, as well as vehicular and pedestrian traffic control, can provide efficient access for employees while ensuring that any visitors are checked and cleared before entering.

Most facilities have procedures to recover keys from employees who leave and to immediately remove the employee's security codes from systems. At times it may be wise to consider additional measures, such as changing locks, when a disgruntled employee leaves.

LIMITING DAMAGE

In addition to protecting a facility from intruders, it is important to limit the damage that an intruder (whether physically at the site or "hacking" into the company's computers) or an employee could do. Most of the steps to limit damage are probably things you already do as part of good process safety management, because they also limit the loss of chemicals if management systems or equipment fails or an operator makes a mistake. These steps can be related to either the design of the facility and its processes or to procedures implemented.

Facility Design

A well-designed facility, by its layout, limits the possibility that equipment will be damaged and, by its process design, limits the quantity of chemical that could be released. Facility and process design (including chemicals used) determine the need for safety equipment, site security, buffer zones, and mitigation planning. Eliminating or attenuating to the extent practicable any hazardous characteristic during facility or process design is generally preferable to simply adding on safety equipment or security measures.

The option of locating processes with hazardous chemicals in the center of a facility can thwart intruders and vandals who remain outside the facility fence-line. Transportation vehicles, which are usually placarded to identify the contents, may be particularly vulnerable to attack if left near the fence-line or unprotected. However, for some facilities and processes, the option of locating the entire process at the center of the site may not be feasible. You may need to consider external versus internal threats, such as the threat to workers if an accidental release occurs, or the access to the process in case of an emergency response.

Where feasible, providing layers of security will protect equipment from damage. These layers could include, for example, blast resistant buildings or structures. Enclosing critical valves and pumps (behind fences or in buildings) can make it less likely that an intruder will be able to reach them, a vehicle will be able to collide with them, or that releases are compounded because of damage to neighboring equipment.

Chlorine tanker valves are an example of equipment design with several layers of security: (1) a heavy steel dome with lid; (2) a heavy cable sealing system that requires cable cutters to remove; (3) a heavy duty valve that can withstand abuse without leaking; and (4) a seal plug in each valve. As many as three different tools would be needed to breach the container's integrity.

If equipment is located where cars, trucks, forklifts, or construction equipment could collide with it or drop something on it, the equipment should be constructed from materials that could stand some abuse. In general, you should give consideration to collision protection to any equipment containing hazardous chemicals with, for example, collision barriers.

The idea of layers of security may also be applied to communications/computer security. Some companies have developed alternate capabilities and systems to protect receipt and transmission of confidential information. Backup power systems and/or conditioning systems can be important, particularly if processes are computer controlled. Access to computer systems used to control processes may need to be controlled so that unauthorized users cannot break in; appropriate computer authentication and authorization mechanisms on all computer systems and remote access may prove useful; entrance into control rooms may need to be monitored and limited to authorized personnel. For emergency communications, some companies use radios and cell phones as a backup to the regular phone system.

Well-designed equipment will usually limit the loss of materials if part of a process fails. Excess flow check valves, for example, will stop flow from an opened valve if the design flow rate is exceeded. These valves are commonly installed on chlorine tankcars and some anhydrous ammonia trailers, as well as on many chemical processes. Like excess flow valves, fail-safe systems can ensure that if a release occurs, the valves in the system will close, shutting off the flow. Breakaway couplings, for example, shut off flow in transfer systems, such as loading hoses, to limit the amount released to the quantity in the hose.

If you store hazardous liquids, you may want to consider containment systems (e.g., buildings, dikes, and trenches) that can slow the rate at which the chemical evaporates and provide time to respond. Double-walled vessels can also protect against attempts to rupture a tank.

The installation of chemical monitors that automatically notify personnel of off-hour releases could be important if your facility is not staffed during certain periods (e.g., overnight). Such monitors, however, are not available for all chemicals. The appropriateness of monitors, and any other equipment design solutions, will depend on site-specific conditions.

Procedures and Policies

Your facility's policies and procedures can also limit the damage caused by a release. As with design issues, the procedural steps you routinely take to operate safely also help protect your facility from attacks. Maintaining good labor relations may protect your facility from actions by either employees or contractors. Open negotiations, workplace policies emphasizing that violence and substance abuse are not tolerated, and adequate training and resources to support these policies are important considerations. The goal is to develop a workforce and management capacity to identify and solve problems by working together. Following are several examples of specific areas where procedures and policies can prevent or limit the damage of a release.

As a matter of good practice, as well as site security, you may consider disconnecting storage tanks and delivery vehicles from connecting piping, transfer hoses, or distribution systems when not in use. Leaving the tanks linked to the process or pipeline increases the chance of a release because the hoses or pipes are often more vulnerable than the tanks.

In addition to accurately monitoring your inventory, another practice you may want to adopt is limiting the inventory of hazardous materials to the minimum you need for your process. This policy limits the quantity of a hazardous material that could be released. You could also consider actions such as substituting less hazardous substances when possible to make processes inherently safer.

Your written procedures are also an important tool in protecting your facility. As part of your regular operating procedures, you probably have emergency shutdown procedures. These procedures, and workers trained in their use, can limit the quantity released. The procedures are particularly important if you have processes that operate under extreme conditions (high or low pressures, temperature) where rapid shutdown can create further hazards if done improperly.

As you review your contingency plan, consider, if necessary, revisions to address vandalism, bomb threats, burglary - including evaluating the desirability of your facility as a target - working with local law enforcement, and providing extra security drills and audits. Many companies find that working with local law enforcement is an effective means of evaluating security risks.

As a matter of good practice, for both process and response equipment, it is important to have a program that ensures that all equipment is subject to inspection and to corrective and preventive maintenance. In this way, you can be sure that the safety systems you install will operate as designed.

SITE-SPECIFIC DECISIONS

The steps you take to operate safely will often serve to address security concerns as well. Considering inherent safety in the design and operation of any facility will have the benefit of helping to prevent and/or minimize the consequences of any release. Before taking steps to improve site security, you may want to evaluate your current system and determine whether it is adequate. Factors you might consider include:

- The chemicals stored at your site; some chemicals may be particularly attractive targets because of the potential for greater consequences if released.
- The location of the site; sites in densely populated areas may need more security than those at a distance from populations.
- The accessibility of the site; are the existing security systems (e.g., fences, security lighting, security patrols) adequate to limit access to the site?
- The age and type of buildings; older buildings may be more vulnerable because they have more windows; some newer building are designed for easy access.
- Hours of operation; a facility that operates 24-hours day may need less security than a facility that is unoccupied at night.

Decisions about improving site security should be made after evaluating how vulnerable your site is to threats and what additional measures, if any, are appropriate to reduce your vulnerability. Each facility should make its own decision based on its circumstances.

IT IS YOUR DUTY

If you produce, process, handle, or store extremely hazardous substances you have, under the Clean Air section 112(r)(1), a general duty "to identify hazards which may result from such releases, using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."

INFORMATION SOURCES

Several organizations (e.g., ASTM, ANSI) have standards for site security or include site security issues in their codes. The National Fire Protection Association (NFPA) has a standard NFPA- 601, Standard for Site Security Services for Fire Loss Prevention. The American Petroleum Institute addresses security issues in RP 554, Process Instrumentation and Control. Likewise, the Chemical Manufacturers Association addresses this issue through the Responsible Care Employee Health and Safety Code Site Security Management Practice. Protocols developed under the Responsible Distribution Process K cover security concerns. You can contact the following websites for additional security information:

- www.energysecuritycouncil.org The Energy Security Council is a national industry association to assist law enforcement agencies and energy companies in combating all types of criminal activity.
- www.nfpa.org The National Fire Protection Association provides standards, research, training, and education to reduce the burden of fire and other hazards.
- www.nsc.org The National Safety Council provides general safety information on chemical and environmental issues.
- www.asisonline.org www.securitymanagement.com The American Society for Industrial Security develops educational programs and materials that address security concerns. Its Security Management Magazine site provides an online version of its magazine.
- www.siaonline.org The Security Industry Association provides general security information.
- www.atsdr.cdc.gov The Agency for Toxic Substances and Disease Registry site provides a 10-step procedure to analyze, mitigate, and prevent public health hazards resulting from terrorism involving industrial chemicals.
- www.aiche.org/ccps The Center for Chemical Process Safety (CCPS) is an industry-driven, non-profit professional organization affiliated with the American Institute of Chemical Engineers (AIChE). It is committed to developing engineering and management practices to prevent or mitigate the consequences of catastrophic events involving the release of chemicals that could harm employees, neighbors and the environment.
- www.cdc.gov/niosh The National Institute for Occupational Safety and Health provides multiple resources on workplace violence prevention.
- The Complete Manual of Corporate and Industrial Security, by Russell L. Bintliff (Prentice Hall, 1992) provides detailed discussions of the advantages and disadvantages of various security systems as well as checklists for security inspections.
- The Handbook of Loss Prevention and Crime Prevention, 3rd Edition, L.J. Fennelly, Ed., (Butterworth-Heinemann, 1996) includes information on conducting security surveys as well as chapters on a broad range of security subjects.
- Guidelines for Investigating Chemical Process Incidents. (AIChE/CCPS). These Guidelines establish a basis for successful investigation of process incidents to determine causes and implement changes, which can prevent recurrence. Primary focus is on incidents with catastrophic potential but the concepts should also be used for investigating environmental incidents, minor injuries, less significant property damage events, or near misses.
- Process Plants: A Handbook for Inherently Safer Design, by Trevor Kletz. (Taylor & Francis 1998) illustrates the principles of inherent safety and demonstrates the advantages of considering safety approaches in the design stages of a process.
- Inherently Safer Chemical Processes: A Life Cycle Approach. (AIChE/CCPS) This book presents the principles and strategies for applying inherently safer thinking from the start of the life cycle to the very end.

STATUTES AND REGULATIONS

The following are a list of some federal statutes and regulations related to process safety management and accident prevention:

EPA

Clean Air Act (CAA)

- General Duty Clause [Section 112(r)(1) of the Act] - Facilities have a general duty to prevent and mitigate accidental releases of extremely hazardous substances.
- Risk Management Program (RMP) Rule [40 CFR part 68] - Facilities that have a listed toxic or flammable substance above a certain threshold are required to develop a hazard assessment, a prevention program, and an emergency response program.

Chemical Safety Information, Site Security and Fuels Regulatory Relief Act

- A major provision requires the Department of Justice to submit reports to Congress describing the effectiveness of the RMP regulations in reducing the risk of criminally caused releases, the vulnerability of facilities to criminal and terrorist activity, and the security of transportation of substances listed under CAA Section 112(r).

Emergency Planning and Community Right-to-Know Act (EPCRA)

- Emergency Planning [40 CFR part 355] Facilities that have listed chemicals above a certain threshold must report to their Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC) and comply with certain requirements for emergency planning.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- Under the authority of CERCLA, EPA's Chemical Safety Audit program examines site security as part of a standard audit protocol.

Clean Water Act (CWA) as Amended by the Oil Pollution Act of 1990 (OPA)

- Spill Prevention Control and Countermeasures Plan (SPCC) [40 CFR part 112] - Facilities storing oil above a certain threshold must prepare and implement an SPCC plan. These plans need to address security elements such as locks, guards, access, lighting, and vandalism.

OSHA

- General Duty Clause [OSH Act section 654] Employers are required to provide a safe workplace free of recognized hazards.
- Process Safety Management (PSM) Standard [29 CFR 1910.119] - Facilities that have a highly hazardous substance above a certain threshold are required to implement a number of actions to manage hazards including performing a process hazards analysis and maintaining mechanical integrity of equipment. External threats must be considered when conducting a process hazard analysis.
- C Hazard Communication Standard [29 CFR 1910.1200] - Facilities handling hazardous chemicals must maintain information on the hazards and train employees in how to handle the chemicals safely and protect themselves if exposed.

Other OSHA regulations address some security issues for specific types of hazardous materials (e.g., flammables).

Department of Transportation

- The US Department of Transportation has a number of regulations that address security at transportation terminals. These regulations can be found in Titles 14, 33, and 49 of the Code of Federal Regulations.

EXPLOSION HAZARD FROM AMMONIUM NITRATE

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements but by understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations. EPA will publish Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Ammonium nitrate primarily is used as a fertilizer; it also is used widely with additives as a blasting agent. Millions of tons of this chemical are produced annually throughout the world and handled without incident. According to scientific literature, ammonium nitrate is a strong oxidizer and a relatively stable explosive. For the purpose of transportation, ammonium nitrate with less than 0.2 percent combustible substances and ammonium nitrate fertilizers are classified by the U.S. Department of Transportation as oxidizers.

Ammonium nitrate with more than 0.2 percent combustible substances is classified as an explosive. Ammonium nitrate can be exploded under certain conditions. These must include added energy (heat, shock), especially under conditions of confinement or presence of contaminants. Although ammonium nitrate generally is used safely and normally is stable and unlikely to explode accidentally, accidental explosions of ammonium nitrate have resulted in loss of lives and destruction of property. These accidents rarely occur, but when they do, they have high impacts. Many of the safe handling procedures were developed after learning from these accidents.

ACCIDENTS

In a 1994 accident, ammonium nitrate solution exploded during a manufacturing process, causing a number of deaths and injuries. In this process, ammonia and nitric acid were reacted in a neutralizer vessel to produce 83 percent ammonium nitrate solution for use in fertilizer.

At the time of the accident, the neutralizer contained approximately 164,000 pounds of ammonium nitrate.

During a procedure to shut down the process, compressed air was applied to the nitric acid line into the neutralizer, followed by pressurized steam at 200 pounds per square inch gauge (psig) and temperatures up to 430F.

After the steam had passed through the nitric acid line for several hours, the ammonium nitrate exploded in the neutralizer.

EPA believes localized areas of the ammonium nitrate solution were heated to high temperatures by the steam. The compressed air and steam created bubbles in the solution.

The solution was highly acidic and was contaminated by chlorides. EPA believes the acidic conditions, bubbles, localized high temperatures, and chloride contamination contributed to the explosion.

Another explosion occurred in 1989, during the manufacture of ammonium nitrate by a high temperature process.

In this case, upset conditions allowed prolonged exposure of ammonium nitrate to temperatures up to 500f under high pressure and low pH (acidic).

Other past accidental explosions of ammonium nitrate have included some of the most destructive on record.

Several of these, including two in Germany in 1921, occurred during attempts to break up large piles of solidified or caked ammonium nitrate-ammonium sulfate mixtures using a blasting explosive.

The blasting initiated explosions in the ammonium nitrate-ammonium sulfate mixtures.

Other large explosions were triggered by fires involving ammonium nitrate in confined spaces, including the 1947 explosion of two cargo ships.

A fire in the hold, involving ammonium nitrate fertilizer coated with wax and stored in paper bags, caused the explosion of the first ship; the ammonium nitrate in the second ship exploded some time later, apparently as a result of a fire caused by the first explosion.

As a result of such accidents and subsequent studies of the properties of ammonium nitrate, caked ammonium nitrate no longer is broken up with blasting agents, and wax coatings are no longer used for ammonium nitrate fertilizer.

Explosions of ammonium nitrate, involving relatively small quantities, have occurred during the preparation of nitrous oxide.

In these cases (e.g., an explosion in 1977), the explosions of ammonium nitrate occurred as a result of excessively high temperatures and confinement during processing.

Two explosions of ammonium nitrate solutions that occurred during processing at ordnance plants during the Second World War were believed to be caused by the explosion of a small amount of ammonium nitrate in a blocked pipe, which then initiated the explosion of a larger quantity of solution.

HAZARD AWARENESS

Ammonium nitrate, in solid or molten form or in solution, is a stable compound and generally is difficult to explode. Ammonium nitrate may explode, however, when exposed to strong shock or to high temperature under confinement.

In a large quantity of ammonium nitrate, localized areas of high temperature may be sufficiently confined by the total quantity to initiate an explosion.

The explosion of a small quantity of ammonium nitrate in a confined space (e.g., a pipe) may initiate the explosion of larger quantities (e.g., in an associated vessel).

Contaminants may increase the explosion hazard of ammonium nitrate.

Organic materials generally will make ammonium nitrate explosions more energetic.

Ammonium nitrate may be sensitized by certain inorganic contaminants, including chlorides and some metals, such as chromium, copper, cobalt, and nickel.

As ammonium nitrate solution becomes more acidic, its stability decreases, and it may be more likely to explode.

Low density areas, such as bubbles, in molten ammonium nitrate or solutions, also may increase the possibility of an explosion and enhance the propagation of an explosion.

Ammonium nitrate by itself does not burn, but in contact with other combustible materials, it increases the fire hazard. It can support and intensify a fire even in the absence of air. Fires involving ammonium nitrate can release toxic nitrogen oxides and ammonia.

A fire involving ammonium nitrate in an enclosed space could lead to an explosion. Closed containers may rupture violently when heated.

PROCESS SAFETY AREAS FOR HAZARD REDUCTION

Facilities should be aware of the hazards of ammonium nitrate and ensure that the conditions that may lead to an explosion are not present. Actions that may help to prevent explosions include:

- Avoid heating ammonium nitrate in a confined space (e.g., processes involving ammonium nitrate should be designed to avoid this possibility).
- Avoid localized heating of ammonium nitrate, potentially leading to development of high temperature areas.
- Ensure that ammonium nitrate is not exposed to strong shock waves from explosives.
- Avoid contamination of ammonium nitrate with combustible materials or organic substances such as oils and waxes.
- Avoid contamination of ammonium nitrate with inorganic materials that may contribute to its sensitivity to explosion, including chlorides and some metals, such as chromium, copper, cobalt, and nickel.
- Maintain the pH of ammonium nitrate solutions within the safe operating range of the process. In particular, avoid low pH (acidic) conditions.

INFORMATION RESOURCES

Some references that contain information about the hazards of ammonium nitrate and methods of minimizing these hazards are listed below. Regulations applicable to the manufacture of or processes involving ammonium nitrate, and codes and standards that may be relevant, are also listed.

General References

The following references and organizations provide information on ammonium nitrate and its hazards.

- Sax's Dangerous Properties of Industrial Materials, Ninth Edition. New York: Van Nostrand Reinhold (1996).
- Kirk-Othmer Encyclopedia of Chemical Technology, Fourth Edition, Volume 2. New York: John Wiley & Sons (1992).
- The National Fire Protection Association (NFPA) includes information on ammonium nitrate in its publication NFPA 49— Hazardous Chemicals Data, 1994. This publication provides guidance on hazardous chemicals to emergency personnel and others. National Fire Protection Association
- The National Safety Council has a data sheet titled "Ammonium Nitrate Fertilizer, Data Sheet I-699, Rev. 91" that discusses the health hazards, properties, and precautions for safe storage and handling of ammonium nitrate fertilizer. National Safety Council
- The Fertilizer Institute possesses information on various fertilizer products, including ammonium nitrate, and their uses. The Fertilizer Institute

Statutes and Regulations

- Section 112(r) of the Clean Air Act focuses on prevention of chemical accidents. It imposes on facilities with regulated substances or other extremely hazardous substances a general duty to prevent and mitigate accidental releases. This general duty would apply to hazards associated with ammonium nitrate. Accident prevention activities include identifying hazards and operating a safe facility.
- EPA's Risk Management Program (RMP) Rule (40 CFR 68) is intended to prevent and mitigate accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program. While ammonium nitrate is not a 112(r) listed substance, chemicals used in the production of ammonium nitrate are included on the 112(r) list. Certain processes using ammonium nitrate may also involve listed substances.
- The Department of Transportation (DOT) regulates transportation of ammonium nitrate under its Hazardous

Materials Regulations. Ammonium nitrate is listed in DOT's Hazardous Materials Table (49 CFR 172.101).

- The Occupational Safety and Health Administration (OSHA) regulates the manufacture, keeping, having, storage, sale, transportation, and use of explosives and blasting agents under its Occupational Safety and Health Standards for explosives and blasting agents (29 CFR 1910.109). Blasting agents are frequently formulated with ammonium nitrate.
- OSHA's Process Safety Management Standard establishes procedures intended to protect employees by preventing or minimizing the consequences of chemical accidents involving highly hazardous chemicals (29 CFR 1910.119). Although ammonium nitrate is not covered by the PSM standard, the production or use of ammonium nitrate may involve listed chemicals in excess of thresholds. Manufacture of explosives, which may involve ammonium nitrate, also is covered by the PSM standard.
- The Bureau of Alcohol, Tobacco, and Firearms of the Department of the Treasury regulates the importation, manufacture, distribution, and storage of explosive materials (27 CFR 55), including blasting agents and other explosives containing ammonium nitrate.

Codes and Standards

- NFPA has developed a code for storage of ammonium nitrate, including mixtures containing 60 percent or more by weight of ammonium nitrate, and a code for explosives that would apply to blasting agents and explosives containing ammonium nitrate. These codes, which may be adopted into law at the state or local level, are:
  - NFPA 490 -- Storage of Ammonium Nitrate, 1993, and
  - NFPA 495 -- Explosive Materials Code, 1996.

Accident Investigation Report

EPA investigated the ammonium nitrate explosion that occurred in 1994 and developed the following report:

- United States Environmental Protection Agency, Region 7, Emergency Response and Removal Branch, Kansas City, KS, Chemical Accident Investigation Report — Terra Industries, Inc., Nitrogen Fertilizer Facility, Port Neal, Iowa

CHEMICAL SAFETY ALERT – EPA-550-F-01-010, September, 2001

CHEMICAL ACCIDENTS FROM ELECTRIC POWER OUTAGES

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required.

EPA publishes chemical safety Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Problem

Power outages and restarts could potentially trigger a serious chemical accident. Electric power outages are often caused by lightning, high wind, or ice storms, as well as accidents at power plants or transmission lines.

Hot weather power demands could trigger rolling blackouts. Although planned rolling blackouts can cause process shutdowns or upsets, they are preferable to power system overloads and failure, or to low voltage brownouts which can be destructive to electrical equipment.

The recent energy crisis in California illustrates the aggravation caused by power outages. Power interruptions at chemical handling facilities are a particular concern because of the possibility of a chemical accident.

Incident data from the National Response Center (NRC) shows that during 2000 there were about 240 chemical releases reported due to an electric power interruption; only a few were related to planned rolling blackouts. A number of releases were associated with power resumption and restart of operations (see Table 1).

Accidents

One accident occurred when power was interrupted and another during restart after power resumption. Gramercy, Louisiana, July 1999. This plant converts bauxite to alumina in a series of steam-heated pressure vessels.

A loss of power stopped all pumps including those that circulated process material through heat exchangers for cooling. However, steam injection stayed on causing temperatures and pressures to increase.

Pressure relief valves and piping were blocked or choked with solid deposits hindering their ability to relieve the increasing pressure. Several vessels over-pressured and exploded.

The force of the explosion and release of highly corrosive caustic material injured 29 employees and extensively damaged the plant.

Several lessons can be learned from this accident: Process operations must be evaluated for the consequences associated with a power outage to ensure that the process reaches a safe condition.

In this case, if process flow and cooling pumps are critical to the safe state of the process when electric power is lost, then a backup power supply or steam driven spare or backup pumps should be evaluated.

In addition, interlocks that stop steam heating upon loss of flow or cooling should be considered.

Finally, pressure relieving systems must be inspected and maintained to ensure their ability to function as intended.

Richmond, California, May 2001. This plant was running normally when a truck struck a utility pole, causing a power interruption and total plant shutdown. Shortly thereafter, sulfur dioxide ($SO2$) and sulfur trioxide ($SO3$) began to escape from a boiler exit flue.

When power was restored a short time later, a steam turbine that is required to keep the boiler exit flue under negative pressure could not be immediately restarted.

Troubleshooting revealed that an automatically controlled governor valve had malfunctioned and the turbine was restarted. During the time the turbine could not be restarted, residents near the plant were instructed to remain indoors.

Around 50 to 100 individuals sought medical attention following the release.

As above, equipment or procedures critical to safe shutdown, continued operation, or restart conditions must be identified, maintained, tested, and kept in a ready-to-operate state.

The plant installed backup power systems to keep the steam-turbine running through a power outage. In addition, preventative maintenance on the steam turbine valves has been enhanced to ensure that these valves operate properly when needed.

Table 1. Some chemical release causes reported to the NRC during 2000:

- Fueling pump automatically restarted when interrupted power was restored;
- Power outage during product transfer caused tank and secondary containment overflow;
- Power outage to computer control system during startup caused release from pressure relief;
- Utility company's hot weather power reduction caused plant's excessive flaring;
- Power loss caused shutdown and valves did not close;
- Scheduled power outage caused flaring; and
- Power outage caused shutdown of pollution control device and release of material.

Hazard Identification

Find potential weak spots early or ultimately they will find you! When power is lost for any reason, pumps stop pumping, compressors stop running, stirrers quit mixing, lights go out, and instruments and controls may malfunction.

These equipment outages may lead to tank overflows, runaway chemical reactions, temperature or pressure increases or decreases, all of which could lead to a spill, explosion, or fire.

Even if there is no immediate release, there may be a delayed reaction caused by thermal shock or other factors that can compromise equipment mechanical integrity during subsequent operation.

When power is restored even after a brief interruption, some equipment may automatically restart before process operations are ready while others may need to be reset and manually restarted.

The first task is to identify and rank the process operations or equipment that pose the most serious potential for fire, explosion, or hazardous material release in the event of utility interruption.

A good tool that can help identify and rank critical equipment and the consequences to the process upon loss of power is a formal process hazard analysis (PHA) within a sound process safety management system (PSM).

For example, the Hazard and Operability (HazOp) or What-If analysis techniques coupled with good employee participation is a particularly strong combination for identifying hazards and failure mechanisms associated with power failure and restart.

These tools and approaches can help you create a list of process equipment (pumps, valves, instruments) and to note exactly what happens to each device when power fails or is restored.

Don't forget to include equipment that may be indirectly affected; for example, pneumatic devices that quit when air pressure falls because an electric-powered compressor stops.

Equipment should "fail-safe;" in other words, when electric power or another utility (e.g. air or water) is lost, the equipment and process should come to a safe condition.

And when power is restored, devices should keep the process in a safe condition until it is ready to resume normal operations.

Table 2 shows an example list of some devices and possible fail-safe and restored states.

Be sure to consider power dips, brief interruptions, and losses to only some equipment in your hazard evaluation as unexpected and unusual circumstances may occur. For example, some equipment may continue operating while others trip out.

Most chemical facility operators have developed sound contingency plans for responding to various types of plant utility interruptions, including electric power outages.

After a power failure is over, evaluate how the process equipment and people responded to the situation to identify hazards and potential negative consequences that were not previously recognized.

In some cases the type and magnitude of the disruption that occurred when power was interrupted was not fully anticipated.

In other cases the problem was caused by adverse actions that took place when power was restored.

Power failure contingency plans should be regularly reviewed, updated and tested.

Table 2: Sample Equipment List and Fail-Safe Modes

Device	Status When Power Fails:	When Power is Restored:
Reactor Feed Pump	Off	Off - manual restart
Reactor Steam Heat Valve	Closed	Closed until reset
Cooling Water Feed Valve	Full open	Open per temp. control
Reactor Vent Valve	Full open	Open per pressure control
Reactor Mixer	Off	Off - manual restart
Transfer Pump	Off	Off - manual restart

Problem Reduction

What actions should be taken to help neutralize the impact of the hazards identified above? Using the results of the hazard evaluation, make sure that all process operations and equipment will reach a fail-safe mode upon loss of power.

Make sure that devices you expect to operate upon loss of power are inspected, maintained, and tested as part of your equipment preventative maintenance program. And make sure that operating procedures and training address these hazards.

Prepare plans and checklists and consider backup power systems to maintain critical services as described below.

Other actions that should be taken to prevent, prepare for, and respond to chemical emergencies triggered by power failure and resumption can be addressed by four categories:

1) preparing for an emergency forced shutdown such as with a rolling blackout or an approaching electrical storm;
2) preparing for immediate actions from an unexpected power loss;
3) restarting when power is restored; and
4) (4) equipment to enhance continuity of critical services.

1. **Emergency Forced Shutdown.** Sometimes there may be a warning or brief notification, perhaps only a few minutes, that a rolling blackout or other outage (steam, instrument air, cooling water) is about to occur. Many companies have developed an Emergency Forced Shutdown Plan (EFSDP).

   This Plan addresses only those priority actions that need to be taken immediately if a power outage is imminent. The objective is to make the best use of the short time available to bring the plant to a safe shutdown condition and avoid unnecessary upsets that may be driven by a loss of power.

   The Plan should also address follow-up steps that could be taken if time permits and further steps to secure the unit or process after the outage. Finally, the Plan should also include "load shedding" steps to shut down less important operations, and thus conserve power, steam, cooling water, or instrument air for the most critical operations. This Plan should be well thought out, reviewed with all involved employees, and periodically tested.

2. **Power Outage: Immediate Action Steps**. As described above, when power dips or is interrupted unexpectedly, equipment should reach a fail-safe condition as specified and designed by you as a result of your hazard evaluation.

   Consider developing a checklist or other tools for employees to use to ensure that safe conditions are reached.

   As described above, the checklist might show the fail-safe mode for critical equipment and steps such as closing valves in reactor feed lines or fuel supplies to fired heaters, starting auxiliary power generators, and switching to steam or diesel driven backup pumps or compressors for critical services.

   In addition, steps need to be taken to ensure that there isn't an unintended action when power is restored and to get ready for restart. Table 3 shows some lists of equipment and other checks that may need to be performed after a power outage.

   Immediately following a brief interruption, there may be a strong desire to quickly get the process back on-line. Rushing to put a unit, process, or certain equipment back on-line may compound problems associated with the outage as described below.

3. **Restarting When Power is Restored.** When power is restored, there are a number of steps that should be taken to ensure the process (1) remains in a safe mode and (2) it is ready to return to operation.

   Also, if the process remained on-line using backup systems, it must be returned to normal operation. As mentioned above, facilities may want to develop plans, procedures, and checklists for restarts or restoring backup services.

   Since power outages are often very short, consider developing preplanned warm restart procedures for certain units, processes or equipment. A warm restart procedure addresses the unique circumstances that might arise if a unit is not completely shutdown before power is restored and the unit restarted.

   Be sure that other necessary support utilities (steam, instrument air, cooling water, flare gas system, fire fighting systems, etc.) have been returned to service and are fully operational before restarting operations.

   Caution: After a very brief outage, there may be a temptation to quickly restart certain process operations to avoid the hassle of warm restart or complete shutdown and restart procedures.

   Explosions and accidental releases have occurred when, for example, fired heaters and furnaces were restarted without proper purges or following all prescribed safety steps.

   Some equipment must be brought completely down and purged, then put back into service following prescribed steps. The warm restart procedure must address the process equipment that must first be stabilized and checked out before restarting, even for a brief outage.
4. Continuity of Critical Services. As described above in the Hazard Identification section, if there is critical equipment that needs to operate to ensure the safe state of the process or work area, facilities should install backup power supplies and services. Services such as emergency pumps, lighting, alarms, and instruments and

controls, particularly computer operated distributed control systems (DCS) may need to operate using backup power generators or uninterrupted power supplies (UPS).

Steam or diesel driven pumps should be considered to maintain critical flows while a process is shutting down or otherwise dealing with the power outage. And as with all critical equipment and procedures, they should be maintained, tested, and verified for operation regularly.

Caution: Backup power generators must be selected and installed by a qualified electric service contractors or facility personnel.

It is particularly important to avoid improper switching which can lead to power being fed back into the regular power system.

This feedback can cause equipment damage and injury. The utility company should be notified of the installation of any backup generators.

Recent experiences at large, well established organizations as well as small and medium size operations have verified that a greater awareness of the hazards of power failure and restart is necessary, especially with thunderstorms and greater electricity demands in hot weather or ice storms in freezing weather.

Facilities should re-examine and ensure that all hazards are identified and addressed and that equipment, procedures and staff are developed, maintained, and ready so that chemical accidents are prevented and those that do occur are mitigated.

Table 3. Sample Check Lists of steps that may need to be performed following a Power Outage:

- List manually operated switches that may need to be moved to the “off” position;
- List valves that need to be checked for proper position;
- List utilities such as steam, instrument air, nitrogen blanketing, cooling water, flare system, fuel system, radio telephone, pager communications, etc. that need to be verified for operability;
- Check backup power generators, fire fighting systems, and other emergency response equipment for operability;
- Verify feedstock inventory and availability of product storage free space;
- List instrument controls, alarms, detection devices, automatic shutdown or trip out devices that must be reset or have operability verified;
- List automatic startup power consuming equipment that should be shut down for safety and to minimize load demand when power is restored; and
- List upstream and downstream and other affected parties to be notified of shutdown.

FIRE HAZARD FROM CARBON ADSORPTION DEODORIZING SYSTEMS

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. Under CERCLA, section 104(e) and Clean Air Act (CAA), EPA has authority to conduct chemical accident investigations. Additionally, in January 1995, the Administration asked the Occupational Safety and Health Administration (OSHA) and EPA to jointly undertake investigations to determine the root cause(s) of chemical accidents and to issue public reports containing recommendations to prevent similar accidents.

EPA has created a chemical accident investigation team to work jointly with OSHA in these efforts. Prior to the release of a full report, EPA intends to publish Alerts as promptly as possible to increase awareness of possible hazards. Alerts may also be issued when EPA becomes aware of a significant hazard. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Activated carbon systems used to adsorb vapors for control of offensive odors may pose a fire hazard when used for certain types of substances, if proper procedures are not followed.

In particular, crude sulfate turpentine, commonly produced in the pulp and paper industry, can pose a fire hazard if the adsorption system is not properly designed and proper procedures are not implemented. Facilities should take precautions to avoid or mitigate these fire hazards.

ACCIDENTS

In a 1995 accident at a chemical terminal facility, a fire and explosion occurred involving three tanks of crude sulfate turpentine. The tanks were connected to drums of activated carbon for deodorizing. The fire and explosion damaged other storage tanks, resulting in the release of toxic gases and forcing a large-scale evacuation of area residents.

Fires have occurred in the past in activated carbon systems used for deodorizing crude sulfate turpentine. In general, such fires have not had effects as serious as those reported in the 1995 fire.

Serious effects would not be expected if fires are confined to the activated carbon containers and do not spread to tanks containing flammable or combustible substances.

HAZARD AWARENESS

Activated carbon is widely used to adsorb vapors to prevent their release to the air. For certain classes of chemicals, reaction or adsorption on the carbon surface is accompanied by release of a large amount of heat that may cause hot spots in the carbon bed. Such chemicals include organic sulfur compounds (e.g., mercaptans), which may be found as impurities in crude sulfate turpentine and other materials.

Other classes of chemicals that may cause large thermal releases are ketones, aldehydes, and some organic acids. Adsorption of high vapor concentrations of organic compounds also can create hot spots. If flammable vapors are present, the heat released by adsorption or reaction on the surface of the carbon may create a fire hazard (e.g., a fire may start if the temperature reaches the auto-ignition temperature of the vapor and oxygen is present to support ignition).

The fire hazards of carbon adsorption deodorizing systems may increase at night. At certain times (typically during the day), high temperatures may lead to the expansion of vapor in the system, and vapor is likely to exit to the atmosphere. When temperatures drop (typically at night), a slight vacuum may be created, causing air to be drawn into the system. If the carbon surface is very hot, because of the heat generated by adsorption, air drawn in over the carbon may provide the oxygen to start a fire.

HAZARD REDUCTION

Facilities should be aware of the potential fire hazards of activated carbon systems for absorbing flammable vapors and take steps to minimize these hazards. Actions that may help to prevent fires include:

- Follow the manufacturer's instructions for design and operation of activated carbon adsorption systems.
- Ensure that a qualified engineer or technician supervises the design, construction, and operation of the carbon adsorption system.
- Evaluate the composition of the vapors that will contact the carbon and heed the manufacturer's warnings about potential hazardous interactions with the carbon. If the vapor may contain organic sulfur compounds (e.g., vapor from crude sulfate turpentine), ketones, aldehydes, or organic acids, or if the vapor contains high concentrations of organic compounds, consider the potential for development of hot spots on the carbon.
- Test the action of the vapors on carbon for potential heat release before putting the carbon adsorption system into service, if possible reactions are not known.
- If test results or known reactions with carbon indicate the potential for fires in the activated carbon system, design the system so that air does not enter the system over the carbon bed (e.g., install vacuum breakers on the storage tanks).

- If the potential exists for fires in the activated carbon system, be sure the carbon containers are separated from containers of flammable or combustible substances and can be easily and rapidly removed in case the container becomes hot or catches fire.
- If high concentrations of organic compounds may cause development of high temperatures, take steps to control the heating. Such steps may include diluting inlet air, time weighting the inlet concentration to allow heat to dissipate, and pre-wetting the carbon.
- Visually inspect activated carbon adsorption systems frequently for hot spots and fires.
- Before using an activated carbon adsorption system, ensure that safety systems are in place for fire prevention and mitigation, including flame arrestors to prevent the spread of fire from the carbon containers to the flammable chemical containers.
- Ensure that flammable and combustible chemicals connected to activated carbon adsorption systems are handled in accordance with applicable regulations, codes, and standards.

INFORMATION RESOURCES

Some references that may contain information about the fire hazards of activated carbon adsorption systems and methods of minimizing them are listed below. Regulations applicable to such systems, and codes and standards that may be relevant, are also listed.

For more information consult the following:

General References

Information on carbon adsorption systems for crude sulfate turpentine can be found in W.A. Harrell, J.O. Sewall, and T.J. Walsh, "Control of Malodorous Compounds by Carbon Adsorption," American Institute of Chemical Engineers, Loss Prevention, Volume 12, 1979, pp 124-127.

Manufacturers of activated carbon can provide product literature with information on properties, safe handling, and use.

Statutes and Regulations

Section 112(r) of the Clean Air Act focuses on prevention of chemical accidents. It imposes on facilities with regulated substances or other extremely hazardous substances a general duty to prevent and mitigate accidental releases. Accident prevention activities include identifying hazards and operating a safe facility.

EPA's Risk Management Program (RMP) Rule [40 CFR 68] is intended to prevent and mitigate accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program.

Processes containing flammable gases and liquids may be covered under the Occupational Safety and Health Administration's (OSHA) Process Safety Management Standard, which establishes procedures intended to protect employees by preventing or minimizing the consequences of chemical accidents involving highly hazardous chemicals [29 CFR 1910.119].

OSHA also has a Standard for Flammable and Combustible Liquids [29 CFR 1910.106].

Occupational Safety and Health Administration Phone: (202) 219-8151 - Public Information Web site: http://www.osha.gov

The Department of Transportation (DOT) regulates transportation of activated carbon and other flammable and combustible substances under its Hazardous Materials Regulations. Activated carbon and many combustible and flammable substances are listed individually, and several categories of flammable and combustible substances are included, in DOT's Hazardous Materials Table [49 CFR 172.102]. Department of Transportation Phone: (202) 366-5580 - Public Information Web site: http://www.dot.gov

Codes and Standards

The National Fire Protection Association (NFPA) has a code for flammable and combustible liquids that may be adopted into law at the state or local level. NFPA 30 — Flammable and Combustible Liquids Code, 1996.

FIRST RESPONDER'S ENVIRONMENTAL LIABILITY DUE TO MASS DECONTAMINATION RUN-OFF

HOME

The Environmental Protection Agency (EPA) is issuing this alert as part of its ongoing effort to provide information on environmental issues related to biological, chemical, and nuclear terrorist incidents. EPA publishes Alerts to increase awareness of possible hazards and environmental concerns. It is important that SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

On April 19, 1999, the Team Leader of the Chemical Weapons Improved Response Team (CWIRT), U.S. Army Soldier and Biological Chemical Command sent a letter to EPA raising issues concerning first responders' liability during a weapons of mass destruction (WMD) terrorist incident. Specifically, the CWIRT asked about the first responders' liability for spreading contamination while attempting to save lives.

Environmental liability resulting from critical lifesaving actions may seem unlikely, but could be a serious concern for many first responders. The question is: Can emergency responders undertake necessary emergency actions in order to save-lives in dire situations without fear of environmental liability even when such emergency actions have unavoidable adverse environmental impacts?

This concern is not limited to WMD terrorist incidents, it has implications for our National Response System (NRS) and frequently is discussed in the hazardous materials response community.

THE NERVE AGENT DRILL

The federal government recently sponsored a multi-agency drill based on a simulated nerve-agent attack. The release of the nerve agent resulted in hundreds of simulated casualties who survived the initial terrorist attack. The hazmat team had to rescue and decontaminate these "survivors" before they could receive medical attention. The hazmat team identified the need to collect the water used to decontaminate the victims (deconwater) to avoid a release to the environment.

During the drill, these very capable, well-equipped, well-intentioned, professional hazmat teams delayed their initial entry for more than one hour, awaiting the arrival and set-up of pools to collect the deconwater.

While the actor-survivors were dying a slow, painful, convulsive death, state and federal officials were debating and insisting that deconwater had to be collected for proper disposal. By the time the rescuers set up the holding pools and entered the site, nearly 90 minutes later, the "survivors" had expired. The contaminated water was collected but the "victims" died.

GOOD SAMARITAN PROVISIONS

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section § 107 (d) Rendering Care or Advice, addresses this issue.

Section 107 (d) (1), often known as the "good Samaritan" provision states: "No person shall be liable under this sub chapter for costs or damages as a result of actions taken or omitted in the course of rendering care, assistance, or advice in accordance with the National Contingency Plan (NCP) or at the direction of an on-scene coordinator appointed under such plan, with respect to an incident creating a danger to public health or welfare or the environment as a result of any releases of a hazardous substance or the threat thereof."

This provision does not preclude liability for costs or damages as a result of negligence.

Releases of chemical and biological warfare agents due to a terrorist incident are considered hazardous materials incidents and therefore CERCLA §107 (d) (1) could apply, to the extent that there is a release or threatened release of a hazardous substance.

In addition, §107(d)(2) provides that state and local governments are not liable under CERCLA "as a result of actions taken in response to an emergency created by the release or threatened release of a hazardous substance generated by or from a facility owned by another person." Section 107(d)(2) would insulate state and local governments from potential CERCLA liability arising from first responder actions.

However, the provision does not apply to costs or damages caused by "gross negligence or intentional misconduct by the state or local government."

During a hazardous materials incident (including a chemical/biological agent terrorist event), first responders should undertake any necessary emergency actions to save lives and protect the public and themselves.

Once any imminent threats to human health and live are addressed, first responders should immediately take all reasonable efforts to contain the contamination and avoid or mitigate environmental consequences.

EPA will not pursue enforcement actions against state and local responders for the environmental consequences of necessary and appropriate emergency response actions. First responders would not be protected under CERCLA from intentional contamination such as washing hazardous materials down the storm-sewer during a response action as an alternative to costly and problematic disposal or in order to avoid extra-effort.

OTHER LIABILITY ISSUES AND STATE TORT LAWS

EPA cannot prevent a private person from filing suit under CERCLA. However, first responders can use CERCLA's Good Samaritan provision as defenses to such an action. First responders could also be subject to actions under other laws, including state tort laws. A state's tort law allows individuals and businesses to seek compensation for losses or harm caused by another. The extent of tort liability of a state or local governmental jurisdiction, as well as individual employees or representatives of that jurisdiction, is established by the tort law of each state.

The liability of governmental jurisdictions and their employees may be shaped by factors such as negligence, statutory and discretionary immunity, etc. First responders should consult legal counsel in their state to discuss authority, status as an agent of the state, immunities, and indemnification.

FEDERAL SUPPORT DURING A WMD INCIDENT

Contaminated runoff should be avoided whenever possible, but should not impede necessary and appropriate actions to protect human life and health. Once the victims are removed and safe from further harm and the site is secured and stable, the first responders should be doing everything reasonable to prevent further migration of contamination into the environment.

First responders should involve state and federal officials as soon as possible to reduce potential liability concerns. Under CERCLA, the Federal On-Scene Coordinator (FOSC) can determine which environmental regulations are applicable (or relevant and appropriate) to any removal response and may further determine that any such environmental regulation is impracticable to achieve depending on the exigencies of the situation.

If the FOSC determines that it is impracticable to comply with any particular environmental regulation, then the responders (local, state, Federal or responsible party) do not have to comply with that particular environmental regulation. By involving FOSC, first responders can substantially reduce their potential liability.

In addition, FOSCs have an expanse of resources under the NRS to support state and local responders in determining a solution which best addresses protectiveness of human health and the environment. Under the NRC, the FOSC can provide invaluable assistance in determining clean-up and decontamination needs, health criteria and appropriate clean-up protocols as needed. FOSC support is even more critical in the aftermath of a WMD terrorist attack when critical post-emergency actions such as agent identification, crime scene sampling, crime scene preservation, and long-term risk evaluation are also being conducted.

PRE-PLANNING IS KEY!

It may not be technically feasible to contain all the runoff resulting from a WMD incident, but emergency responders may be able to reduce its impact to the environment by pre-planning. Responders can maximize local resources by using existing response mechanisms as much as possible. Local Emergency Planning Committees (LEPCs) are a good starting point.

LEPCs are established under the Emergency Planning and Community Right-to-Know Act to develop local governments' emergency response and preparedness capabilities through better coordination and planning, especially within the local community. LEPCs include elected officials, police, fire, civil defense, public health professionals, environmental, hospital and transportation officials, who can work together creatively using available resources to minimize the environmental impact of WMD incidents.

HAZARDS OF AMMONIA RELEASES AT AMMONIA REFRIGERATION FACILITIES

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements, but by understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations.

EPA will publish Alerts to increase awareness of possible hazards. It is important that personnel who operate refrigeration systems, managers of facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Anhydrous ammonia is used as a refrigerant in mechanical compression systems at a large number of industrial facilities. Ammonia is a toxic gas under ambient conditions. Many parts of a refrigeration system contain ammonia liquefied under pressure. Releases of ammonia have the potential for harmful effects on workers and the public; if the ammonia is under pressure, larger quantities may be released rapidly into the air. Also, some explosions have been attributed to releases of ammonia contaminated with lubricating oil.

This Alert further discusses these potential hazards and the steps that can be taken to minimize risks. This Alert should be reviewed by personnel who operate and maintain refrigeration systems, managers of facilities, and emergency responders (e.g., hazmat teams).

ACCIDENTS

A number of accidental releases of ammonia have occurred from refrigeration facilities in the past. Causes of these releases include plant upsets leading to the lifting of relief valves; leaks in rotating seals; pipeline failures; vehicular traffic hitting pipes, valves, and evaporators; and failures during ammonia delivery, such as hose leaks. Some of these releases have killed and injured workers, caused injuries off site, or resulted in evacuations. The following describes several recent incidents in more detail.

A specific incident demonstrates the need for mechanical protection to protect refrigeration equipment from impact. In a 1992 incident at a meat packing plant, a forklift struck and ruptured a pipe carrying ammonia for refrigeration.

Workers were evacuated when the leak was detected. A short time later an explosion occurred that caused extensive damage, including large holes in two sides of the building. The fork lift was believed to be the source of ignition. In this incident, physical barriers would have provided mechanical protection to the refrigeration system and prevented a release.

Another incident highlights the need for an adequate preventive maintenance program and scheduling. In a 1996 incident in a produce cold storage facility, oil pressure got low over a long weekend in an older ammonia refrigeration system. The low oil pressure cutout switch failed and the compressor tore itself apart, resulting in a significant ammonia release. The periodic testing of the low oil pressure cutout switch against a known standard would have prevented this incident.

Two other incidents illustrate the potential for serious effects from accidental releases from ammonia refrigeration systems, although the causes of these releases were not reported. In a 1986 incident in a packing plant slaughterhouse, a refrigeration line ruptured, releasing ammonia. Eight workers were critically injured, suffering respiratory burns from ammonia inhalation, and 17 others were less severely hurt.

A 1989 ammonia release in a frozen pizza plant led to the evacuation of nearly all of the 6,500 residents of the town where the plant was located. The release started when an end cap of a 16-inch suction line of the ammonia refrigeration system was knocked off. Up to 45,000 pounds of ammonia was released, forming a cloud 24 city blocks long. About 50 area residents were taken to hospitals, where they were treated with oxygen and released, while dozens of others were treated with oxygen at evacuation centers.

HAZARD AWARENESS

Ammonia is used widely and in large quantities for a variety of purposes. More than 80% of ammonia produced is used for agricultural purposes; less than two percent is used for refrigeration. Use of ammonia is generally safe provided appropriate maintenance and operating controls are exercised. It is important to recognize, however, that ammonia is toxic and can be a hazard to human health. It may be harmful if inhaled at high concentrations. The Occupational Safety and Health Administration (OSHA.} Permissible Exposure Level (PEL) is 50 parts per million (ppm}, 8-hour time-weighted average. Effects of inhalation of ammonia range from irritation to severe respiratory injuries, with possible fatality at higher concentrations. The National Institute of Occupational Safety and Health (NIOSH) has established an Immediately Dangerous to Life and Health (IDLH) level of 300 ppm for the purposes of respirator selection. Ammonia is corrosive and can bum the skin and eyes. Liquefied ammonia can cause frostbite.

The American Industrial Hygiene Association (AIHA) has developed Emergency Response Planning Guidelines (ERPGs) for a number of substances to assist in planning for catastrophic releases to the community. The ERPG-2 represents the concentration below which it is believed nearly all individuals could be exposed for up to one hour without irreversible or serious health effects. The ERPG-2 for ammonia is 200 ppm. EPA has adopted the ERPG-2 as the toxic endpoint for ammonia for the offsite consequence analysis required by the Risk Management Program (RMP) Rule under section 112(r) of the Clean Air Act.

In refrigeration systems, ammonia is liquefied under pressure. Liquid ammonia that is accidentally released may aerosolize (i.e., small liquid droplets may be released along with ammonia gas) and behave as a dense gas, even though it is normally lighter than air (i.e., it may travel along the ground instead of immediately rising into the air). This behavior may increase the potential for exposure of workers and the public.

Although pure ammonia vapors are not flammable at concentrations of less than 16%, they may be a fire and explosion hazard at concentrations between 16 and 25%. Mixtures involving ammonia contaminated with lubricating oil from the system, however, may have a much broader explosive range. A study conducted to determine the influence of oil on the flammability limits of ammonia found that oil reduced the lower flammability limit as low as 8%, depending on the type and concentration of oil (Fenton, et al., 1995).

An important property of ammonia is its pungent odor. Odor threshold varies with the individual but ammonia can be usually detected at concentrations in the range of about 5 ppm to 50 ppm. Concentrations above about 100 ppm are uncomfortable to most people; concentrations in the range of 300 to 500 ppm will cause people to leave the area immediately.

HAZARD REDUCTION

The Chemical Accident Prevention Group of EPA's Region III (Pennsylvania/ Maryland, Virginia, West Virginia, Delaware, and the District of Columbia) has been evaluating facilities in Region III with ammonia refrigeration systems to gather information on safety practices and technologies and to share its knowledge with these facilities.

Region Ill has conducted more than 120 audits from 1995 to the present of both large and small facilities using ammonia for refrigeration. To share their findings from the audits, including both the deficiencies observed and the actions that facilities are taking to increase safety, Region ill has made presentations to the Refrigerating Engineers and Technicians Association (RETA). This Alert is intended to communicate these findings to a wider audience.

Ammonia refrigeration facilities should be aware of the potential hazards of ammonia releases and of the steps that can be taken to prevent such releases. They should be prepared to respond appropriately if releases do occur. Here are steps that ammonia refrigeration facilities could take to prevent releases and reduce the severity of releases that do occur include:

- Establish training programs to ensure that the ammonia refrigeration system is operated and maintained by knowledgeable personnel.
- Consider using a spring-loaded ball valve (dead-man valve) in conjunction with the oil drain valve on all oil out pots (used to collect oil that leaks through seals) as an" emergency stop valve."
- Develop written standard operating procedures for removing oil from the oil out pots.
- Consider developing an in-house checklist to guide mechanics through the procedure.
- Remove refrigeration oil from the refrigeration system on a regular basis. Never remove oil directly from the refrigeration system without pumping down and properly isolating that component.
- Provide barriers to protect refrigeration equipment, i.e., lines, valves, and refrigeration coils, from impact in areas where forklifts are used. Consider starting a forklift driver training program.
- Develop and maintain a written preventive maintenance program and schedule·based on the manufacturer's recommendations for all of the refrigeration equipment The preventive maintenance program should include, but not be limited to:
  - a) compressors
  - b) pumps
  - c) evaporators
  - d) condensers
  - e) control valves
  - f) all electrical safety(s), including
    1) high pressure cutouts
    2) high temperature cutouts
    3) low pressure cutouts
    4) low temperature cutouts
    5) low oil pressure cutouts
  - g) ammonia detectors
  - h) emergency response equipment, including,
    1) air monitoring equipment
    2) self-contained breathing apparatus (SCBA)
    3) level A suit
    4) air- purifying respirators
- Perform vibration testing on compressors. Document and analyze results for trends.
- Maintain a leak-free ammonia refrigeration system. Investigate all reports of an ammonia odor and repair all leaks immediately. Leak test all piping, valves, seals, flanges, etc., at least four times a year. Some methods

which can be used for leak testing are sulfur sticks, litmus paper, or a portable monitor equipped with a flexible probe.

- Consider installing ammonia detectors in areas where a substantial leak could occur or if the facility is not manned 24 hours/ day. The ammonia detectors should be monitored by a local alarm company or tied into a call-down system. Ensure that the ammonia detectors are calibrated regularly against a known standard. Check the operation of ammonia sensors and alarms regularly.
- Replace pressure relief valves (PRV s) on a five-year schedule; document replacement dates by stamping the replacement date onto each unit's tag.
- Replace single PRVs with dual relief valves. A dual relief valve installation consists of one three-way dual shut-off valve with two pressure safety relief valves.
- For large systems with many PRVs, consider using an arrangement which includes installation of a rupture disc upstream of each
- PRV with a gauge port or transducer in between the disc and PRV and installation of an ammonia sensor in the PRV common manifold. In case of leakage from a PRV, the sensor would set off an alarm. A check of either the pressure gauge or transducer signal would permit easy identification of which PRV has popped.
- Consider installing a low water level probe with an alarm in the water sump for the evaporative condenser(s) to warn of water supply failure.
- Ensure that the ammonia refrigeration system is routinely monitored. Consider using a daily engine room log, recording process parameters (e.g., temperature and pressure levels) and reviewing the log on a regular basis. Consider having the chief engineer and the refrigeration technician sign the daily engine room log. In designing new systems or retrofitting existing systems, consider the use of-computer controls to monitor the process parameters.
- Keep an accurate record of the amount of ammonia that is purchased for the initial charge to the refrigeration system(s) and the amount that is replaced. Consider keeping a record of the amount of lubricating oil added to the system and removed from the system.
- Ensure that good housekeeping procedures are followed in the compressor rooms.
- Ensure that refrigeration system lines and valves are adequately identified (e.g., by color coding or labeling) by using an in-house system.
- Properly post ammonia placards (i.e. NFPA 704 NH3 diamond) and warning signs in areas where ammonia is being used as a refrigerant or being stored (for example, compressor room doors). Properly identify the chemicals within the piping system(s); label all process piping, i.e., piping containing ammonia, as “AMMONIA." Label must use black letters with yellow background. (This requirement is not the same as the in-house color coding system.)
- Periodically inspect all ammonia refrigeration piping for failed insulation/vapor barrier, rust, and corrosion. Inspect any ammonia refrigeration piping underneath any failed insulation systems for rust and corrosion. Replace all deteriorated refrigeration piping as needed. Protect all un-insulated refrigeration piping from rust-and/or corrosion by cleaning, priming, and painting with an appropriate coating.
- Carry out regular inspections of emergency equipment and keep respirators, including air-purifying and self-contained breathing apparatus (SCBA), and other equipment in good shape; ensure that personnel are trained in proper use of this equipment. For SCBA, it is important to ensure that air is bone dry. For air-purifying respirators, replace cartridges as needed and check expiration dates.
- Consider using the compressor room ammonia detector to control the ventilation fans.
- Identify the king valve and other emergency isolation valves with a large placard so that they can easily be identified by emergency responders, in case of an emergency. These valves should be clearly indicated on the piping and instrumentation diagrams (P&IDs) and/or process flow diagrams.
- Establish emergency shutdown procedures and instructions on what to do during and after a power failure.
- Establish written emergency procedures and instructions on what to do in the event of an ammonia release.
- Mount a compressor room ventilation fan manual switch outside of the compressor room and identify it with a placard for use in an emergency. Good practice would be to have ventilation switches located outside and inside of each door to the compressor room.
- Mount windsocks in appropriate places and incorporate their use into the facility emergency response plan. In addition to the emergency response plan, consider developing additional materials (posters, signs, etc.) to provide useful information to employees and emergency responders in case of an emergency.
- Keep piping and instrumentation diagrams (P&IDs), process flow diagrams, ladder diagrams, or single lines up-to-date and incorporate them into training programs for operators.
- Stage a realistic emergency response spill exercise with the local fire company.

References

Fenton, D.L., KS. Chapman, R.D. Kelley, and A.S. Khan. 1995. Operating Characteristics of a flare/oxidizer for the disposal of ammonia from and industrial refrigeration facility. ASHRAE Transactions, 101 (2), pp. 463-475. Atlanta, GA: American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

INFORMATION RESOURCES

General References

The Alaska DEC fact sheet on preventing accidental releases of anhydrous ammonia.

CEPPO has prepared a general advisory on ammonia (OSWER 91-008.2 Series 8 No: 2), available at:- http://www.epa.gov/ceppo/acc-his-html

Statutes and Regulations

The following are a list of federal statutes and regulations related to process safety, accident prevention, emergency planning and release reporting.

EPA

Clean Air Act (CAA)

- General Duty Clause [Section 112(r) of the Act] -- Facilities have a general duty to prevent and mitigate accidental releases of extremely hazardous substances, including ammonia.
- Risk Management Program (RMP) Rule [40 CFR 68] -- Facilities that have anhydrous ammonia in quantities greater than 10,000 pounds are required to develop a hazard assessment, a prevention program, and an emergency response program. EPA has developed a model guidance to assist ammonia refrigeration facilities comply with the RMP rule.

Emergency Planning and Community Right-to-Know (EPCRA)

- Emergency Planning [40 CFR Part 355] -- Facilities that have ammonia at or above 500 pounds must report to their LEPC and SERC and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355] -- Facilities that release 100 pounds or more of ammonia must immediately report the release to the LEPC and the SERC.
- Hazardous Chemical Reporting [40 CFR Part 370] -- Facilities that have ammonia at or above 500 pounds must submit a MSDS to their LEPC, SERC, and local fire department and comply with the Tier II Tier II inventory reporting requirements.
- Toxic Chemicals Release Inventory [40 CFR Part 372]: Manufacturing businesses with ten or more employees that manufacture, process, or otherwise use ammonia above an applicable threshold must file annually a Toxic Chemical Release form with EPA and the state.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- Hazardous Substance Release Reporting [40 CFR Part 302] -- Facilities must report to the National Response Center (NRC) any environmental release of ammonia which exceeds 100 pounds. A release may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

OSHA

- Process Safety Management (PSM) Standard [29 CFR 1910] Ammonia (anhydrous) is listed as a highly hazardous substance. Facilities that have ammonia in quantities at or above the threshold quantity of 10,000 pounds are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.
- Hazard Communication [29 CFR 1910.1200] -- Requires that the potential hazards of toxic and hazardous chemicals be evaluated and that employers transmit this information to their employees.

Codes and Standards

There are a number of American National Standards Institute (ANSI) Standards available for refrigeration systems. Some examples are given below.

ANSJ/ASHRAE Standard 15-1994 -- Safety Code for Mechanical Refrigeration

Available for purchase from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) International Headquarters

ANSI/IIAR 2-1992 -- Equipment, Design, and Installation of Ammonia Mechanical Refrigeration Systems -- Available from the International Institute of Ammonia Refrigeration (IIAR)

ISO 5149-1993 -- Mechanical Refrigerating Systems Used for Cooling and Heating -- Safety Requirements

HOME

HAZARDS OF AMMONIA RELEASES AT AMMONIA REFRIGERATION FACILITIES -- UPDATE

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. We are striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required.

EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon the circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Problem

Anhydrous ammonia is used as a refrigerant in mechanical compression systems at a large number of industrial facilities. Ammonia is a toxic gas under ambient conditions. Many parts of a refrigeration system contain ammonia liquefied under pressure. Releases of ammonia have the potential for harmful effects on workers and the public.

If the ammonia is under pressure, risk of exposure increases since larger quantities of the refrigerant have the potential for rapid release into the air. Also, some explosions have been attributed to releases of ammonia contaminated with lubricating oil. This Alert further discusses these potential hazards and the steps that can be taken to minimize risks. This Alert should be reviewed by personnel who operate and maintain refrigeration systems, managers of facilities, and emergency responders (e.g., hazmat teams).

Accidents

A number of accidental releases of ammonia have occurred from refrigeration facilities in the past. Releases result from a number of situations that include plant upsets leading to over pressure conditions and lifting of pressure relief valves; seal leaks from rotating shafts and valve stems; refrigerant piping failures due to loss of mechanical integrity from corrosion; physical damage of system components from equipment collisions; hydraulic shock; and hose failures that occur during ammonia deliveries. Some of these incidents have led to injury and fatalities on-site as well as causing adverse off-site consequences.

In addition to risks of personal injury, ammonia releases have the potential of causing significant collateral damage including: product loss due to ammonia contamination, interruption of refrigeration capacity, product loss due to refrigeration interruption, and potential for equipment and property damage resulting from the incident. In many cases, ammonia releases have resulted in multi-million dollar financial losses. The Factory Mutual Loss Prevention Data Bulletin 12-61 describes several incidents with property damage ranging from $100,000 to $1,000,000 per incident. The following describes several recent incidents in more detail.

One type of accident that is easily preventable is equipment failure due to physical impact. In a 1992 incident at a meat packing plant, a forklift struck and ruptured a pipe carrying ammonia for refrigeration. Workers were evacuated when the leak was detected. A short time later, an explosion occurred that caused extensive damage, including large holes in two sides of the building. The forklift was believed to be the source of ignition. In this incident, physical barriers would have provided mechanical protection to the refrigeration system and prevented a release.

Another incident highlights the need for an adequate preventive maintenance program and scheduling. In a 1996 incident involving a cold storage warehouse facility, compressor oil pressure progressively dropped during a long weekend. The low oil pressure cutout switch failed to shutdown the compressor leading to a catastrophic failure as the compressor tore itself apart. A significant release of ammonia ensued. Periodically testing all refrigeration-related safety cutout switches is absolutely necessary to minimize the likelihood of such incidents.

Two other incidents illustrate the potential for serious effects from accidental releases from ammonia refrigeration systems, although the causes of these releases were not reported. In a 1986 incident in a packing plant slaughterhouse, a refrigeration line ruptured, releasing ammonia. Eight workers were critically injured, suffering respiratory burns from ammonia inhalation, and 17 others were less severely hurt. A 1989 ammonia release in a frozen pizza plant led to the evacuation of nearly all of the 6,500 residents of the town where the plant was located. The release started when an end cap of a 16-inch suction line of the ammonia refrigeration system was knocked off. Up to 45,000 pounds of ammonia was released, forming a cloud 24 city blocks long. About 50 area residents were taken to hospitals, where they were treated with oxygen and released, while dozens of others were treated with oxygen at evacuation centers.

Hazard Awareness

Ammonia is used widely and in large quantities for a variety of purposes. More than 80% of ammonia produced is used for agricultural purposes; less than two percent is used for refrigeration. Ammonia can safely be used as a refrigerant provided the system is properly designed, constructed, operated, and maintained. It is important to recognize, however, that ammonia is toxic and can be a hazard to human health. It may be harmful if inhaled at high concentrations. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) is 50 parts per million (ppm), 8-hour time-weighted average.

Effects of inhalation of ammonia range from irritation to severe respiratory injuries, with possible fatality at higher concentrations. The National Institute of Occupational Safety and Health (NIOSH) has established an Immediately Dangerous to Life and Health (IDLH) level of 300 ppm for the purposes of respirator selection. Ammonia is corrosive and exposure will result in a chemical-type burn. Since ammonia is extremely hygroscopic, it readily migrates to moist areas of the body such as eyes, nose, throat, and moist skin areas. Exposure to liquid ammonia will also result in frostbite since its temperature at atmospheric pressure is –28F.

The American Industrial Hygiene Association (AIHA) has developed Emergency Response Planning Guidelines (ERPGs) for a number of substances to assist in planning for catastrophic releases to the community. The ERPG-2 represents the concentration below which it is believed nearly all individuals could be exposed for up to one hour without irreversible or serious health effects. The ERPG-2 for ammonia is 200 ppm. EPA has adopted the ERPG-2 as the toxic endpoint for ammonia for the offsite consequence analysis required by the Risk Management Program (RMP) Rule under section 112(r) of the Clean Air Act.

In refrigeration systems, ammonia is liquefied under pressure. Any liquid ammonia released to the atmosphere will aerosolize producing a mixture of liquid and vapor at a temperature of –28ºF. The released ammonia rapidly absorbs moisture in the air and forms a dense, visible white cloud of ammonium hydroxide. The dense mixture tends to travel along the ground rather than rapidly rising. This behavior may increase the potential for exposure of workers and the public.

Although pure ammonia vapors are not flammable at concentrations of less than 16%, they may be a fire and explosion hazard at concentrations between 16 and 25%. Mixtures involving ammonia contaminated with lubricating oil from the system, however, may have a much broader explosive range. A study conducted to determine the influence of oil on the flammability limits of ammonia found that oil reduced the lower flammability limit as low as 8%, depending on the type and concentration of oil (Fenton, et al., 1995).

An important property of ammonia is its pungent odor. The threshold concentration at which ammonia is detectable varies from person to person; however, ammonia can be usually detected at concentrations in the range of 5 ppm to 50 ppm. Concentrations above about 100 ppm are uncomfortable to most people; concentrations in the range of 300 to 500 ppm will cause people to leave the area immediately.

Hazard Reduction

The Chemical Accident Prevention Group of EPA's Region III (Pennsylvania, Maryland, Virginia, West Virginia, Delaware, and the District of Columbia) has been evaluating facilities in Region III with ammonia refrigeration systems to gather information on safety practices and technologies and to share its knowledge with these facilities. Region III has conducted more than 135 chemical safety audits from 1995 to the present of both large and small facilities using ammonia for refrigeration. In addition, over the past 2 years, Region III has conducted 32 Risk Management Program (RMP) audits of ammonia refrigeration systems to ensure compliance with the RMP rule and 17 General Duty Clause inspections of systems that are not covered by the RMP regulation but had a near miss incident. (A brief explanation of the General Duty Clause and the RMP Rule is found in the Statutes and Regulations Section of this Alert).

To share their findings from the audits, including both the deficiencies observed and the actions that facilities are taking to increase safety, Region III has made presentations to the Refrigerating Engineers and Technicians Association (RETA). This Alert is intended to communicate these findings to a wider audience.

Ammonia refrigeration facilities should be aware of the potential hazards of ammonia releases and of the steps that can be taken to prevent such releases. They should be prepared to respond appropriately if releases do occur. Here are steps that ammonia refrigeration facilities could take to prevent releases and reduce the severity of releases that do occur:

- Establish training programs to ensure that the ammonia refrigeration system is operated and maintained by knowledgeable personnel. Some organizations that provide ammonia refrigeration education and training are listed in the Training Resources Section of this Alert.
- Consider using a spring-loaded ball valve (dead-man valve) in conjunction with the oil drain valve on all oil out pots (used to collect oil that migrates into system components) as an emergency stop valve.
- Develop and require refrigeration maintenance personnel to follow written, standard procedures for

maintaining the system including such routine procedures as oil draining. Consider developing in-house checklists to guide maintenance personnel while they execute these procedures.

- Remove refrigeration oil from the refrigeration system on a regular basis. Never remove oil directly from the refrigeration system without pumping down and properly isolating that component.
- Provide barriers to protect refrigeration equipment, i.e., lines, valves, and refrigeration coils, from impact in areas where forklifts are used. Consider integrating ammonia refrigeration awareness and discussion of the risks of forklift accidents that can lead to ammonia releases as part of a formal forklift driver training program.
- Develop and maintain a written preventive maintenance program and schedule based on the manufacturers recommendations for all of the refrigeration equipment. The preventive maintenance program should include, but not be limited to:
  a) compressors
  b) pumps
  c) evaporators
  d) condensers
  e) control valves
  f) all electrical safety(s), including
     1) high pressure cutouts
     2) high temperature cutouts
     3) low pressure cutouts
     4) low temperature cutouts
     5) low oil pressure cutouts
     6) automatic purge systems
  g) ammonia detectors
  h) emergency response equipment, including,
     1) air monitoring equipment
     2) self-contained breathing apparatus (SCBA)
     3) level A suit
     4) air-purifying respirators.
- Perform regular vibration testing on compressors. Document and analyze results for trends.
- Maintain a leak-free ammonia refrigeration system. Investigate all reports of an ammonia odor and repair all leaks immediately. Leak test all piping, valves, seals, flanges, etc., at least four times a year. Some methods which can be used for leak testing are sulfur sticks, litmus paper, or a portable monitor equipped with a flexible probe.
- Consider installing ammonia detectors in areas where a substantial leak could occur or if the facility is not manned 24 hours/day. The ammonia detectors should be monitored by a local alarm company or tied into a call-down system. Ensure that the ammonia detectors are calibrated regularly against a known standard. Check the operation of ammonia sensors and alarms regularly.
- Replace pressure relief valves (PRVs) on a regular schedule (consult ANSI/IIAR Standard 2– Equipment, Design, and Installation of Ammonia Mechanical Refrigerating Systems); document replacement dates by stamping the replacement date onto each unit's tag.
- Replace single PRVs with dual relief valve installations. A dual relief valve installation consists of one three-way shut-off valve with two pressure safety relief valves. The required use of dual relief valves (based on the size of the vessel to be protected) is outlined in ASHRAE Standard 15 – Safety Code for Mechanical Refrigeration. Consider how the use of dual relief valve installations may facilitate the replacement, servicing, or testing of PRVs on a regular schedule – a three-way valve allows one PRV to be isolated while the other remains on-line to protect the vessel. This setup allows each PRV to be serviced, tested or replaced on a regular basis without the need to pump down the system.
- For large systems with many PRVs, consider using an for detecting leakage. This arrangement includes installation of a rupture disc upstream of each PRV with a gauge port or transducer in between the disc and PRV and installation of an ammonia sensor in the PRV common manifold. In case of leakage from a PRV, the sensor would set off an alarm. A check of either the pressure gauge or transducer signal would permit easy identification of which PRV has popped.
- Ensure that the ammonia refrigeration system is routinely monitored. Consider using a daily engine room log, recording process parameters (e.g., temperature and pressure levels) and reviewing the log on a regular basis. Consider having the chief engineer and the refrigeration technician sign the daily engine room log. In designing new systems or retrofitting existing systems, consider the use of computer controls to monitor the process parameters.
- Keep an accurate record of the amount of ammonia that is purchased for the initial charge to the refrigeration system(s) and the amount that is replaced. Consider keeping a record of the amount of lubricating oil added to the system and removed from the system.
- Ensure that good housekeeping procedures are followed in the compressor/recycle rooms. Ensure that refrigeration system lines and valves are adequately identified (e.g., by color coding or labeling) by using an in-house system.
- Establish emergency shutdown procedures and instructions on what to do during and after a power failure. Consider installing a solenoid valve in the king valve line operated by a switch located outside of the compressor/recycle room.
- Properly post ammonia placards (i.e. NFPA 704 NH_3 diamond) and warning signs in areas where ammonia is being used as a refrigerant or being stored (for example, compressor room doors). Properly identify the chemicals within the piping system(s); label all process piping, i.e. piping containing ammonia, as "AMMONIA." Label must use black letters with yellow background. (This

requirement is not the same as the in-house color coding system.)

- Periodically inspect all ammonia refrigeration piping for failed insulation/ vapor barrier, rust, and corrosion. Inspect any ammonia refrigeration piping underneath any failed insulation systems for rust and corrosion. Replace all deteriorated refrigeration piping as needed. Protect all un-insulated refrigeration piping from rust and/or corrosion by cleaning, priming, and painting with an appropriate coating.
- Carry out regular inspections of emergency equipment and keep respirators, including air-purifying and self-contained breathing apparatus (SCBA), and other equipment in good shape; ensure that personnel are trained in proper use of this equipment. For SCBA, it is important to ensure that air is bone dry. For air-purifying respirators, replace cartridges as needed and check expiration dates.
- Consider using the compressor room ammonia detector to control the ventilation fans.
- Identify the king valve and other emergency isolation valves with a large placard so that they can easily be identified by emergency responders, in case of an emergency. These valves should be clearly indicated on the piping and instrumentation diagrams (P&IDs) and/or process flow diagrams.
- Establish written emergency procedures and instructions on what to do in the event of an ammonia release.
- Regularly conduct emergency response drills. Emergency response personnel should "suitup" as part of the drill process. As needed, members of the hazmat team should regularly suit-up to sharpen their emergency response skills.
- Stage a realistic emergency response spill exercise with the local fire company.
- Mount a compressor room ventilation fan manual switch outside of the compressor room and identify it with a placard for use in an emergency. Good practice would be to have ventilation switches located outside and inside of each door to the compressor room.
- Mount windsocks in appropriate places and incorporate their use into the facility emergency response plan. In addition to the emergency response plan, consider developing additional materials (posters, signs, etc.) to provide useful information to employees and emergency responders in case of an emergency. In developing emergency information, consider whether materials should be developed in languages other than English.
- Keep piping and instrumentation diagrams (P&IDs), process flow diagrams, ladder diagrams, or single lines up-to-date and incorporate them into training programs for operators. A good suggestion is to laminate the P&ID and ladder diagrams and post nearby to the equipment.
- Frost accumulates on evaporator coils. The evaporator can be "soft gassed" during the defrost cycle by placing a smaller hot gas solenoid valve in parallel with the main hot gas solenoid valve. The smaller valve is sequenced to open first; thereby, allowing the evaporator pressure to rise slowly. An alternative approach is to use a motorized full port ball valve in the hot gas supply line and open it slowly initially to accomplish the soft gassing. Once the pressure in the evaporator is brought up, then fully open the valve. For additional information, consult IIAR's Ammonia Refrigeration Piping Handbook.

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IIAR. 2000. Ammonia Refrigeration Piping Handbook

Education and Training Resources

Garden City Community College: offers hands-on training oriented toward operators of industrial ammonia refrigeration systems and PSM/RMP implementation classes. Garden City, Kansas

Industrial Refrigeration Consortium (IRC) at the University of Wisconsin-Madison: this university-industry partnership offers educational opportunities and refrigeration-related resources.

International Institute of Ammonia Refrigeration (IIAR): offers ammonia refrigeration-related educational videos, short course, and an annual conference.

Refrigeration Engineers Technicians Association: offers self-study materials and a tiered certification/evaluation program for refrigeration technicians/mechanics.

Information Resources

General References

OSHA has a web site with information on ammonia refrigeration and process safety: www.slc.oshaslc.gov/SLTC/ammoniarefrigeration/index.html

CEPPO has prepared a general advisory on ammonia (OSWER 91-008.2 Series 8 No. 2), available at: www.epa.gov/ceppo/acc-his.html.

Industrial Refrigeration Consortium (IRC) Headquartered at the University of Wisconsin-Madison, the IRC is a university-industry partnership aimed at improving safety, efficiency, and productivity of industrial refrigeration systems and technologies. The IRC conducts applied research, offers refrigeration training, and provides technical assistance to refrigeration end-users. The IRC maintains a website with additional information and resources related to ammonia refrigeration at: www.irc.wisc.edu.

Statutes and Regulations

The following are a list of federal statutes and regulations related to process safety, accident prevention, emergency planning, and release reporting.

EPA

Clean Air Act (CAA)

- General Duty Clause [Section 112(r) of the Act]-- Facilities have a general duty to prevent and mitigate accidental releases of extremely hazardous substances, including ammonia.
- Risk Management Program (RMP) Rule [40 CFR 68]- Facilities that have anhydrous ammonia in quantities greater than 10,000 pounds are required to develop a hazard assessment, a prevention program, and an emergency response program. EPA has developed a model guidance to assist ammonia refrigeration facilities comply with the RMP rule.

Emergency Planning and Community Right-to-Know Act (EPCRA)

- Emergency Planning [40 CFR Part 355] -- Facilities that have ammonia at or above 500 pounds must report to their LEPC and SERC and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355] -- Facilities that release 100 pounds or more of ammonia must immediately report the release to the LEPC and the SERC.
- Hazardous Chemical Reporting [40 CFR Part 370] -- Facilities that have ammonia at or above 500 pounds must submit a MSDS to their LEPC, SERC, and local fire department and comply with the Tier I/ Tier II inventory reporting requirements.
- Toxic Chemicals Release Inventory [40 CFR Part 372] - Manufacturing businesses with ten or more employees that manufacture, process, or otherwise use ammonia above an applicable threshold must file annually a Toxic Chemical Release form with EPA and the state.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- Hazardous Substance Release Reporting [40 CFR Part 302]- Facilities must report to the National Response Center (NRC) any environmental release of ammonia which exceeds 100 pounds. A release may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

OSHA

- Process Safety Management (PSM) Standard [29 CFR 1910] Ammonia (anhydrous) is listed as a highly hazardous substance. Facilities that have ammonia in quantities at or above the threshold quantity of 10,000 pounds are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.
- Hazard Communication [29 CFR 1910.1200] -Requires that the potential hazards of toxic and hazardous chemicals be evaluated and that employers transmit this information to their employees.

Codes and Standards

There are a number of American National Standards Institute (ANSI) Standards available for refrigeration systems. Some examples are given below.

- ANSI/ASHRAE Standard 15-1994 - Safety Code for Mechanical Refrigeration
- ANSI/IIAR 2-1992 - Equipment, Design, and Installation of Ammonia Mechanical Refrigeration Systems

HOME

HOW TO PREVENT RUNAWAY REACTIONS: Case Study: Phenol-Formaldehyde Reaction Hazards

EPA is issuing this Case Study as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. Under CERCLA, section 104(e) and the Clean Air Act (CAA), EPA has authority to conduct chemical accident investigations. EPA is striving to learn the causes and contributing factors associated with chemical accidents to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements, but by understanding the fundamental root causes, widely disseminating the lessons learned, and integrating them into safe operations.

EPA will publish Case Studies and Alerts to increase awareness of possible hazards. It is important that facilities, State Emergency Response commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Many industrial chemical processes involve exothermic (heat generating) reactions. Uncontrolled, or runaway, reactions can occur as a result of various situations, such as mischarged raw materials, failure of a reactor's cooling system or the presence of contaminants. If the heat generation exceeds the reactor's ability to remove it, the reaction can accelerate -- or run away -- and cause the temperature and pressure to increase. A sudden energy release from such an uncontrolled reaction has the potential to harm workers, the public, and the environment. The following Case Study aims to increase awareness of possible hazards connected with exothermic reactions.

Columbus, Ohio Sept. 10, 1997

At approximately 10:42 a.m. on Wednesday, Sept. 10, 1997, an explosion occurred in a resins production unit at Georgia-Pacific Resins, Inc. in Columbus, Ohio. The blast was reported to be felt at least 2 miles and possibly as far as 7 miles away according to various news accounts and other reports. As a result of the explosion, one worker was killed and four others injured. The explosion extensively damaged the plant. Local news reported that a vocational school and several homes and businesses within a 3/4-mile radius were evacuated as a precaution by the local fire department for several hours (Dispatch, September 11, 1997). The explosion also resulted in the release of a large quantity of liquid resin and smaller quantities of other chemicals within the facility. Three fire fighters were injured during the response, treated for first-degree chemical burns, and released.

Accident Investigation

Under a 1997 Memorandum of Understanding (MOU) to investigate chemical accidents and report on the lessons learned, EPA and the Occupational Safety and Health Administration (OSHA) collaborated to analyze the evidence. The purpose of this effort was to understand the circumstances associated with the accident to prevent a recurrence at this and other facilities.

Phenol-formaldehyde reactions are common industrial processes. The reaction of phenol or substituted phenol with an aldehyde, such as formaldehyde, in the presence of an acidic or basic catalyst is used to prepare phenolic resins. Phenolic resins are used in adhesives, coatings, and molding compounds. The type of catalyst used, the ratio of reactants, and the reaction conditions determine the molecular structure and physical properties of the resin produced. Typically, phenol-formaldehyde reactions are highly exothermic and sensitive to a variety of physical and chemical conditions. Once a reaction is initiated, heat generated by the reaction increases the reaction rate generating more heat.

Because the reaction rate is typically an exponential function of temperature, the rate of heat generation will accelerate. Without intervention, a thermal runaway will occur, producing a large amount of heat in a very short time. Once the reaction begins to accelerate, the pressure of the system will typically increase suddenly due to gas production and/or the vigorous evaporation of liquid. If the reaction continues to accelerate, the pressure buildup may reach and exceed the ultimate strength of the reactor and cause it to explode. Typically, phenolic resin batch processes are equipped with an agitator, heating/cooling jacket, a water-cooled condenser, and a vacuum system (Kirk-Othmer, p.614). The heat of reaction is removed by the evaporation of water or other liquid from the process, condensation of the liquid in the overhead condensation system, and return of the liquid to the reactor vessel. Emergency relief on the reactor is usually provided by rupture disks. In a conventional novalak process, molten phenol is placed into the reactor, followed by a precise amount of acid catalyst. The formaldehyde solution is then added. For safety reasons, slow continuous or stepwise addition of formaldehyde is preferred over adding the entire charge at once (Kirk-Othmer, p. 614).

The manufacture of phenolic resins has resulted in a number of accidents dating back to 1957. A search of accident databases and the literature reveals that numerous incidents have resulted in worker fatalities and injuries and significant property damage. Table 1 is a summary of the incidents that have occurred during the past 10 years.

Georgia-Pacific was manufacturing a phenolic resin in an 8,000-gallon batch reactor when the incident occurred. An operator charged raw materials and catalyst to the reactor and turned on steam to heat the contents. A high temperature alarm sounded and the operator turned off the steam. Shortly after, there was a large, highly energetic explosion that separated the top of the reactor from the shell. The top landed 400 feet away. The shell of the reactor split and unrolled, and impacted against other vessels. A nearby holding tank was destroyed and another reactor was partially damaged. The explosion killed the operator and left four other workers injured. The investigation revealed that the reactor explosion was caused by excessive pressure generated by a runaway reaction. The runaway was triggered when, contrary to standard operating procedures, all the raw materials and catalyst were charged to the reactor at once followed by the addition of heat. Under the runaway conditions, heat generated exceeded the cooling capacity of the system and the pressure generated could not be vented through the emergency relief system causing the reactor to explode.

Table 1 Phenol-Formaldehyde Reaction Incidents at Various Companies

Date of incident	**ST**	**Description**	**Effects**
September 10, 1997	OH	A 8,000 gallon reactor exploded during production of a phenol-formaldehyde resin.	1 worker fatality, 4 employees injured, 3 firefighters treated for chemical burns. Evacuation of residents for several hours.
August 18, 1994	OH	Pressure buildup during manufacture of phenolic resin, pressure increased, rupture disks popped. Product was released through emergency vent. The cause of accident was reported as failure to open condensate return line.	Residents evacuated for 5 hours.
February 29, 1992	GA	A 13,000 gallon reactor exploded during production of a phenol-formaldehyde resin. Explosion occurred during initial stages of catalyst addition.	4 employees injured, 1 seriously. 1 firefighter treated for chemical burns. Evacuation of 200 residents for 3 hours.
November 11, 1991	OH	Temperature increased in chemical reactor, releasing phenol formaldehyde resin.	None reported.
October 16, 1989	WI	Manufacture of phenolic resins and thermoset plastics; release of phenol and formaldehyde from process vessel.	None reported.
August 28, 1989	NY	Manufacture of phenolic resins; release of phenol and phenolic resin from process vessel; “operator error” cited as cause.	1 injured.
July 25, 1989	VA	Specialty paper manufacturing; release of phenolic resin and methanol from process vessel.	None reported.

Lessons Learned

Controlling an exothermic reaction depends on the interaction among the kinetics and reaction chemistry; the plant equipment design; and the operating environment. Facilities must consider the following factors to better understand and address the potential hazards and consequences of reactive systems:

- **Thorough hazard assessment -**The chemical and process hazards and the consequences of deviations must be thoroughly understood, evaluated, documented, and appropriately addressed through preventive measures. The adequacy of safety systems to prevent deviations must be carefully evaluated, including consideration of worst case situations Several layers of safety systems, whether complementary or redundant should be considered to enhance reliability. One way that facilities can carry out this evaluation is to use formal process hazard analysis (PHA) techniques, such as what-if or fault tree analysis. The Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE) has prepared guidance on PHA methodologies. (See CCPS, 1992)
- **Complete identification of reaction chemistry and thermochemistry -** For some exothermic reactions, the time to runaway is very short. Over-pressurization can occur when gas or vapor is produced as a byproduct of the reaction or any decomposition reactions. The kinetics of the runaway reaction will be reaction specific and may differ in various runaway situations. While general studies found in the literature can be useful for screening thermal hazards, the characteristics of the particular reactions must be determined experimentally. Experimental data should be used to define process boundaries in terms of the pressure, temperature, concentration, and other parameters as well as the consequences of operating outside of these boundaries.
- **Administrative controls -** If administrative controls, such as training and standard operating procedures, are used

as a safeguard against process deviation and accidental release, consideration must be given to human factors to ensure reliability, especially if an administrative control is the sole layer of protection. Humans make mistakes; the consequences of a human error should not lead to a catastrophic release. Processes, equipment and procedures must be designed with potential for human error in mind. For manual operations, preventive measures should be considered to minimize the likelihood of human error, for example, interlocks. SOP's must be understandable, periodically reviewed, and kept up-to-date. Employees must be trained on the SOP's and mechanisms set up to ensure that SOP's are followed at all times. The consequences of deviation from SOP's must be well understood by all employees.

- **Temperature control -**The capability of the cooling system to remove the heat generated by the reaction is critical to the safe operation of an exothermic process. Facilities should evaluate capacity of cooling system with respect to controlling unexpected exotherms. Condensation cooling of reflux is commonly used to cool exothermic reactions that generate vapor as a byproduct, but has several limitations to control unexpected exotherms. Reflux cooling is limited until the reaction mass reaches the boiling point of the liquid and cannot control exotherms that begin while the reaction temperature is below the liquid's boiling point. As a runaway reaction proceeds, the increased generation rate of vapor increases the vapor velocity, the mass flow rate, and the inlet temperature in the overhead condenser. The increased heat load on the condenser results in only partial condensation and reflux of water.
- **Addition of raw materials** - Frequently, the reaction rate is controlled by the addition rate of one reactant or the catalyst and should be determined based on chemistry studies. Facilities must pay attention to the order of ingredients, the addition rates, under- or over-charging, and loss of agitation.
- **Emergency relief -** Runaway reactions may lead to the rapid generation of gas or water vapor. Under certain conditions, the vapor generation rate may be large enough to cause the vapor-liquid mixture to swell to the top of the vessel, resulting in two-phase flow in the relief venting system. Relief system capacity should be evaluated in conjunction with the hazard analysis to ensure that sizing is based on an appropriate worst case scenario.
- Learning from accident history and near misses - Very few accidents occur without any warning. As Table 1 shows, a search of readily available sources found a number of incidents involving phenol-formaldehyde reactions. Accident history should be included in the information evaluated as part of the process hazard analysis. Additionally, many accidents are preceded by one or more near-miss incidents. Near misses should be analyzed to determine if operating procedures or other items need change.

Steps To Reduce Hazards

The consequences of a runaway reaction can be severe. Therefore, facilities must focus on prevention of conditions favorable to a reaction excursion through process design control, instrumentation, and interlocks to prevent recurrence of similar events. Facilities should take the following steps to prevent runaway reactions:

- **Modify processes to improve inherent safety.** Consider inherently safer processes to reduce reliance on administrative controls. (See CCPS, 1996)
- **Minimize the potential for human error.** Anticipate possible human errors and carefully evaluate scenarios where an error could have catastrophic results. Managers should implement various protective measures, such as temperature control, instrumentation, and interlocks to eliminate opportunities for human error, especially in critical manual operations.
- **Understand events that may lead to an overpressure and eventually to vessel rupture.** Ensure that all chemical and process hazards and consequences are understood, evaluated, and appropriately addressed. Examine scenarios that include the failure of engineering and/or administrative controls. Evaluating these hazards may require detailed process hazard assessments. Use techniques and available information to minimize the chance of missing an important potential accident scenario.
- **Use lessons learned.** Go beyond issues of quality control and operator error and identify true root causes. Learn from near misses and similar incidents and foster an environment where any deviation, no matter how small, is raised and addressed. Identify root causes and recommend changes to prevent recurrence. Share your expertise with all facilities in the corporate structure and share your experience through regular participation in safety forums sponsored by trade associations or professional organizations.
- **Evaluate SOPs.** SOP's should include critical operating parameters and why they are important. Each numbered step in the SOP should include only one action. Evaluate SOP's and modify when necessary to minimize the likelihood of an undetected human error. Supervisors should audit SOPs regularly, including the direct observation of employees and conducting employee interviews to ensure the SOPs are fully understood. This information will help supervisors identify deviations from SOP's and will help supervisors recommend and ensure revision of SOPs.
- **Evaluate employee training and oversight**. Ensure that operators are adequately trained and supervised before assignment to critical manual operations. Be aware that

a limitation of on-the-job training is that trainees are prepared to handle only a limited number of problems, primarily those encountered before. To offset this limitation, trainees should work alongside an experienced operator and be supervised when using new procedures. Operator training can frequently be improved by showing operators how to respond to upset conditions or process deviations.

- **Evaluate measures to inhibit a runaway reaction**. A runaway reaction, if caught early, can sometimes be halted by adding chemicals to cancel the effect of the catalyst. Common measures include neutralization, quenching with water or other diluent, or dumping the contents into another vessel which contains a quench liquid. Carefully select the inhibitor or quench material, determine the appropriate concentration and rate of addition of inhibitor and understand the inhibition reaction.
- **Evaluate the effectiveness of the emergency relief system.** Proper vent sizing for potential runaway exothermic reactions is complex and requires data on the heat and pressure generation that may occur during a runaway. The most recent procedures used to calculate vent size were developed by the Design for Emergency Relief Systems (DIERS) program, a consortium of companies chartered by the American Institute of Chemical Engineers (AIChE). For certain reaction systems, the pressure rise due to a runaway may be so quick that the calculated vent size will be impractical and the only safety options are to prevent or inhibit a runaway reaction.

Related Statutes and Regulations

EPA

- General Duty Clause [Section 112(r) of the Clean Air Act (CAA)]- Facilities have a general duty to prevent and mitigate accidental releases of extremely hazardous substances.
- Risk Management Program (RMP) Rule [40 CFR 68]- Facilities with listed substances in quantities greater than the threshold planning quantity must develop a hazard assessment, a prevention program, and an emergency response program

OSHA

- Process Safety Management (PSM) Standard [29 CFR 1910.119] - Facilities with listed substances at or above the threshold planning quantity are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.

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LIGHTNING HAZARD TO FACILITIES HANDLING FLAMMABLE SUBSTANCES

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. Under CERCLA, section 104(e) and Clean Air Act (CAA), EPA has authority to conduct chemical accident investigations. Additionally, in January 1995, the Administration asked the Occupational Safety and Health Administration (OSHA) and EPA to jointly undertake investigations to determine the root cause(s) of chemical accidents and to issue public reports containing recommendations to prevent similar accidents. EPA has created a chemical accident investigation team to work jointly with OSHA in these efforts. Prior to the release of a full report,

EPA intends to publish Alerts as promptly as possible to increase awareness of possible hazards. Alerts may also be issued when EPA becomes aware of a significant hazard. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Lightning strikes that hit equipment and storage or process vessels containing flammable materials can cause devastating accidents at refineries, bulk plants, processing sites, and other facilities. This alert is designed to raise awareness so industry can take proper precautions.

RECENT ACCIDENTS

In recent years, several accidents have occurred where lightning has struck facilities handling flammable substances, resulting in explosions and fires.

In general, there was little or no information on the lightning protection used at these facilities, however, given what is currently known about lightning, these incidents may have been preventable.

In a 1996 incident, lightning struck a storage tank containing three to four million gallons of gasoline, causing a portion of the tank lid to shoot up and come down on its side into the tank.

The gasoline stored inside did not spill out, but there was a massive fire that burned for 28 hours before being put out by firefighters.

Firefighters sprayed water on 15-20 surrounding tanks to prevent another explosion; even so, the fire fatigued four nearby tanks. Although the explosion and fire caused no deaths or injuries, about 200 nearby residents had to be evacuated.

In a 1992 incident, lightning struck a fiberglass storage tank, setting off a series of explosions that released toxic fumes and spread thick smoke over town.

More than 1,000 people were evacuated, and there were minor injuries, including nausea, skin irritation, and shortness of breath.

In a 1977 incident, lightning struck a roof tank containing diesel fuel. Roof fragments struck and ignited two other gasoline tanks; the tanks and gasoline were destroyed. Property and cleanup costs were eight million dollars.

HAZARD AWARENESS

Lightning strikes cause more deaths, injuries, and damage than all other environmental elements combined, including hurricanes, tornadoes, and floods. The National Fire Protection Association (NFPA) estimates there were 26,400 lightning-caused fires annually between 1989 and 1992; property damage during this time was estimated to be in the billions of dollars. According to the Insurance Information Institute, five percent of all paid insurance claims were lightning-related.

While all types of facilities should evaluate their lightning safety, storage tanks containing flammable substances may represent a special fire or explosion hazard in the event of a lightning strike; a spark, that might otherwise cause little or no damage, could ignite flammable vapors, resulting in a fire or explosion. Releases of toxic substances also have occurred.

Lightning is a form of static electricity; it has extremely high electrical potentials and energy and can generate extremely high temperatures.

Lightning is a random, capricious event and not well understood. What is known is that lightning tends to strike the tallest object on the ground in the path of its discharge. Parts of structures most likely to be struck are those that project above surrounding parts, vents, edge of roof, wind sock, etc.

The bolt generally follows a conductive path to ground. Lightning may enter a structure by striking it directly, by striking a metallic object extending up and out from the structure, by striking a nearby tree or other tall object and moving horizontally to the structure, or by striking overhead wires and being conducted into the structure by power lines.

Lightning strikes vary in frequency depending on location. In general, according to the National Severe Storm Laboratory (NSSL), the U.S. mainland has a decreasing amount of lightning toward the northwest.

Over the entire year, the highest frequency of cloud-to-ground lightning is in Florida between Tampa and Orlando.

There are also high frequencies along the Gulf of Mexico coast westward to Texas, the western mountains, the Atlantic coast in the southeast, and inland from the Gulf. Regions along the Pacific west coast have the least cloud-to-ground lightning.

HAZARD REDUCTION

Proper lightning protection provides a controlled path for the current to follow back to earth and minimizes the development of hazardous potential differences. It may not be possible to completely eliminate the possibility of damaging accidents caused by lightning, a random phenomenon. However, steps can be taken to minimize them. Facilities should determine an adequate level and type of protection and then regularly maintain and inspect the protection systems.

A low impedance path (e.g., lightning rod to ground) should be offered to prevent the lightning current from taking other possible destructive routes. Most metals are good electrical conductors for low impedance paths and unaffected by electricity flow. This path must be a continuous path from the ground terminal to the air terminal (lightning rod). This requires that metal parts be interconnected or bonded so that they maintain the same electrical potential. This prevents side-flashes or sparks over disconnected metal parts. Potential gaps between metallic conductors should be avoided especially where flammable vapors may escape or accumulate.

For tanks holding flammable substances, protection devices, such as air terminals (lightning rods), bonding and appropriate grounding systems, conductors (connects air terminals to grounding system), masts, overhead ground wires, and other types of protection, should be considered.

The National Lightning Safety Institute (NLSI) recommends that connector bonding should be thermal, not mechanical, where possible. The NLSI also recommends frequent inspection and resistance measuring of mechanical connectors.

The configuration of the grounding system is important and depends upon soil conditions, building construction, and the presence of other underground conductors.

Grounding systems can be created with driven ground rods, plates, and perhaps a counterpoise (a buried cable encircling the site).

Materials adequate to withstand lightning strikes should be used; specifically, use of low impedance materials (e.g. metals) is essential. The grounding system should be designed for a target resistance of five ohms/meter resistance or less.

Testing, inspection, and electrical continuity measurement should be a part of maintenance. Grounding cables connected to tanks should not be painted over, corroded, or contain items such as dirt or bugs that will create a path for lightning other than to ground. When checking tanks, put the ohmmeter - the electrical resistance meter - from cable to tank and note high reading requires cleaning of the connections.

Some tanks used for storage of flammable substances may be self-protecting from damage from lightning and may need no additional protection; such tanks would include metallic structures that are electrically continuous, tightly sealed to prevent the escape of liquids, vapors, or gases, and of adequate thickness to withstand direct lightning strikes.

Besides starting fires, lightning can also disrupt control systems and electrical circuitry more than two miles away.

This can result in corrupted data, false signals, or immediate or delayed destruction of sensitive electronics that could cause an upset or release in your process.

Ordinary fuses and circuit breakers are not capable of dealing with lightning strikes. Surge protection for sensitive electronics (such as process-control circuitry and related PC boards, computers, and other equipment) should be used.

There are many types and manufacturers of surge-suppression equipment. The most cost-effective device should be carefully selected to handle the currents and voltages expected from a severe strike.

Surge suppressors should be installed where they can be inspected easily and replaced when damaged by a severe strike.

Several codes and standards for lightning protection may be consulted for specific guidance; examples of such standards are cited in the next section. Additional information also may be available from various organizations and publications.

INFORMATION RESOURCES ON LIGHTING PROTECTION

Some references that may contain information about the hazards of lightning resulting in explosions and methods of minimizing these hazards are listed below. Regulations potentially applicable to facilities, and codes and standards that may be relevant are also listed below. For more information consult the following:

Statutes and Regulations

- Section 112(r) of the Clean Air Act focuses on prevention of chemical accidents. It imposes on facilities with regulated substances or other extremely hazardous substances a general duty to prevent and mitigate accidental releases. Accident prevention activities include identifying hazards and operating a safe facility.
- EPA's Risk Management Program (RMP) Rule [40 CFR 68] is intended to prevent and mitigate accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program.
- The Occupational Safety and Health Administration (OSHA) has the Process Safety Management Standard, which includes regulations on fire prevention.

Codes and Standards

The American Petroleum Institute (API) has standards relevant to lightning protection at facilities. Relevant API standards include:

- API RP 2003 — Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents, fifth edition, 1991.
- API PUBL 2210 — Flame Arrestors for Vents of Tanks Storing Petroleum Products, second edition, 1982.

The National Fire Protection Association (NFPA) has lightning and flammable/combustible liquid codes. Relevant NFPA codes include:

- NFPA 30 — Flammable and Combustible Liquids Code, 1996.
- NFPA 70 — National Electric Code, 1996.
- NFPA 77 — Static Electricity, 1993.
- NFPA 780 — Lightning Protection Code, 1995.
- NFPA 921 — Guide for Fire and Explosion Investigations, 1995.
- NFPA 1600 — Disaster Management, 1995.

Underwriters Laboratories Inc. (UL) has standards for product safety. Relevant UL standards include:

- UL 96 - Lightning Protection Components, 1994.
- UL 96A -Installation Requirements for Lightning Protection Systems, 1994.
- UL 198G - Fuses for Supplementary Overcurrent Protection, 1988.
- UL 467 - Grounding and Bonding Equipment, 1993.
- UL 525 - Flame Arresters, 1993.
- UL 1077 - Supplementary Protectors for Use in Electrical Equipment, 1994.
- UL 1449 - Transient Voltage Surge Suppressors, 1996.

Organizations Dedicated to Lightning Issues

The Lightning Protection Institute (LPI) has endorsed official programs since the 1970s for the certification of properly installed lightning protection systems. Relevant LPI standards include:

- LPI-175 -Lightning Protection Systems Standard of Practice

The National Lightning Safety Institute's (NLSI) mission is to improve lightning safety through various activities including establishing specific audit and certification protocols, as well as engineering site survey programs.

A list of firms providing lightning protection technologies can be obtained locally, through the Internet by using the search terms "lightning and protection", and through LPI, NLSI, or the United Lightning Protection Association (ULPA).

PREVENTION OF REACTIVE CHEMICAL EXPLOSIONS: Case Study: Waste Fuel/Oxidizer Reaction Hazards

HOME

EPA is issuing this Case Study as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements; understanding the fundamental root causes of accidents, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA will publish Case Studies and Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot impose legally binding requirements on EPA, states, or the regulated community, and may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action, and may change in the future, as appropriate.

Problem

The mixing of organic fuels and oxidizers is generally recognized as inherently dangerous. Accident histories reveal many examples of fires and explosions triggered by improper mixing of these substances.

The incident described here is an example of the potential consequences associated with improper mixing of organic solvents and oxidizers. This Case Study is designed to raise awareness about the hazards associated with blending waste fuels and reactive chemicals and to offer recommendations to reduce the potential for accidents.

HASKELL, OKLAHOMA (MARCH 26, 1997)

On March 26, 1997, at about 3 p.m. an explosion occurred within a fuel blending tank at Chief Supply Corporation (Chief), in Haskell, Oklahoma. One worker was killed and two others injured.

The explosion and resulting fire caused extensive damage to the facility. Several smaller explosions occurred as over 1,000 drums containing waste paints, oils, thinners, inks, cleaning solvents, assorted acids, bases, metal sludge, and four 5,000-gallon tanks holding waste fuels became involved in the fire.

A highway next to the site was closed; the facility and an area 1.5 miles north and one mile east of the facility in the path of a large smoke plume were evacuated. The fire was fully extinguished three days later.

FUEL BLENDING OPERATIONS

The waste fuel blending industry grew from a need to provide large quantities of fuel to cement production kilns while providing a way to reuse flammable hazardous waste. For years, cement producers have burned flammable hazardous waste liquids, such as solvents, thereby reducing raw fuel consumption and cost. Fuel demand for cement production and availability of flammable waste has increased the amount of hazardous waste-derived fuels being blended by smaller operations.

Fuel blenders process many types of hazardous wastes, such as paints, solvents, and used oil, into fuels with sufficient heat value for use in cement kilns. The specifications for the fuel blend (e.g. BTU value and amount of impurities) are normally established by the cement kiln operator, dictated by the emissions standards set for that kiln.

By 1996, over 140 U.S. companies were blending and processing fuels derived from hazardous wastes for use in cement kilns.

These facilities are subject to regulations under the Resource Conservation and Recovery Act (RCRA) for the treatment, storage, and disposal of hazardous waste. The RCRA regulations establish general operating practices and procedures for blending operations. For example, "the owner or operator of a facility that treats, stores or disposes ignitable or reactive waste, or mixes incompatible waste or incompatible wastes and other materials, must take precautions to prevent reactions which: (1) Generate extreme heat or pressure, fire or explosions, or violent reactions; ..." (US EPA, 40 CFR 264.17)

Although the regulations do not place extensive requirements on the types of hazardous wastes that can be blended, some states prohibit the blending of certain wastes. "Beyond these restrictions, the specifications for the hazardous wastes that are blended into fuels are primarily determined by the cement producers, whose operations must meet the regulations' standards for emissions and other requirements." (US GAO, 1996)

ACCIDENT INVESTIGATION

Because of the severity of the consequences and the opportunity for lessons learned, EPA conducted a limited accident investigation to better understand and communicate the major causal factors contributing to this event. EPA's investigation focused on the fuel blending operations and characteristics of the substances involved.

Fuel Production and Chemicals

Chief produced various fuels by blending different wastes composed primarily of spent (used) solvents and cleaners (liquid and sludge).

Several months prior to this incident, Chief instituted a practice of adding "lab pack" materials, which had been left on-site by the previous owners of the facility, to the fuel blending process. "Lab packs" are containers that hold small jars, bottles or other containers of assorted laboratory chemicals destined for disposal. These lab packs contained various oxidizers including perchlorates, nitrites, and chlorates.

Compatibility tests performed by Chief's lab personnel on the lab pack oxidizers showed that mixing different oxidizer groups caused reactions, ranging from simple heat buildups to small detonations. The lab personnel were concerned about these reactions; consequently various types of oxidizers from the lab packs were separated from each other. Five-gallon buckets were used to store the segregated oxidizers for later addition to the waste fuel blend.

Blending Process and Equipment

Chief blended wastes in two, 1,000 gallon vertical tanks called "dispersers." The disperser involved in the incident was equipped with a mixer (a blade mounted on a shaft connected to a motor on top of the tank). The blade was positioned about 1½ feet from the bottom of the tank.

To avoid excessive splashing and generation of vapors and fumes, the mixer was not supposed to be started until the liquid level in the disperser fully covered the blade; the amount needed to cover the blade was 400-500 gallons (between seven to nine 55-gallon drums of liquid), or about half of the tank capacity. The disperser was open to the atmosphere; no nitrogen or other inert gas blanketing was used to suppress flammable vapors.

The disperser had two top openings: a large semicircular "half-moon" opening with a tray for adding liquids from 55-gallon drums; and a one foot square opening used for adding lab packs.

A grate was positioned across the large opening to keep any "large chunks" in the waste from falling into the tank. Typically, wastes of greater fuel value and lower contamination were added to the disperser first followed by lower grade materials to achieve a better quality fuel blend.

Oxidizers were to be added to the fuel blend only after ensuring that the disperser was 3/4 full and the mixer running, according to an unwritten procedure used by lab personnel.

Chief employees stated that there was no concern for adding the oxidizers to the liquid fuels, but addition might be dangerous if the oxidizer powders were mixed together without a large quantity of liquid fuel in the disperser. The liquid fuel acted as a heat sink for the oxidizers.

The Incident

On the day of the incident, two workers were on top of the disperser pouring liquids from 55-gallon drums into the disperser. They were starting a new batch and only four drums of liquid had been added to the tank when a lab employee at the top of the tank added one bucket of chlorates, one bucket of perchlorates, and one bucket of nitrites (about 3-4 inches of dry material in each 5gallon bucket) to the disperser. The mixer was not running at this time.

Thirty-to-sixty seconds after the oxidizers were added and while waste from a fifth drum was being dumped into the tank, liquid suddenly erupted back out of the large tank opening, followed by an explosion and fireball. The fireball fatally engulfed the employee who was pouring the drums and started a large fire in the building. The fire spread to other flammable materials stored throughout the building.

Chemical Hazards - Oxidizers

As noted above, Chief attempted to dispose of a variety of strong oxidizers including chlorates, nitrites, and perchlorates. Strong oxidizers generally are considered to be incompatible with many organic substances because of the potential for dangerous reactions.

EPA indicates that chlorates, perchlorates, and other strong oxidizers are potentially incompatible with alcohols, halogenated hydrocarbons, other reactive organic compounds and solvents, and other flammable and combustible wastes. The potential consequences of mixing such incompatible materials are fire, explosion, or violent reaction.

Although "It is possible for potentially incompatible wastes to be mixed in a way that precludes a reaction . . . ," none of the examples provided applies to mixing oxidizers with organic substances. EPA knows of no method of mixing oxidizers with oxidizable substances that would preclude a reaction (US EPA).

Perchlorates in particular may undergo hazardous reactions with organic substances and have been involved in a number of hazardous incidents. "Mixtures of any perchlorates with oxidizable substances are . . . highly explosive and must be treated accordingly . . . avoid friction, heating, sparks, or shock from any source, and provide suitable isolation, barricades, and protective clothing for personnel." (Schumacher, 1960)

Further, methyl, ethyl, benzyl, and propyl perchlorate are readily formed by reaction of perchloric acid with the corresponding alcohol (Schumacher, 1960 and Bretherick, 1985); ethyl perchlorate formed from ethanol and perchloric acid is "reputedly the most explosive substance known" (Bretherick 1985). In addition, the above alcohols can also react violently or explosively with perchlorates (Kirk-Othmer, 1995).

Chemical Analysis

EPA collected residue samples at various locations after the incident to determine what chemical substances may have been present and what may have triggered the explosion. Exhibit 1 lists the substances and concentrations found in samples taken from the disperser where the accident originated. The exhibit also notes potential reactions of each substance with oxidizers and perchlorates or perchloric acid.

Most of the substances present after the explosion are flammable or combustible. The phenols and benzyl alcohol are readily oxidizable and could have participated in reactions (possibly violent) with the oxidizers added to the mixture.

In addition, the phenols and the alcohol are hydroxyl compounds and potentially could have reacted with perchlorates to form perchlorate esters (which are generally very explosive), particularly if free perchloric acid was present along with the perchlorate salt or formed when the perchlorate salt was added to the solvent mixture.

Although more extreme conditions are required than for phenols and alcohols, the ketones and aromatic hydrocarbons could have been oxidized under some conditions by the oxidizers added to the mixture (e.g., other reactions could have provided enough heat to initiate oxidation; materials that might act as a catalyst could have been present). The ketones and two of the aromatic hydrocarbons (toluene and xylenes) are commonly used in printing ink solvents handled by Chief (Kirk-Othmer, 1995).

Exhibit 1: Substances Detected in Samples Collected From Top of Disperser

Chemical	**Conc. (mg/L)**	**Potential Reaction with Oxidizers**	**Potential Reaction with Perchlorates (Other than Oxidation)**
Ketones - Solvent for rotogravure inks; limited use for flexographic inks. (Flammable)			
Acetone	7,000	Oxidized by strong oxidizers under vigorous conditions to carboxylic acids (not found in residues). Could be oxidation product of isopropyl alcohol.	None reported.
Methyl ethyl ketone	2,700	Oxidized by strong oxidizers under vigorous conditions to carboxylic acids (not found in residues). Could be oxidation product of alcohol.	None reported.
Phenols Not commonly used as solvent. Phenolic resins are used in certain types of inks. (Combustible)			
4-Methyl phenol (p-Cresol)	32	Phenols readily oxidize to a variety of products	Not reported - might expect formation of perchlorate esters with perchloric acid, by analogy with alcohols.
Phenol	276	Same as above.	Same as above.
Aromatic Alcohol - Not commonly used as solvent in printing ink. (Combustible)			
Benzyl alcohol	353	Oxidized by strong oxidizers to benzoic acid.	Potentially could form benzyl perchlorate (reported to be explosive) in reaction with perchloric acid.
Aromatic Hydrocarbons - Some solvent use for rotogravure inks. (Flammable)			
Ethyl benzene (Not commonly used as solvent in printing ink)	370	Side-chain oxidation by strong oxidizers under vigorous conditions.	None reported.
Toluene (Solvent for rotogravure inks.)	14,000	Side-chain oxidation by strong oxidizers under vigorous conditions to benzoic acid, other products.	None reported.
Xylenes (Solvent for rotogravure inks.)	2,400	Side-chain oxidation by strong oxidizers under vigorous conditions.	None reported.

KEY FINDINGS

The immediate cause of the explosion and fire was most likely a violent reaction of oxidizers in the disperser in the presence of flammable liquid and vapor. Since only four drums had been dumped into the previously empty disperser, only about 9" of liquid would be in the bottom of the tank, or about half of the amount needed to reach the mixer.

This allowed the solid oxidizers to pile up at the bottom of the tank, most likely right below the small tank opening, in direct contact with each other and with flammable solvent liquid and vapor. Although the exact chemical mechanism is not precisely known, given the chemicals present in the disperser residue (Exhibit 1), a violent reaction could have occurred because:

- The waste printing ink solvents typically handled by Chief could have violently reacted with the perchlorates added to the disperser.
- The perchlorate salt could have contained free perchloric acid, or perchloric acid possibly could have formed when the salt was added to the solvent mixture. If the solvent contained even a small amount of ethanol (or other alcohols), and if even a small amount of perchloric acid was present, explosive ethyl perchlorate (or other explosive organic perchlorate esters) could have been formed.
- Waste printing ink solvents potentially could contain a variety of pigment residues that could react violently with strong oxidizers. Such a reaction could have initiated or contributed to the explosion.

Contributing Factors

Several management and operational safety factors contributed to the reaction, explosion and fire, contributed to the reaction, explosion and fire, including, but not limited to:

- Although chemical compatibility tests were conducted on the oxidizers and concern was raised about the potential for an adverse reaction, the reaction chemistry, potential for explosion and fire in the blending operation, recognition of accident history, and evaluation of hazards may not have been completely examined, understood, or documented prior to instituting the practice of adding lab pack materials to the fuel blends.
- Lab results and concerns were not communicated clearly to all other operators. No system for instituting and documenting such communications was in place at the facility.
- Although a procedure for adding the oxidizers to the waste fuel blend was established, it was not evaluated for safety or documented as a Standard Operating Procedure (SOP). The consequences of deviation from this procedure were not evaluated, communicated or understood. It is not known if any training on this procedure occurred or if the company had a management system for SOPs.
- No controls, barriers, or layers of protection, other than the unwritten procedure, were established to ensure that the mixing procedure was always followed, to minimize the consequences of human error, or to preclude or minimize the possibility of an abnormal reaction situation or its consequences when the oxidizers were added to the solvent mixture.

STEPS FOR ACCIDENT PREVENTION

Disposing of oxidizers by mixing them with organic solvents is generally recognized as inherently hazardous; common references warn against mixing oxidizers with organic or combustible materials. Perchlorates, which Chief added to the solvent mixture, are recognized as a particularly severe explosion hazard. Many past accidents have been reported involving explosions and fires that have resulted from reactions between oxidizers and organic substances.

Although the analysis presented here does not identify the exact cause of the explosion and fire at Chief, the analysis shows that the potential for such an incident exists whenever strong oxidizers, such as those used at Chief, are mixed with oxidizable and combustible organic substances, like the solvent mixture at Chief. When the oxidizer is a perchlorate, as was one of the oxidizers mixed with solvents at Chief, the danger increases.

Here are some steps that facilities should take to address the hazards of reactions between oxidizers and waste fuels. If these hazards are not well understood and addressed, oxidizers and oxidizable substances (fuels) must not be mixed because of the potential for dangerous unknown reactions.

These steps are based on the findings associated with this incident and on the recognition that most chemical accidents can be successfully prevented if a management system is in place that ensures that all chemical and process hazards are well understood. Facilities should be designed, constructed, maintained, and safely operated day-after-day with those hazards under control. This approach, and these steps, applies to any facility handling any hazardous substance.

- The chemicals and reaction mechanisms associated with the substances mixed or blended must be well understood and documented. Facilities need to conduct the necessary information searches or laboratory tests to ensure that all reaction mechanisms are known and documented, especially those that may trigger fires or explosions as a result of abnormal situations or changes in chemicals mixed.
- Chemical and process hazards must be understood and addressed. Once the reaction mechanisms are well understood, facilities need to ensure that process equipment, controls, and procedures are designed, installed, and maintained to safely operate the process. A formal hazard review using techniques like ‘What-If’ or ‘Hazop’ can help identify opportunities for failure (e.g., human error, mechanical failure) and layers of protection to minimize the consequences of such failures, based on established codes and standards, industry practices, regulations (federal or state) and common sense.
- All employees need to understand the chemical and process hazards. All personnel should openly communicate information about hazards and process conditions and understand the consequences of deviations and unusual situations. Facilities should establish mechanisms for documenting and sharing such information.
- Standard Operating Procedures (SOPs) are essential to safe operations. Facilities should establish a system to develop and maintain written SOPs and ensure that they are understood and followed at all times. The SOPs must address all phases of operation, safe limits for operation,

consequences of deviation, and identification of corrective measures during emergency situations.

- Before starting a process or procedure that has been changed or modified, the chemical and process hazards must be evaluated. Abnormal or non-routine circumstances are a leading factor in chemical accidents. Facilities should make use of management of change (MOC) and pre-startup safety review techniques to ensure that modified processes or procedures will function as intended without unanticipated impacts on other operations.
- Employees must be properly trained in the processes they work on using the SOPs for that process or job tasks. Training must include potential hazards, reduction of those hazards, safety consequences if procedures are not followed, and proper emergency response to abnormal situations. Training should contain clear and concise objectives that can easily be evaluated for operator competence.

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RUPTURE HAZARD FROM LIQUID STORAGE TANKS

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required.

EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Problem

Over the past few years, there have been several catastrophic failures of liquid fertilizer storage tanks resulting in property damage and environmental contamination. These ruptures have involved site-erected storage tanks with capacities ranging from 500,000 to 1.5 million-gallons. The tank failures, which prompted this alert, were all built by either Carolyn Equipment Company of Fairfield, Ohio, or Nationwide Tanks Inc. of Hamilton, Ohio.

Both of these companies have since gone out business. (Carolyn Equipment in 1990 and Nationwide Tanks in 1995.) This alert describes some of the tank failures and identifies standards and precautions that apply to aboveground liquid storage tanks. Owners of tanks produced by these two manufacturers are advised to take extra precautions to guard against tank failure.

NOTE: Though all failed storage tanks cited in this alert have been produced by these two companies, owners of all storage tanks should be aware of the risks associated with operating a storage tank.

Accident History

3/1997 in Iowa - A 1-million gallon tank containing ammonium phosphate ruptured and released its contents. The walls of the ruptured tank fell onto two other tanks and broke their valves. One tank contained 1- million gallons of a nitrogen liquid fertilizer and the other tank held ammonium thiosulfate. Much of the release was contained by an earthen dike, but immediate construction of a secondary, temporary dike was necessary to keep the release from flowing into the nearby Missouri River. Cleanup involved pumping the liquid out of the dikes and removing all contaminated soil.

7/1999 in Michigan - A 1-million gallon tank full of ammonium polyphosphate ruptured and damaged three other tanks. Fortunately, the tanks were surrounded by earthen dikes lined with polyethylene. This minimized the environmental damage.

1/8/2000 in Ohio - A 1-million gallon tank of liquid fertilizer ruptured and damaged four adjacent tanks. The wave of liquid broke a concrete dike wall and hit five tractor-trailer rigs, pushing two of the rigs into the river. A total of 990,000 gallons of material were released. More than 800,000 gallons of the liquid spilled into the Ohio River. Sampling detected amounts of the fertilizer mixture 100 miles downstream, which is expected to increase algae growth in the river. The company has discontinued use of seven other tanks purchased from the same manufacturer.

3/8/2000 in Ohio - At the same facility, a 1.5million gallon tank of ammonium phosphate ruptured and damaged three nearby tanks causing them to leak. Two of the damaged tanks held phosphoric acid and the third one held ‘Ice-Melt’, a magnesium chloride mixture. The released liquid overflowed the dike walls into nearby creeks. The four tanks were dismantled after the incident.

Over 1.8 million gallons of contaminant were recovered, with an additional 450,000 gallons of contaminated water recovered from the sewer system. The release caused evacuation of a nearby school, and the public was forced to use bottled water because of concern that the drinking water supply may be contaminated by the spilled chemicals.

Hazard Awareness

Defective Welds

In the incidents cited, all of the above-ground liquid storage tanks that failed appeared to have had defective welds.

The tanks were all produced by either Carolyn Equipment Company or Nationwide Tanks Incorporated. Both companies have since gone out of business.

The tanks were under warranty for only one year, and the welding of the tanks was done by subcontractors hired by the two companies.

The companies built tanks in Michigan, Ohio, Indiana, Illinois, Missouri, and Iowa between 1980 and 1995. Because of increased frequency in tank failures, the Ohio Fire Division is creating a voluntary registry of liquid storage tanks to help track and prevent similar failures.

Chemicals Involved

The failed tanks have held liquid fertilizers, such as ammonium phosphate, which are not considered hazardous and are not regulated by the U.S. Environmental Protection Agency. However, the failure of these tanks can damage nearby tanks containing hazardous substances and cause releases. In some cases, accidents have involved tanks containing hazardous materials like anhydrous ammonia and phosphoric acid, which are used to produce the fertilizer ammonium phosphate.

Hazard Identification

Facilities should evaluate their storage tanks for potential catastrophic failure. Some of the factors to consider include:

- Manufacturer's record for quality workmanship.
- Evidence of weakened or defective welds.
- Signs of corrosion around the base and direct contact with ground and exposed to moisture.
- Exposure to high winds or frequent precipitation.
- Age of the tank.
- Close proximity to other storage tanks containing hazardous chemicals.

Hazard Reduction/Prevention

The failure of liquid storage tanks can stem from inadequate tank design, construction, inspection, and maintenance. Hazard reduction and prevention starts with good design and construction. The risk to tanks already in service can be reduced through tank maintenance and weld inspection. To minimize effects from possible tank failures, there should be a secondary containment such as a dike or a berm surrounding the tank.

Tank Design and Construction

A tank should be designed and constructed according to API-650, "Welded Steel Tanks for Oil Storage:" issued by the American Petroleum Institute (API). API-650 specifies an allowance for corrosion and for the specific gravity of the fertilizer liquid. In each of the tank failures mentioned, welding has been the main cause of failure. To ensure durability and integrity, it is imperative that the tank is welded correctly. Several standards and specifications outline the proper techniques and procedures for welding including API-653, "Tank Inspection, Repair, Alteration, and Reconstruction."

Operational Hazards and Maintenance

Tank buyers should insist on seeing the inspection record. Although tanks should undergo a rigorous inspection by a recognized inspection authority before a manufacturer's job is complete, the tanks should still be closely inspected by the buyer prior to purchasing the unit. For liquid storage tanks, the most important item to look for is complete penetration and complete fusion of the welds joining shell plates. Once a tank has been purchased, it becomes the tank owner's duty to regularly inspect the tank.

Inspection intervals may be set by using a risk-based inspection theory, as indicated by API-653. Various inspection methods can be used for those tanks already in service. Radiography is the technique applied to all tanks designed to API-650 to ensure that complete penetration and fusion of welded joints has occurred. Unfortunately, this procedure cannot detect poor mechanical properties in the welded regions.

This and other standards cover what types of joints must be checked by a radiograph, as well as the number of tests that must be done. Additional inspections may be done visually or by a vacuum box for localized problems. The vacuum box, approximately 6 inches by 30 inches, is tightly sealed to the tank surface, and pressure is applied. Automated ultrasonic testing can be applied to all shell welds to examine for cracks, fusion and penetration, and porosity with greater resolution than radiography. It is also now possible to conduct floor scanning while the tank is full. Combined with chemical analysis and hardness testing, field replication can assess the toughness, or resistance to brittle failure of a weldment. If damage is found during an inspection, this needs to be assessed in accordance with APIRP579 "Fitness for Service" methodology. Any tanks that do not meet the acceptance requirements set by API-RP579 should be repaired or replaced.

Steps for Safety

Here are some additional ways to prevent rupture of liquid storage tanks:

- Realize the inherent risk of using and maintaining any storage tanks.
- Identify the manufacturers of the tanks on the property, being careful to identify any tanks built by either company mentioned in this alert. NOTE: If tanks were manufactured by Carolyn Equipment Company or Nationwide Tanks of Hamilton, take the following actions immediately:
    - o A close external inspection should be made for leaks, corrosion, or any anomalies in the surface of the tank. Vent(s) should be checked for any blockages by foreign materials, such as snow or ice. The majority of the failures have occurred during the winter months, when steel becomes more brittle and when vents can become blocked by snow and ice. If liquid is drawn out of the tank when vents are plugged or restricted, a vacuum may be pulled on the tank causing it to collapse inward.
    - o If you find evidence of leakage or corrosion during the inspection, the tank should be taken out of service and if possible, drained.

- If there is no evidence of leakage or corrosion, arrange for an external evaluation by a qualified inspection agency.
    - Depending on the results of the evaluation, arrange for an internal inspection immediately or within the year.
- Ensure that employees are aware of the hazards associated with the failure of a liquid storage tank.
- Avoid overfilling tanks.
- Perform regular inspections of tanks. Be sure to look for all possible risks.
- Follow up on identified problems with repairs or replacement. Inspections are otherwise useless.
- Replace, repair, or modify any and all tanks not meeting the standards set forth in API-579, "Fitness for Service" methodology.
- Be on the alert for new tank regulations. (There were recently changes made to API-653 that improved the suggested calculations)
- Consider better mitigation in case of a leak to separate the content of a collapsing tank from the rest of the facility, and more importantly, prevent any leakage from going offsite.
- Develop an emergency plan that addresses a catastrophic tank failure.

Information Resources

References with information about the hazards of catastrophic failures and methods of minimizing them are listed below. Regulations potentially applicable to storage tanks and codes and standards that may be relevant are also included. A Chemical Safety Alert on catastrophic fires and explosions in storage tanks is available at www.epa.gov/swercepp/pubs/cat-tnks.pdf

Statutes and Regulations

Section 112(r) of the Clean Air Act focuses on prevention of chemical accidents. Facilities with regulated substances or other extremely hazardous substances have a general duty to prevent and mitigate accidental releases. Accident prevention activities include identifying hazards and operating a safe facility.

EPA's Risk Management Program (RMP) Rule [40 CAR 68] is intended to prevent and mitigate accidental releases of listed regulated substances. RAMP rule requirements include development of a hazard assessment, a prevention program, and an emergency response program.

EPA has tank inspection regulations under the Spill Prevention Countermeasure and Control Plan and Oil Pollution Control Act of 1990 [40 CFR112].

The Occupational Safety and Health Administration's (OSHA) Process Safety Management Standard [29 CAR 1910.119] includes regulations on tank inspection, and conduct during hot-work; and fire protection and prevention during welding, brazing, and cutting [29 CAR 1910.252].

Codes and Standards

The American Petroleum Institute (API) has tank standards and guidelines on safe welding:

Relevant API standards:

API Standard 620 – Design and Construction of Large, Welded, Low-Pressure Storage Tanks, ninth edition, February 1996 (includes Addendum 1, December 1996)

API Standard 650 – Welded Steel Tanks for Oil Storage, ninth edition, May 1993 (includes Addendum 1, December 1994; Addendum 2, December 1995; and Addendum 3, December 1996).

API Standard 653 – Tank Inspection, Repair, Alteration, and Reconstruction, second edition, December 1995 (inc. Addendum 1, December 1996)

The American Society of Mechanical Engineers (ASME) has the Pressure Vessel Code and other codes relevant to tanks and storage vessels

The American Society of Nondestructive Testing (ANT) certifies welding and non-destructive examination (NDE) and non-destructive testing (NDT) inspectors

The American Welding Society (AWS) certifies welding inspectors with the designation AWS QC-1 (Quality Control) Welding Inspector and has guidelines on safe welding.

SAFE STORAGE AND HANDLING OF SWIMMING POOL CHEMICALS

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. We are striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required.

EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon the circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Problem

Pool chemicals may become a hazard when they become wetted by a small quantity of water or when they are improperly mixed, such as with other chemicals or reactive materials. Although the potential hazards of swimming pool water treatment and maintenance chemicals, also referred to as "pool chemicals," have been recognized for some time, news media reports over the last five years still show a significant number of fires, toxic vapor releases, and personnel injuries in which pool chemicals were a factor (See Table 1).

A number of the pool chemicals, especially those exhibiting oxidation properties, can potentially be highly reactive and capable of generating high temperatures, as well as releasing toxic vapors if improperly handled or stored. Reactivity may be triggered by water wetting the chemical, or by the inadvertent mixing of a pool chemical with an incompatible material. Some pool chemicals are self-reactive over time, even without moisture addition or mixing with other materials.

The products of this decomposition may include chlorine gas which may cause the corrosion of piping and other metal equipment in poorly ventilated areas. These chemicals are packaged in "breathable" containers to avoid pressure buildup while in storage. A partial listing of pool chemicals includes chlorinated isocyanurates, lithium hypochlorite, sodium bicarbonate, potassium monopersulfate, hydrogen peroxide, sodium hypochlorite, calcium hypochlorite, and certain ammonium, brominated, copper and silver compounds, and muriatic acid.

Pool chemicals involved in fire or toxic vapor release are likely to include those that add chlorine or a chlorine ion to the pool water for bacterial control. Chemicals that release chlorine are among the group of chemicals that are classified as oxidizers. These pool oxidizer chemicals include calcium hypochlorite, sodium hypochlorite, and chlorinated isocyanurates. Other pool chemicals are used to control the growth of algae or fungus, to adjust the acidity or alkalinity (pH control), and to clarify pool water.

Large, nonresidential pools may use chlorine stored as a liquid under pressure in metal containers. The Chlorine Institute, Inc. and the Occupational Safety and Health Administration (OSHA) provide guidance on the operation of pressurized chlorine systems (see Information Resources section of this Alert).

Hazard Triggers

The purpose of this Alert is to provide guidance associated with normal operating conditions and routine tasks for storage and handling of pool chemicals. It does not address the precautions to be taken by first responders in case of a fire, a large spill, or the release of toxic vapors.

Wetting: Under normal circumstances, pool chemicals are intended to be added to large quantities of water. If, instead, a limited volume (amount) of water is added to a chemical, an unwanted reaction may occur, resulting in an increase in temperature and the release of toxic gas. Even a small amount of water splashed on the chemical may in some cases trigger a strong reaction. The main exception to this rule concerning water addition is when very large quantities of water are needed for fire fighting, as discussed below. Although the chemicals are usually packaged in plastic bags that are stored in sturdy cartons or drums, accidents have occurred when water leaked into damaged or open containers. Possible sources of water entry have been traced to:

- Rain water from a roof leak or from an open or broken window;
- Wet floor when the stored chemicals were not elevated off the floor;
- Leakage from fire suppression sprinkler system; or
- Hose-down water generated during area cleanup.

There are other sources of water that may come in contact with pool chemical packages, including high humidity in summer weather. However, the effects of humidity are more likely to be slow-acting, with the rate of temperature buildup and chlorine gas release being less severe.

Chlorine is corrosive to metals such as steel and copper. Instances have been reported where exposed water piping has become corroded causing leaks, and also where metal storage shelves have corroded and collapsed, leading to chemical spillage.

Improper Mixing: The most common pool chemicals are inherently incompatible with each other. Intentional or accidental mixing of incompatible chemicals is likely to lead to a chemical reaction that may generate temperatures high enough to ignite nearby combustible materials. Mixing can also lead to the release of highly toxic and corrosive chlorine gas. Reactions have also been traced to the mixing of old (partially decomposed) and new chemicals of the same type. The mixing of pool chemicals with completely unrelated materials such as swept material from the floor, oily rags, and other miscellaneous materials have been known to cause strong reactions with the potential for a resulting fire. Improper chemical mixing incidents have occurred when:

- Tools and equipment used to handle one chemical were used with a different chemical before being cleaned;
- Spilled substances (e.g., from damaged containers or from sloppy handling) and other miscellaneous substances on floors were swept up together and mixed; and
- Containers, residues, or wastes are disposed resulting in inadvertent mixing in disposal containers or at waste disposal sites.

Liquid chemicals, such as sodium hypochlorite (bleach), if spilled, can leak into other containers or seep into cracks in the floor. Liquids, because of their properties, can create hazards not associated with solid or granular products and must be carefully handled.

Hazard Control

Facility management is responsible for knowing and understanding the hazards associated with these chemicals and ensuring that pool chemicals are safely stored and handled. Hazardous substances are capable of being safely handled day-after-day through a management system that ensures that good, written procedures are prepared, posted, and followed by trained employees. Also, the facility needs to be properly designed and maintained. Finally, facility management should very carefully plan for emergencies and work with first responders to mitigate incidents that occur.

Recommendations for addressing the major hazards associated with pool chemicals are described below.

Keep Pool Chemicals Dry. Facility management should design and maintain designated areas for pool chemical storage so that water does not come in contact with containers or packaging.

Any evidence of potential water entry from the following possible sources should receive prompt corrective attention:

- Roof, windows, and doors;
- Wall and floor joints;
- Water pipes or hoses and sprinkler systems; and
- Drains.

You should look for ways to prevent water contact with stored pool chemicals such as:

- Close containers properly;
- Cover opened or damaged packaging;
- Store chemicals away from doors and windows;
- Ensure that there are no roof leaks, open or broken windows, or leaks from water pipes, hoses, or the sprinkler system;
- Ensure that floors are sloped to keep water drained away;
- Store chemicals on shelves or pallets to keep containers off the floor;
- Use waterproof covers on packaging;
- Exercise particular caution to prevent water contact with stored chemicals any time water is used for cleanup of floor areas near stored packages; and
- Ensure that water will not back up from faulty or clogged floor drains.

Avoid Chemical Mixing. You should conduct a review of chemical storage arrangements and chemical handling tasks to identify situations where chemicals could be intentionally or accidentally mixed:

- Separate incompatible substances; avoid storing containers of liquids above containers of other incompatible substances;
- Do not mix old chemicals with fresh chemical, even if they are the same type;
- Consider separate, designated tools for each chemical. Handle only one chemical at a time and make sure that tools used with one substance are not used with another unless all residues are removed;
- Use separate, designated containers for cleanup of spilled materials to avoid inadvertent mixing of spilled substances. Consult your local hazardous waste disposal facility for more detailed information on proper waste disposal; and
- Make chemical storage area housekeeping a priority. Don't allow rags, trash, debris, or other materials to clutter hazardous material storage area. Keep combustible and flammable substances away.

For storage and handling of large quantities, see the American Chemistry Council (formerly the Chemical Manufacturers Association) Guidelines in the Safe Transportation, Handling, and Storage of Dry Chlorinated Pool Chemicals -2001 listed under the Recommended Reading section of this Alert, for guidance on stack height and separation of different chemical types and separation of oxidizers from combustibles.

Fire Prevention. Facility management should prevent a chemical reaction ignition by avoiding wetting or mixing chemicals as described above.

Avoid having combustible or flammable materials near the chemicals, particularly gasoline, oil, paint solvents, oily rags, etc. Do not allow ignition sources, such as gasoline, diesel, or gas powered equipment such as lawn mowers, motors, or welding machines, in the storage area. Also, do not allow smoking in the storage area. Review bulk storage, including packaging and storage locations, relative to potential for accidental contact with water, including sprinkler systems, rainwater, etc.

Emergency Response and Fire Fighting. Facility management should work with local first responders (fire departments, emergency medical teams) and the LEPC on emergency response and fire fighting. LEPC contact information can be found at the website listed in the Other Useful Websites section. The Recommended Reading section provides sources of information on fire prevention and fire fighting associated with pool chemicals.

Note also that once started, fires involving pool chemicals are difficult to attack. Keep in mind that:

- Do not use dry chemical or halon-type fire extinguishers where chlorine gas may be evolving. These agents react negatively with chlorine.
- In extinguishing a fire, only large volumes (copious flow) of water should be applied and then only by persons trained in chemical fire response. Caution must also be exercised to protect against wildlife damage due to contaminated water runoff.
- Large quantities of water should be applied to the burning combustibles to remove heat and for fire intensity control.
- Once started, the reaction of wetted or mixed chlorinated pool chemicals may continue generating heat, unless the material is cooled below its heat of reaction temperature or until all chlorine is used.

Protective Measures

Pool chemicals can cause injury if they directly contact a person's skin, eyes, or respiratory or digestive system. The chemical will immediately react when wetted by perspiration, tears, mucus, and saliva in the nose, throat, and respiratory and digestive systems. Such injuries may occur from direct chemical contact with the skin or if chemical dust in the air contacts eyes, is inhaled, or settles on food that is consumed.

Protect Employees from Exposure. Consult the chemical manufacturer's safety instructions as well as the Material Safety Data Sheets (MSDSs) for guidance on the appropriate personal protective equipment (PPE) necessary to protect your employees. Also, share MSDSs with local emergency medical responders and practitioners.

The following protective measures address conditions that may arise during normal operations or the execution of routine tasks. If, however, additional information is needed for fire, spill, or release intervention, we suggest that you contact the LEPC (see Other Useful Websites).

See that PPE is kept clean, in proper operating condition, and available for use when needed and that the following practices are observed:

Use basic PPE including, as a minimum, chemical goggles and liquid impervious gloves, and boots for any chemical handling activities.

For frequent or extended chemical handling activities, add a face shield and liquid impervious apron or coveralls to the basic PPE.

As a minimum, use a National Institute for Occupational Health and Safety (NIOSH) approved air-purifying respirator, when airborne chemical dust or mist may be present. 29 CFR 1910.134 Respiratory Protection covers the OSHA requirements for respiratory protection.

For additional information on proper selection and use of PPE, consult the OSHA regulatory standards. In addition:

- Consider development of work practices to minimize dust generation and accidental contact with pool chemicals;
- Provide a means of ready access to water (e.g., safety showers, eye wash stations, etc.) for removal of chemicals that may accidentally contact employees;
- Consider appropriate first aid and coordinate with local first responders and medical professionals for treatment of accidental exposure until professional medical treatment can be provided;
- Avoid accidental ingestion by storing and consuming foods and beverages away from chemical storage and handling locations, and ensure that employees wash before eating, drinking, etc.; and post the numbers for the local emergency responders, and medical practitioners that are familiar with the appropriate treatment for the chemical present.

Information Resources

Recommended Reading

The American Chemistry Council has several guidelines:

Guidelines in the Safe Transportation, Handling, and Storage of Dry Chlorinated Pool Chemicals 2001 combines and supercedes the 1995 editions of the Guidelines for Safe Handling and Storage of Calcium Hypochlorite and Chlorinated Isocyanurate Pool Chemicals and Guidelines for Safe Transportation of Calcium Hypochlorite and Chlorinated Isocyanurate Pool Chemicals. This publication discusses product nomenclature; incompatibilities, hazards, and characteristics; storage; processing guidelines; personal protective equipment; first aid; emergency procedures; handling minor spills; do's and don'ts and emergency telephone numbers. This very clear and comprehensive publication is also available from a number of Chlorinated Pool Chemical (CPC) Panel member companies. It is strongly recommended reading for those responsible for storage and handling of pool chemicals.

The National Fire Protection Association (NFPA) has a bulletin for pool chemicals and a code for safe storage of liquid and solid oxidizers:

NFPA Alert Bulletin – Pool Chemicals – 1998, 4 pages – prepared for the fire services and others in order to raise their awareness of hazards created by pool chemicals stored in retail establishments. This Alert bulletin discusses two major fires where pool chemicals were stored. It also gives details concerning two types of fire suppression equipment that should not be used for fires where pool chemicals are involved.

NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, 2000 edition – 16 pages. The 2000 edition was revised to include a section addressing storage and handling at retail stores. It provides a number of useful definitions including the definition of Class 3 Oxidizers which include most pool water treatment chemicals. NFPA 430 also points out the hazards associated with not only the use but also the presence of dry chemical or halon-type fire extinguishers in an area containing oxidizer-type chemicals. NFPA 430 also points out the ineffectiveness of any extinguishing system that relies upon a smothering effect since the oxidizer chemicals do not require air to maintain reaction.

The Chlorine Institute has several pamphlets of interest, including:

Sodium Hypochlorite Safety and Handling, Pamphlet 96, May 2000

The Canadian Transport Emergency Center, CANUTEC, has written an article in response to the calls received from individuals and fire departments requesting information on pool chemicals.

Swimming Pool Chemicals - revised September 1999 - by Jacques Savard, Ph.D. This paper covers spills, disposal, neutralization, and first aid. The paper is available on CANUTEC's website and is particularly recommended reading.

EPA's Chemical Emergency Preparedness and Prevention Office has previously written an advisory targeted at LEPC's concerning chemicals used at swimming pools that may release chlorine:

Advisory: Swimming Pool Chemicals: Chlorine, OSWER 90-008.1, June 1990. This publication is available from the EPA National Service Center for Environmental Publications (NSCEP).

Statutes and Regulations

In addition to the recommendations for improved hazard control, you may be subject to certain regulations. In particular, you need to determine whether the following regulations related to emergency planning, release reporting, and hazardous materials worker protection are applicable to your facility.

EPA

Emergency Planning & Community Right-to-Know

- Emergency Planning [40 CFR Part 355] Facilities that have listed substances above a specified threshold quantity must report to their LEPC and SERC and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355]- Facilities that release listed chemicals over reportable quantity must immediately report the release to the LEPC and the SERC.
- Hazardous Chemical Reporting [40 CFR Part 370]- Facilities that have listed chemicals at or above threshold quantity must submit MSDSs to their LEPC, SERC, and local fire department and comply with the Tier I/ Tier II inventory reporting requirements.
- Toxic Chemicals Release Inventory [40 CFR Part 372] - Manufacturing businesses with ten or more employees that manufacture, process, or otherwise use listed chemicals above an applicable threshold must file annually a Toxic Chemical Release form with EPA and the state.

Comprehensive Environmental Response, Compensation, and Liability Act

- Hazardous Substance Release Reporting [40 CFR Part 302]- Facilities must report to the National Response Center any environmental release which exceeds reportable quantities. A release may trigger a response by EPA, or by one or more Federal or state emergency response authorities.

OSHA

- Hazardous Waste Operations and Emergency Response Standard [29 CFR 1910.120]- Facilities must comply with worker protection requirements for emergency response operations for release of, or substantial threats of release of, hazardous substances.
- Process Safety Management Standard [29 CFR 1910]- Facilities with highly hazardous substances in quantities at or above a threshold quantity are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.
- Hazard Communication [29 CFR 1910.1200] Facilities are required to evaluate the potential hazards of toxic and hazardous chemicals. Employers transmit this information to their employees.

Table 1 Recent Incidents Involving Swimming Pool Water Treatment Chemicals			
Month Year	**City State**	**Brief Description of Incident**	**Effect**
February 2000	Elizabethtown, Tennessee	Fire and smoke from a storage facility that contained chemicals including swimming pool water treatment chemicals. The fire was in an area isolated from the pool chemicals, however particular precautions were taken to prevent the pool chemicals from becoming involved.	Local school closed early to relieve traffic congestion; local residents advised to remain indoors. No injuries reported.
October 1999	Avon, Indiana	Fumes released from container of a strong acid that was being used to clean a high school swimming pool.	School evacuated. No injuries reported.
August 1999	Burlington, New Jersey	A pallet containing 400 lbs of calcium hypochlorite spilled at a warehouse. The spill was caused by the corrosion of steel shelving on which the material was stored. The spilled material mixed with other incompatible materials, resulting in fire and release of products of combustion and decomposition including chlorine gas.	Five warehouse workers were hospitalized from the toxic gas exposure. Twenty-four others were treated and released.
August 1999	Bergen County, New Jersey	Granular chlorinating material, similar to that used for swimming pool water treatment, spilled while moving a container in a warehouse.	Released vapors sent 28 government workers to area hospitals.
July 1999	Richmond, Virginia	Chemical exploded as it was prepared for release into apartment complex pool.	One employee injured.
June 1999	Cleveland, Ohio	Toxic fumes released at local community center swimming pool, when pool water chemicals including muriatic acid were inadvertently mixed.	Two fire fighters and two others injured and area evacuated.
February 1999	Fort Worth, Texas	Fire, smoke and vapors released from large warehouse containing pool chemicals and other materials. The cause of the fire was not reported.	Warehouse destroyed. No injuries reported; residents told to remain indoors.
December 1998	Auburn, New Hampshire	Small explosion and vapors were released when about a cup of swimming pool chemical was improperly disposed of at a regional waste treatment station.	Four minor injuries. Waste treatment station shut down.
July 1998	Dayton, Ohio	Toxic cloud was generated when muriatic acid was inadvertently mixed with a chlorinator product at local community center swimming pool.	Nine people sent to the hospital.
June 1997	Watervleit, New York	Water leaking from sprinkler system wetted water reactive pool chemicals, starting fire at pool chemical storage, repackaging and distribution building. Smoke and chlorine gas released into building and area.	Nearby residents evacuated as a precautionary measure.
July 1996	Chatsworth, California	Fire and toxic vapor release at a swimming pool supply facility was attributed to improper mixing of muriatic acid and sodium hypochlorite (bleach).	Three people were injured and an eight-block area was closed to traffic.

SHAFT BLOW-OUT HAZARD OF CHECK AND BUTTERFLY VALVES

HOME

The Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) are issuing this Alert as part of their ongoing efforts to protect human health and the environment by preventing chemical accidents. Under CERCLA, section 104 (e), the Clean Air Act (CAA), and the Occupational Safety and Health Act (OSH Act), EPA and OSHA have authority to conduct chemical accident investigations. Additionally, in January 1995, the Administration asked EPA and OSHA to jointly undertake investigations to determine the root cause(s) of chemical accidents and to issue public reports containing recommendations to prevent similar accidents.

EPA and OSHA have created a chemical accident investigation team to work jointly in these efforts. Prior to the release of a full report, EPA and OSHA intend to publish Alerts as promptly as possible to increase awareness of possible hazards. Alerts may also be issued when EPA and OSHA become aware of a significant hazard. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

Certain types of check and butterfly valves can undergo shaft-disk separation, and fail catastrophically or “blow-out”, causing toxic and/or flammable gas releases, fires, and vapor cloud explosions. Such valve failures can occur even when the valves are operated within their design limits of pressure and temperature.

ACCIDENT HISTORY

In a 1997 accident, several workers sustained minor injuries and millions of dollars of equipment damage occurred when a pneumatically assisted Clow stub-shaft Model GMZ check (non-return) valve in a 300 psig flammable gas line underwent shaft blow-out. The valve’s failure caused the rapid release of large amounts of light hydrocarbon gases which subsequently ignited, resulting in a large vapor cloud explosion and fire.

The check valve was designed with a drive shaft that connects the internal valve disk to an external pneumatic cylinder.

The valve failed when a dowel pin designed to fasten the drive shaft to the disk sheared and a key designed to transfer torque from the drive shaft to the disk fell out of its keyway, disconnecting the drive shaft from the disk. System pressure was high enough to eject the unrestrained drive shaft from the valve, carrying with it the external counterweight assembly, weighing over 200 lbs., a distance of 43 feet away.

The absence of the drive shaft left a hole in the valve body the diameter of the shaft (3.75 inches) directly to atmosphere, and initiated a high-pressure light hydrocarbon leak.

The leak continued for approximately 2 to 3 minutes, forming a large cloud of flammable light hydrocarbon vapor. The vapor cloud ignited, resulting in an explosion felt and heard over 10 miles away.

The explosion and ensuing fire caused extensive damage to the facility, completely or partially destroying many major components, piping systems, instruments, and electrical systems, and requiring the complete shut-down of the affected unit for cleanup and repair.

Minor damage occurred to nearby residences and automobiles (mostly broken glass and minor structural damage due to the blast wave).

Nearby highways were closed for several hours. Damage cost to the facility alone is estimated at approximately 90 million dollars. Fortunately, no fatalities and only minor injuries to workers resulted from the accident.

Previous malfunctions involving check valves of the same or similar design occurred at facilities in 1980, 1991, and 1994.

In each case, the affected check valve was located in a large diameter (36-inch or greater) pipe in a hydrocarbon gas compression system. Also in each previous case, a dowel pin fastening the valve’s drive shaft to its disk sheared (in the 1980 case the pin was possibly never installed) and a rectangular key fell out of its keyway, disconnecting the drive shaft from the disk.

Although shaft-disk separation occurred in each previous case, it did not result in shaft blow-out or catastrophic failure.

This may be because the valves in these instances were installed in lower-pressure service, or because the malfunctioning valves were identified before shaft blow-out occurred.

In the 1991 incident, the malfunction was manifested by the erratic operation of the valve, which was observed to operate independently from its external drive mechanism.

System pressure was low enough (70 psig) that the failure was detected before the shaft was expelled out of the valve body. (At the time the malfunctioning valve was identified, the valve shaft was protruding about 0.75 inches out of the valve body.)

In the 1980 and 1994 cases, the malfunction was identified when workers noted that the external piston rod connecting the air-assist cylinder to the drive shaft had broken due to axial movement of the drive shaft.

HAZARD AWARENESS

Check and butterfly valves are used in many industries, including refineries, petrochemical plants, chemical plants, power generation facilities, and others. Most modern valve designs incorporate features that reduce or eliminate the possibility of shaft blowout. However, older design check and butterfly valves with external appendages such as pneumatic-cylinders, counterweights, manual operators, or dashpots may be subject to this hazard. Shaft blow-out may be of particular concern wherever these valves are installed in systems containing chemicals leading to hydrogen embrittlement.

Valves subject to this hazard may be designed with a two-piece valve stem (sometimes referred to as a "stub-shaft" design). In each of the cases described above, the malfunctioning component was a Clow stub-shaft Model GMZ pneumatically assisted swing check valve. In these check valves, one stem piece functions as a drive shaft that connects the internal valve disk to an external air-assist cylinder and counterweight assembly.

The drive shaft penetrates the pressure boundary through a stuffing box. The exterior portion of the drive shaft is connected to a pneumatic piston and counterweight, and the interior portion of the shaft is coupled directly to the valve disk using a cylindrical hardened steel dowel pin and a rectangular bar key.

This arrangement provides a power-assist to close the valve during compressor shut down, preventing reverse flow of compressed gases.

These particular valves have probably not been produced since 1985, but still exist in some process facilities constructed before that date.

Similar valves currently or previously produced and sold by other valve manufacturers may also be subject to this hazard.

Factors in Valve Failure

A number of design and operational factors may contribute to this hazard. These include the following:

Design Factors

- The valve has a shaft or stem piece which penetrates the pressure boundary and ends inside the pressurized portion of the valve. This feature results in an unbalanced axial thrust on the shaft which tends to force it (if unconstrained) out of the valve.
- The valve contains potential internal failure points, such as shaft dowel-pins, keys, or bolts such that shaft-disk separation can occur inside the valve.
- The dimensions and manufacturing tolerances of critical internal parts (e.g., keys, keyways, pins, and pin holes) as designed or as fabricated cause these parts to carry abnormally high loads (e.g., in the 1997 accident, the dowel pin rather than the key transmitted torque from the shaft to the disk).
- The valve stem or shaft is not blow-out resistant. Non blow-out resistant design features may include two-piece valve stems that penetrate the pressure boundary (resulting in a differential pressure and unbalanced axial thrust as described above), single-diameter valve shafts (i.e., a shaft not having an internal diameter larger than the diameter of its packing gland) or shafts without thrust retaining devices, such as split-ring annular thrust retainers.

Operational Factors

- The valve is subject to high cyclic loads. In all of the above incidents, the valve repeatedly slammed shut with great force during compressor trips and shutdowns. Such repeated high stresses may cause propagation of inter-granular cracks in critical internal components, such as dowel pins.
- The valve is subject to low or unsteady flow conditions, such that disk flutter or chatter occur, resulting in increased wear of keys, dowel pins, or other critical internal components.
- Valves in high-pressure service lines may be more likely to undergo shaft blow-out (in the 1997 accident, system pressure at the failure point was approximately 300 psig).
- Valves used in hydrogen-rich or hydrogen sulfide-containing environments may be more susceptible to blow-out due to hydrogen embrittlement of critical internal components, particularly if these are made from hardened steel (as was the dowel pin in the 1997 accident).

HAZARD ABATEMENT

Facilities should review their process systems to determine if they have valves installed that may be subject to this hazard.

If so, facilities should conduct a detailed hazard analysis to determine the risk of valve failure. Check valves or butterfly valves which are subject to several or all of the above design and operational factors are at high risk for shaft blow-out.

Detailed internal inspections may be necessary in order to identify high-risk valves. Facilities should consider replacing high-risk valves at the earliest opportunity with a blow-out resistant design.

Several blow-out resistant designs of check and butterfly valves are available.

If immediate valve replacement is impossible or impractical, facilities should consider immediately modifying the valves to prevent shaft blow-out. Valve manufacturers should be consulted in order to ensure that any modifications made are safe.

NFORMATION RESOURCES ON VALVE SAFETY

Some sources of information on valve safety are listed below.

General References

Information on cases of valve failure can be found in T. Kletz, What Went Wrong?, 3rd Edition, Gulf Publishing Co., Houston (1994). This reference contains general information related to check valve failure (pp 127, 129, and 175) and cites one specific case of check valve failure (page 124) similar to those described in this Alert.

Information on hydrogen embrittlement can be found in F.P. Lees, Loss Prevention in the Process Industries: Hazard Identification, Assessment, and Control, 2nd edition, Butterworth-Heinemann Publishing, Oxford (1996), pp 12/82-83.

Codes, Standards, and Regulations

The American Society of Mechanical Engineers (ASME) has a standard for valves. Relevant ASME standards include:

- ASME B16.34-1996 — Valves - Flanged, Threaded, and Welding End, an American National Standard.

The American Petroleum Institute (API) has several relevant standards and Recommended Practices. Relevant API standards include:

- API 598-1996 — Valve Inspection and Testing
- API 570-1993 — Piping Inspection Code: Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems
- API 941-1991 — Steels for Hydrogen Service at Elevated Temperatures and Pressure in Petroleum Refineries and Petrochemical Plants

Relevant API Recommended Practices include:

- RP 574-1992 — Inspection of Piping, Tubing, Valves and Fittings
- RP 591-1993 — User Acceptance of Refinery Valves

Applicable regulations include:

- 29 CFR 1910.119 Process Safety Management of Highly Hazardous Chemicals; Explosives and Blasting Agents.

USE MULTIPLE DATA SOURCES FOR SAFER EMERGENCY RESPONSE

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements.

Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations is also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

A critical consideration when choosing a response strategy is the safety of emergency responders.

Adequate information about on-site chemicals can make a big difference when choosing a safe response strategy.

This information must include: name, toxicity, physical and chemical characteristics, fire and reactivity hazards, emergency response procedures, spill control, and protective equipment.

Generally, responders rely primarily on Material Safety Data Sheets (MSDSs) maintained at the facility.

However, MSDSs may not provide sufficient information to effectively and safely respond to accidental releases.

This Alert is designed to increase awareness of MSDS limitations, so that first responders can take proper precautions, and identify additional sources of chemical information, which could help prevent death or injury.

ACCIDENTS

In May 1997, a massive explosion and fire occurred at an agricultural chemical packaging facility in eastern Arkansas.

Prior to the explosion, employees observed smoke in a back warehouse and evacuated. The facility called local responders and asked for help to control smoldering inside a pesticide container. The local fire department rapidly responded and reviewed the smoldering product's MSDS. The MSDS lacked information on decomposition temperatures or explosion hazards. The firefighters decided to investigate the building. While they were approaching, a violent explosion occurred. Fragments from a collapsing cinder block wall killed three fire fighters and seriously injured a fourth.

In April 1995, an explosion and fire at a manufacturing facility in Lodi, New Jersey caused the death of five responders. The explosion occurred while the company was blending aluminum powder, sodium hydrosulfite, and other ingredients. Even though the material was water reactive, the MSDS for the product advised the use of a "water spray... to extinguish fire." The recommendation in the MSDS for "small fires" was to flood with water; however, "small fire" was not defined, the amount of water necessary was not specified, and no information dealt with how to respond to large fires (which can occur during blending processes).

The MSDS ONLY described the hazards associated with the product. In this case, responders needed information on the hazards associated with the reactivity during the blending process (which was significantly different from the product).

Emergency responders should note that the chemical information provided on an MSDS usually presents the hazards associated with that particular product. Once the product is placed in a process some factors may change, resulting in the increase/decrease, or elimination of hazards. These factors may include reactions with other chemicals and changes in temperature, pressure, and physical/chemical characteristics.

OSHA requires that MSDSs include:

- Chemical identity (product by chemical and common names);
- Chemical and common names of all hazardous ingredients;
- Physical and chemical characteristics (such as vapor pressure, flash, boiling or freezing points);
- Fire and explosion hazards;
- Reactivity hazards (how will the chemical react with other chemicals, air, or water);
- Health hazards (acute and chronic, symptoms of exposure);
- Precautions for safe handling; and
- Control measures.

The MSDS also must include the name and telephone number of the individual who can provide additional information on appropriate emergency procedures.

MSDSs in the WORKPLACE

In 1988, the Occupational Safety and Health Administration (OSHA) required facilities storing or using hazardous chemicals to comply with the Hazard Communication Standard.

This standard requires employers to provide employees with an MSDS for every hazardous chemical present onsite, and to train those employees to properly recognize the hazards of the chemicals and to handle them safely.

MSDSs normally provide information on the physical/chemical characteristics and first aid procedures. This information is valuable for employees to safely work with the chemical.

However, the content for MSDSs on emergency response procedures, fire, and reactive hazards may be insufficient for local responder use in an emergency situation.

Vagueness, technical jargon, understandability, product vs. process concerns, and missing information on an MSDS may increase the risk to emergency responders.

MSDSs are provided by manufacturers, importers and/or distributors.

MSDS chemical hazard information can vary substantially depending on the provider. Sometimes this discrepancy is due to different testing procedures.

However, whoever prepared the MSDS is responsible for assuring the accuracy of the hazard information.

The following chart summarizes information from various MSDSs for the chemical azinphos methyl and it illustrates how different sources can provide varied and conflicting information.

Information from the Computer-Aided Management of Emergency Operations (CAMEO) Response Information Data Sheets (RIDS) also is provided.

Comparison of MSDS Data for Azinphos Methyl - AZM (CAS NO. 86-50-0)

	Hazard ratings	**Reactivity Hazards**	**Incompatibility**	**Fire Hazards**
MSDS – A	Health - 2 Flammability - 0 Reactivity - 0	Stable under normal conditions Hazardous polymerization will not occur	High temperatures, oxidizers, alkaline substances	Vapors from fire are hazardous
MSDS – B	None listed	Depends on characteristics of dust; decomposes under influence of acids and bases	Acids and bases	Combustible. Gives off irritating or toxic fumes (or gases) in a fire
MSDS - C	Health - 3 Fire - 2 Reactivity - 2	Stable material. Unstable above 100 EF sustained temperature. Hazardous polymerization will not occur	Heat, moisture	Decomposes above 130F with gas evolution and dense smoke. Dust explosion hazard for large dust cloud
MSDS - D	Health - 4 Flammability - 0 Reactivity - 0	Releases toxic, corrosive, flammable or explosive gases Polymerization will not occur	Heat, flames, sparks, and other ignition sources	Containers may rupture or explode if exposed to heat
CAMEO RIDS	Health - 3 (extremely hazardous) Fire - 2 (ignites when moderately heated) Reactivity - 2 (violent chemical change possible)	Will decompose	Heat, UV light	Decomposes giving off ammonia, hydrogen and CO

INFORMATION SOURCES FOR FIRST RESPONDERS

Many established fire department hazardous materials teams follow the "Rule of Three", which requires that three sources of information should be consulted before a response decision is made.

Listed below are resources available to help first responders plan the Rule of Three.

This is not a comprehensive list, but rather, a starting point.

- Chemical Inventories -Chemical inventory records filed by the facilities in their jurisdiction under the Emergency Planning and Community Right-to-Know Act for basic hazard and storage information. -It is a good practice to gather information from various sources on the hazards and proper response for those chemicals.

  This information can be used to enhance emergency response procedures between local officials and facilities.

  Newly required Risk Management Program (RMP) information provided by facilities will provide local responders with process and chemical hazards and facility-specific response information.
- Assistance From Others - Emergency personnel and local officials have several avenues to obtain additional information about chemical hazards and proper response options in an emergency.

It is essential that local response and planning officials know what these resources are and how to obtain them quickly and effectively.

One of the key elements is the ability of the responders to correctly interpret available data. Most are not chemists nor health professionals. Many of the resources listed below can help with these interpretations.

- Training - Local officials should ensure that all responders have sufficient training in hazardous materials response.

  The National Fire Protection Association (NFPA) 472 Standard on Professional Competence of Responders to Hazardous Materials Incidents specifies minimum competencies. State Fire Training Academies and State Emergency Management Offices can provide more information on training.

  This training will form a foundation to better understand chemical information.
- Pre-planning with facilities that store or use hazardous materials is critical to local officials and helps to identify specific concerns for each facility and opportunities to prepare effectively for those concerns, or to reduce existing risks.

  Sufficient and correct information regarding chemicals in an accidental release may make the difference between a successful emergency response and a potential disaster for local responders and the community they are protecting.

Statutes and Regulations

The following are a list of some federal statutes and regulations related to emergency planning, release reporting, and hazardous materials worker protection.

EPA

Emergency Planning and Community Right-to-Know

- Emergency Planning [40 CFR Part 355] Facilities that have listed substances above a specified threshold quantity must report to their Local Emergency Planning Commission (LEPC) and State Emergency Response Commission (SERC) and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355] Facilities that release listed chemicals over reportable quantities must immediately report the release to the LEPC and the SERC.
- Hazardous Chemical Reporting [40 CFR Part 370] Facilities that have chemicals at or above threshold quantities must submit MSDSs to their LEPC, SERC, and local fire department and comply with the Tier I/ Tier II inventory reporting requirements.
- Toxic Release Inventory [40 CFR Part 372] Manufacturing businesses with ten or more employees that manufacture, process, or otherwise use listed chemicals above an applicable threshold must file annually a Toxic Chemical Release form with EPA and the state.

Comprehensive Environmental Response, Compensation, and Liability Act

- Hazardous Substance Release Reporting [40CFR Part 302]- Facilities must report to the National Response Center any environmental release which exceeds reportable quantities. A release may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

OSHA

- Hazardous Waste Operations and Emergency Response Standard [29 CFR 1910.120] Worker protection requirements for emergency response operations for release of, or substantial threats of release of, hazardous substances.
- Process Safety Management Standard [29 CFR 1910]- Highly hazardous substance in quantities at or above a threshold quantity are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.
- Hazard Communication [29 CFR 1910.1200] Requires that the potential hazards of toxic and hazardous chemicals be evaluated and that employers transmit this information to their employees.

Sources of Information	
CAMEO RIDS	Developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA, provides access to safety and emergency response information on more than 4,700 hazardous chemicals. Distributed by the National Safety Council.
Chemfinder Webserver	A single master list of chemical compounds, which provides physical and chemical data, and then references other sources with additional information.
Chemical Health & Safety Data	Health and safety information on over 2,000 chemicals studied by the National Toxicology Program.
Chemical Reactivity Worksheet **(New Product)**	Provides information on the reactivity of substances or mixtures of substances. It includes a database of over 4,000 chemicals and their special hazards.
Cornell University	Electronic MSDSs from various manufacturers on over 325,000 chemicals.
DOT North American Emergency Response Guidebook	A guide to aid first responders in (1) quickly identifying the material and (2) protecting themselves and the general public during an initial response. Over 5,000,000 copies of the guide have been provided to the local emergency response community.
EHS Chemical Profiles and Emergency First Aid Guides	Information on the 300+ Extremely Hazardous Substances in EPCRA, which includes physical/chemical properties, health hazards, fire and explosion hazards, reactivity data, and other response information.
Glossary of MSDS Terms	Includes 106 terms commonly found on an MSDS. Can also search for MSDSs for specific chemicals.
Hazardous Materials Guide	Information on over 1,750 materials, providing response scenarios, identification of materials, glossary of terms, and other references to effectively respond to an incident.
HazDat Database	Developed by the Agency for Toxic Substances and Disease Registry, provides information on the release of hazardous substances and the effects on the health of human populations.
International Chemical Safety Cards	Concise and simple information on hazards on approximately 1,000 chemicals.
Medical Management Guidelines for Acute Chemical Exposures Patient Information (FAQs)	Aid for emergency room physicians and other healthcare professionals who manage acute exposures from chemical incidents. Used to effectively decontaminate patients, communicate with other personnel, and provide competent medical evaluation and treatment.
NFPA	Provides the NFPA chemical hazard labels system for indicating the health, flammability, and reactivity hazards of chemical.
NIOSH Pocket Guide	Source of general industrial hygiene information on hundreds of chemicals including exposure limits, properties, incompatibilities and reactivities, respirator selections, symptoms of exposure, and emergency treatment.
Vermont SIRI	Electronic MSDSs from various manufacturers on approximately 200,000 chemicals
EPA/CEPPO	Risk Management Programs/EPCRA information and contacts

CHEMICAL EMERGENCY PREPAREDNES AND PREVENTION ADVISORY: Hydrogen Fluoride

HOME

This advisory recommends ways Local Emergency Planning Committees (LEPCs) and chemical facilities can reduce risks posed by the presence of hydrogen fluoride (HF) in their communities.

Hydrogen fluoride, a strong inorganic acid, is produced and used as a gas or liquid without water (i.e., in anhydrous form), or in a water (aqueous) solution.

The anhydrous form is potentially more hazardous than hydrogen fluoride in dilute water solutions, because anhydrous hydrogen fluoride has greater potential for fuming and forming vapor clouds.

If anhydrous hydrogen fluoride is accidentally released, it may react with water vapor to form a white vapor cloud. Under certain conditions, such a cloud has the potential to travel considerable distances close to the ground and pose a threat to people in its path.

EPA stresses that although mishandling of HF can cause harm, there is no cause for undue alarm about its presence in the community when it is properly and safely managed.

Inhalation of hydrogen fluoride vapor, either in anhydrous form or from water solutions, can cause· irritation if the exposure is mild (i.e., low concentration in air for a short time), or severe damage to the respiratory system or death in the case of exposure to high concentrations.

Contact with the liquid or vapor can severely burn skin, eyes, and other tissue.

Burns from hydrogen fluoride are particularly dangerous and require immediate and special treatment by trained medical personnel.

The largest use of hydrogen fluoride is in the manufacture of fluorine-containing chemicals, particularly chlorofluorocarbons (CFCs).

Hydrogen fluoride may be used in some petroleum refinery operations, aluminum production, nuclear applications, glass etching and polishing, and metal treating and cleaning.

Although major incidents involving hydrogen fluoride have been rare, one example was an accident at a Texas petroleum refinery. A construction accident at an alkylation unit resulted in the release of 30,000 to 50,000 pounds of hydrogen fluoride and isobutane. The vapors migrated to an adjacent residential area. Eighty-five square blocks and approximately 4,000 residents were evacuated. There were no fatalities. More than 1,000 residents went to three neighboring hospitals. Although about 100 were admitted, most of those reporting to hospitals were treated on an outpatient basis. In some cases, there were reports of skin irritation and irritation to the eyes, nose, throat, and lungs. Some vegetation in the path of the cloud was also damaged.

Federal Requirements:

Hydrogen fluoride's acute toxicity prompted EPA to list it as an extremely hazardous substance (EHS), with a threshold planning quantity (TPQ) of 100 pounds, under Section 302 of the Emergency Planning and Community Right-to-Know Act (commonly known as SARA Title III).

OSHA's Process Safety Management Standard, published February 24, 1992, requires facilities with anhydrous hydrogen fluoride in quantities at or above the threshold of 1,000 pounds to implement process safety management to protect employees by preventing or minimizing the consequences of chemical accidents.

In addition, OSHA regulations require that facility employees who could potentially be exposed to hydrogen fluoride in any form be trained to handle and use it safely and to recognize and deal with the potential hazards posed by this chemical.

EPA regulations required under the Clean Air Act soon will require facilities with HF above a threshold quantity to prepare risk management plans; these plans will be provided to LEPCs and the state.

RECOMMENDED STEPS FOR LEPCS

Section 302 of SARA Title III requires LEPCs to develop comprehensive emergency plans to address facilities where hydrogen fluoride as well as other EHSs arc present in excess of their threshold planning quantities (100 pounds for hydrogen fluoride). Because an accidental release of hydrogen fluoride can pose a significant health and safety hazard, EPA suggests that LEPCs take the following steps:

Hazards Analysis/Hazard Identification:

- Know which facilities produce or use hydrogen fluoride. These facilities include:
  - Chemical manufacturers (e.g., chlorofluorocarbons, fluorine, organic and inorganic fluorine compounds, linear alkylbcnzcncs);
  - Petroleum refinery alkylation units;
  - Aluminum producers;
  - Pharmaceutical companies; and
  - Uranium processors.
- Facilities that produce or use water solutions of hydrogen fluoride, which may be less hazardous than

pure hydrogen fluoride, particularly if the solutions arc dilute, include:
  - Chemical manufacturers (e.g., some inorganic fluorine compounds);
  - Stainless steel producers;
  - Manufacturers of metal products;
  - Electronic equipment manufacturers;
  - Transportation equipment manufacturers;
  - Aerospace industry; and
  - Glass manufacturers.
- Know routes and methods of HF transportation in the area.

Note: There are many other names for hydrogen fluoride.

Hydrogen fluoride without water may be called anhydrous hydrogen fluoride; HF; AHF; HF-A; hydrofluoric acid; hydrofluoric acid, anhydrous; or anhydrofluoric acid. Water solutions of hydrogen fluoride may be called hydrofluoric acid; hydrofluoric acid, aqueous; hydrofluoric acid solution; aqueous HF; HF 70% (or other concentration); hydrofluoric acid 70% (or other concentration); or fluorhydric acid.

HF Characteristics:
- Be aware of the characteristics that make hydrogen fluoride hazardous, including:
  - It is highly toxic;
  - Depending on temperature and concentration, it may be highly corrosive to many substances (e.g., dilute HF attacks most common metals);
  - It can become airborne if released above its boiling point of 67° F; and
  - Anhydrous hydrogen fluoride may form a vapor cloud containing aerosol if released under certain conditions. Depending on the conditions, the cloud may travel considerable distances while remaining close to the ground.

Vulnerability Analysis:
- Example exposure guidelines include:
  - IDLH (30 ppm for 30 minutes) and
  - ERPG-3 (50 ppm for 1 hour).
- When modeling potential releases of hydrogen fluoride, take into account its important properties, such as possible behavior as a dense gas (heavier than air), aerosol formation (HF vapor and droplets), and reaction with water vapor. In addition to including the chemistry of HF in vulnerability analysis, it is important to include other factors such as release rate, release quantity, meteorological conditions, and area topography.
- Note that the physical and chemical behavior of hydrogen fluoride is complex upon release and models not designed to address this behavior may provide inaccurate estimates of dispersion and downwind concentrations.
- Identify vulnerable populations in potentially high concentration areas.

Emergency Planning/Testing the Plan:
- Ensure that the facilities covered by Sections 302, 311, and 312 of SARA Title III have provided to the LEPCs and local fire departments adequate information about hydrogen fluoride at their location. Gather information about smaller quantities of hydrogen fluoride as well. (Not all facilities using or storing hydrogen fluoride will meet the reporting thresholds.) The LEPC can request material safety data sheets (MSDSs) for hazardous chemicals present at a facility in amounts below the threshold.
- Review methods facilities use to detect and respond to releases.
- Engage in a dialogue with facilities regarding methods for preventing accidental releases of hydrogen fluoride and systems in place to reduce the off-site risk if release should occur. On-site means of reducing off-site risks may include emergency transfer systems, water spray mitigation systems, remotely-operated isolation valves, HF detectors, and HF inventory reduction. Be aware that the effectiveness of these methods may be site specific. For example, reducing inventories could possibly lead to an increase in transportation-related risk.
- Regularly exercise and review Title III plans to ensure that facilities handling large quantities of hydrogen fluoride are covered, and that emergency response issues concerning possible releases of hydrogen fluoride have been addressed. Consider whether plans should include protection in place and/or evacuation in case of a hydrogen fluoride release.
- Determine if the local emergency response plan is consistent with the facility's response plan.
- Ensure that local hospitals and physicians are properly trained and prepared to treat victims of hydrogen fluoride exposure; in particular, ensure that they are aware of the special hazards of hydrogen fluoride exposure and are equipped to treat such exposure.

Right-to-Know/Risk Communication:
- Inform the community of the potential hazards of HF, as well as emergency response methods for treating victims of hydrogen fluoride exposure.
- Send a copy of this advisory to all fire departments, medical facilities, and hydrogen fluoride facilities in your LEPC jurisdiction, calling their attention to the recommended steps for facilities in the section below.

RECOMMENDED STEPS FOR FACILITIES

In cooperation with LEPCs and local response officials, facilities should take the following steps:

Handling and Storage:

- Protect HF-containing vessels and piping from impact by vehicles, machinery, or falling objects. Heavy objects should not be lifted over equipment containing hydrogen fluoride if it is possible to avoid doing so. If not possible, potentially affected equipment should be emptied prior to the lift.
- Ensure that all containers, piping, valves, and fittings contacting hydrogen fluoride are constructed of hydrogen fluoride-resistant materials. These materials may include special alloys (such as Monel), specially-treated metals, corrosion-resistant substances such as Teflon, and Hastelloy-B. Carbon steel is generally used for anhydrous hydrogen fluoride. Hydrogen fluoride is incompatible with glass, concrete, and other silica-based materials. Even dilute solutions of hydrogen fluoride should not be stored in glass containers.
- In industrial use, anhydrous HF may contain some water. Improper control of moisture may result in accelerated corrosion.
- Carry out regular inspections of equipment used for hydrogen fluoride (including transfer hoses) for thickness and cracks, fractures, or defects due to corrosion or mechanical stress. Include welds in the inspection.
- Refer to Department of Transportation (DOT) regulations for shipping, packaging, marking, and labeling requirements.

Employee Safety:

- Ensure that adequate training is provided to all facility employees concerning the safe handling, storage, and use of hydrogen fluoride.
- Ensure adequate training is provided to all employees concerning the need to wear personal protective clothing and equipment that is appropriate to the task for both emergency and non-emergency situations.
- Ensure that adequate training is provided to all employees concerning emergency and notification procedures in the event of an accident.
- Ensure that the proper protective equipment is easily accessible in case hydrogen fluoride is released. Train employees in the proper use of the equipment. Inspect and test the equipment regularly.
- Have trained medical and/or emergency response personnel and adequate supplies (including first aid supplies) on site, or quickly available, to provide proper first aid in case of exposure.

Hazard Awareness:

- Avoid unintended contact between hydrogen fluoride and other chemicals. Hydrogen fluoride may react with other substances (e.g., alkalies, some oxides, sulfides, and cyanides), sometimes violently, and sometimes producing toxic gases.

Risk Minimization:

- Use good design and engineering practices for locating equipment containing hydrogen fluoride to minimize damage from possible equipment ruptures, explosions, or fires.
- Control access to hydrogen fluoride areas to avoid entry by untrained personnel.
- Ensure that no containers are leaking or broken, and conduct regular maintenance checks of all equipment and containers coming in contact with hydrogen fluoride, particularly checking for evidence of corrosion.
- Design hydrogen fluoride facilities with systems to minimize releases in the event of a leak or malfunction (e.g., by providing valves to isolate the area of the leak or providing the means to rapidly transfer the hydrogen fluoride to a different vessel).
- Have procedures in place for quick, organized response in case of a release of hydrogen fluoride.

Emergency Notification:

- In the event of a release, contact the National Response Center [(800) 424-8802], your SERC and LEPC, the local fire department, police department, and other local emergency responders.
- When contacting these organizations, provide the following information: chemical name, estimate of quantity released, time and duration of the release, affected media (e.g., air, surface water, groundwater), potential health risks, and the name and telephone number of a contact person at the facility.

CLEAN AIR ACT AMENDMENTS

Hydrogen fluoride is specifically mentioned in the accidental release provisions of the Clean Air Act Amendments of 1990. This law requires EPA to promulgate an initial list of at least 100 substances that may cause death, injury, or serious adverse effects to human health or the environment. Congress has identified the first 15 substances to be included on this list; hydrogen fluoride is among them. Where regulated substances above the threshold quantity are present at a facility, the owner/operator will be required to prepare a risk management plan that includes a hazard assessment, an accidental release prevention program, and a response program. The law requires that EPA publish regulations under the amended Clean Air Act within three years, and allows facilities an additional three years to comply. Facilities will be required to provide copies of the risk management plan to the LEPC, as well as to the state. Under the Clean Air Act Amendments of 1990, EPA also was directed by Congress to carry out a study of the potential hazards of hydrogen fluoride to the public and to make recommendations for the reduction of such hazards.

OTHER INFORMATION

The following is a list of some sources of information about hydrogen fluoride and the Emergency Planning and Community Right-to-Know Act.

- The American Petroleum Institute (API) Recommended Practice 751, "Safe Operation of Hydrofluoric Acid Alkylation Units."
- API background paper, "The Use of Hydrofluoric Acid in the Petroleum Refining Alkylation Process."
- CHEMTREC, a 24-hour emergency hotline that provides information and assistance to responders during an emergency. Contact (800) 424-9300 (Note: CHEMTREC is for emergency use only.) A call to CHEMTREC will also activate the Chemical Manufacturers Association's HF Mutual Aid Group, comprised of specially trained teams that respond to emergencies involving hydrogen fluoride.
- Response Information Data Sheets (RIDS) that include hydrogen fluoride response information are found in CAMEO™, a computer-based planning and response management program
- Your County or State Health Agency.
- Your State Emergency Response Commission.
- Your EPA Regional CEPP Coordinator. EPA Regional offices are located in Boston, New York, Philadelphia, Atlanta, Chicago, Dallas, Kansas City, Denver, San Francisco, and Seattle.
- EPA's Emergency Planning and Community Right-to-Know Information Hotline at (800) 535-0202
- Chemical Manufacturers Association, Hydrogen Fluoride Panel.
- “Hydrofluoric Acid Anhydrous - Technical: Properties, Uses, Storage and Handling," DuPont Chemicals and Pigments.
- Recommended Medical Treatment for Hydrofluoric Acid Exposure," Allied-Signal, 1991.

CHEMICAL EMERGENCY PREPAREDNES AND PREVENTION ADVISORY: Swimming Pool Chemicals: Chlorine

HOME

This advisory to Local Emergency Planning Committees (LEPCs) suggests that you pay special attention to swimming pool chemicals this summer. Many chemicals used at swimming pools may release chlorine - an extremely hazardous substance (EHS).

Careless storing, wetting, mixing, or the contamination of any of these chemicals or the systems used to feed them can cause fires, explosions, burns, and possibly the release of gaseous chlorine, resulting in injuries or death.

Facilities should train all employees, including summer employees, on the safe use and potential hazards of these chemicals.

EPA stresses that although mishandling of these chemicals can cause harm, there is no cause for undue alarm about their presence in the community.

One example of an incident involving chemicals that release chlorine was a fire at a chemical distribution facility in Springfield, Massachusetts, on June 17, 1988. Rainwater leaked into a storage room where 600 to 800 cardboard drums, each containing 300 pounds of solid swimming pool chemicals (probably trichloroisocyanuric acid), were kept.

The chemicals exploded, starting a fire which set off the sprinkler system. That water soaked the remaining drums and set off more explosions, spreading the fire to other rooms in the building.

The fire, explosions, and release to air lasted three days. Over 25,000 people were evacuated; 275 people were sent to the hospital with skin bums and respiratory problems.

HOW POOL CHEMICALS WORK

At many pools, gaseous chlorine (an EHS) is fed directly into pool water to kill bacteria and other microorganisms. Almost all pools using gaseous chlorine use cylinders containing 100 to 150 pounds of chlorine.

At other pools solid, granular, pellet, or stick compounds (e.g., calcium hypochlorite and chlorinated isocyanurates) or liquids (e.g., sodium hypochlorite) are added to the water. In contact with water, these solid and liquid chemicals dissolve and form hypochloric acid or chlorine ions to perform the same disinfecting function as chlorine.

SOME STEPS FOR LEPCs

While emergency response plans are required to address gaseous chlorine (an EHS) in excess of the threshold planning quantity (100 pounds), they are not required to address these compounds under section 302 of the Emergency Planning and Community Right-to-Know Act (commonly known as SARA Title III).

However, EPA and the National Response Team's Hazardous Materials Emergency Planning Guide (NRT-1) recommend that emergency plans address all hazardous materials that present a risk to the community.

Since these compounds can release chlorine and are so widely used, EPA recommends they receive careful attention in both planning and emergency response.

EPA suggests that local emergency planning committees (LEPCs) take the following steps:

- Identify the swimming pool chemicals that will potentially release chlorine gas. The chemical names of these substances are sodium hypochlorite, calcium hypochlorite, and chlorinated cyanic acids. The box below lists some brand names that contain these chemicals.
- Review Title III plans to ensure that facilities handling large quantities of these chemicals are covered and that response issues have been addressed. Facilities that should be checked include:
  - Swimming pool chemical distributors;
  - Swimming pool supply stores;
  - Swimming pools located, for example, in health spas, community centers, schools, and country clubs;
  - Public drinking water systems;
  - Waste treatment facilities; and
  - Hazardous waste treatment facilities.
- If appropriate, inform owners of residential pools of the hazards related to chlorine.
- Be sure that the facilities covered by sections 302, 311, and 312 of SARA Title III have provided adequate information about the chemicals on hand directly to the LEPC and local fire departments.

  Because many swimming pool chemicals may not be listed as extremely hazardous substances and in some cases reporting thresholds may not be met, you may need to ask facility representatives for chemical information.

  Also, ask about facility emergency response plans, so the LEPC and fire departments can use them to prepare pre-incident plans.

SOME BRAND NAMES

Calcium Hypochlorite

- Olin trademarks for calcium hypochlorite products include: CCH®, Pace®, Sock It®, Constant Chlor®, Prochlor®, Sun Burn®, HTH®, Pulsa®, Sun Burst®
- PPG trademarks for calcium hypochlorite products include: Induclor®, Pittclor®, Sustain®, ® Zappit®, Pittabs®, Repak

Chlorinated Isocyanurates

- Olin trademarks for chlorinated isocyanurates include: CDB®, HTH®, CDB, Clearon®, Pace®, Constant Chlof®, Prochlor®, Sun®,
- Monsanto trademark for chlorinated isocyanurates is: ACL®

Note: Many of these pool chemicals are sold to processors and repackers who resell under various brand names. Such packages will always identify the product inside by its chemical name.

SOME STEPS FOR FACILITIES

- In cooperation with LEPCs and local response officials, ensure attention to storage methods, fire safety systems, and handling and use of chemicals. Be sure the likelihood of releases during handling and storage is minimized. Look at situations where water is a factor since most dry chemicals containing chlorine are reactive with water.
  - Be sure the area used to store potential chlorine releasing chemicals is immune to any influx of water from such things as a leaking roof, uncovered windows, leaking pipes, fire sprinklers, hose outlet in the vicinity, splashing from the pool, flooding of the floor (keep containers off the floor), and the effect of high humidity on open containers. Be aware of potential explosive situations. Explosions have been known to occur when a pool user switched from one type of chlorine tablet in a pool chlorinator to a different type without thoroughly cleaning the device. Even similar chemicals like the chlorinated cyanuric acids may react violently with other types of chlorinated cyanurate compounds or with sodium or calcium hypochlorites.
  - Cylinders of chlorine gas should be stored separately from all other compressed gases, hydrocarbons (gasoline or other fuels), ether, turpentine, and metal filings, shavings, or dust. Contact with these substances poses unusual fire and explosion hazards.
  - Cylinders of chlorine gas should be stored outdoors or in well-ventilated, detached, or segregated areas of noncombustible construction to prevent extensive damage from explosion and fire.
  - Check no containers are leaking, broken, or tom. Ensure that only one container of a product is unsealed at any time.
- Refer to DOT regulations for types of containers that must be used for shipping swimming pool chemicals -- both in the gaseous as well as the solid compound forms. For example, DOT requires metal barrels or drums and packaging to protect against permeation of moisture for calcium hypochlorite and trichloroisocyanuric acid.
- Ensure an adequate training program to educate all facility personnel on the hazards of chlorine gas as well as chlorine- producing chemicals.

OTHER INFORMATION

Information on chlorine and EPCRA can be found in many readily available sources. The following is a listing of just a few of these sources:

- Safety Guidelines for Residential Swimming Pool Chlorination (pamphlet 81) and/or Chlorine Safety at Non-residential Swimming Pools (pamphlet 82), both available free of charge from The Chlorine Institute. The Chlorine Institute has extensive literature on chlorine and chlorine cylinders.
- 1987 Emergency Response Guidebook, published by DOT. (The 1990 version is currently being printed.)
- Response Information Data Sheets found in CAMEO™ II, a computer-based planning and response management program, available from The National Safety Council.
- CHEMTREC, a 24-hour, seven-day a week emergency hotline that provides information and assistance to responders during an emergency. Contact (800) 424-9300. (Note: CHEMTREC is for emergency use only.)
- Your County or State Health Agency.
- Your State Emergency Response Commission.
- EPA's Emergency Planning and Community Research and Special Programs Administration Right-to-Know Information Hotline at (800) 535-0202.

CHEMICAL ADVISORY: Safe Storage, Handling, and Management of Ammonium Nitrate

HOME

The Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) ("we") are issuing this advisory as part of an ongoing federal effort to improve chemical risk management, and to advance safety and protect human health and the environment.

This advisory contains information on recent and past accidents involving AMMONIUM NITRATE (commonly referred to as AN), on the hazards of AN, how to manage these hazards, and appropriate steps for community emergency planning and proper emergency response. It is focused primarily on safe handling and storage of higher density, solid AN pellets and prills (a prill is a small bead) used in fertilizers.

This advisory is intended to broadly disseminate lessons learned from recent incidents involving AN so that such incidents can be prevented in the future. Also provided is a list of information resources, including relevant codes and standards, industry publications, and applicable statutes and regulations that will help facilities handling AN and first responders better understand the hazards so they can effectively manage the risks.

The information provided is not intended to cover all the hazards, safe practices or technical challenges associated with the manufacturing of AN; liquid fertilizers containing AN; manufacturing, storage or use of explosives or blasting agents containing AN; or the transportation of AN. For these particular situations, please consult other sources including the appropriate references, standards and regulations, cited at the end of this document.

ACCIDENTS

In general, AN is manufactured for use as a fertilizer and to produce explosives and blasting agents. There are several other uses in the chemical industry, such as the production of nitrous oxide. These other uses represent a small fraction of amount of AN used in the US.

Although pure AN is stable at ambient temperature and pressure under many conditions, the chemical itself does not burn. AN is a strong oxidizer and it supports and accelerates the combustion of organic (and some inorganic) material, increasing the fire hazard and complicating the fire fighting challenges. AN may explode when exposed to strong shock or when subjected to high temperatures in confinement.

Millions of tons of AN are produced annually in the US. Incidents involving AN are rare, but as is shown in the accidents below, they can have severe consequences. Most recently, on April 17, 2013, a fire at a fertilizer storage and distribution facility in West, Texas, resulted in a detonation of AN fertilizer stored at the facility, killing 15 people, including some of the firefighters responding to the fire. That incident remains under investigation, but much has been learned from other AN explosions.

- On October 2, 2003, a fire and explosion occurred in a double story farm warehouse in St. Romain en Jarez, France, involving 3 to 5 tons of AN stored in bags. This incident killed 26 people, 18 of whom were firefighters. In this incident, improper storage methods are thought to have played a role.
- On September 21, 2001, a massive explosion occurred in a warehouse at the Azote de France fertilizer factory in Toulouse, France, involving 200-300 tons of AN, which was stored in bulk in a hangar. The explosion resulted in the death of 30 people, 2500 injuries, the destruction of the factory, and an additional 10,000 buildings being heavily damaged. The exact cause of this accident remains unknown. Storage of incompatible material with AN is believed to have been a factor.

We have learned several key lessons as a result of these accidents and additions studies of AN, including:

The conditions of storage and the materials co-located with AN while in storage are crucial to the safety and stability of the AN.

Explosions of stored AN are responsible for some of the worst chemical disasters on record. Several of these incidents, including two in Germany in 1921, occurred during attempts to break up large piles of solidified or caked AN and ammonium sulfate mixtures using explosives. In both cases, the initial blast intended to break up solid AN initiated an unintended general detonation of the AN or ammonium sulfate mixture.

AN will self-confine under some conditions. Adding heat, such as a booster charge intended to break up clumps, can initiate a general detonation of the AN.

Other large explosions have been triggered by fires involving AN in confined spaces, including the 1947 explosion in Texas City, Texas, of two cargo ships. In that case, the first ship is thought to have exploded due to a fire in the hold involving AN fertilizer that had been manufactured with a wax coating and stored in paper bags. The wax would have been one potential source of fuel for mixing with the AN, thus creating an explosive situation. The second ship exploded some time later, likely due to a fire caused by the first explosion. These two explosions resulted in deaths of nearly 600, including all but one member of the Texas City Fire Department.

As a result of such accidents and subsequent studies of the properties of AN, caked AN is no longer broken up with explosive materials, and organic material such as wax coatings are no longer used for AN fertilizer.

Our intent in issuing this advisory is to identify actions that should be taken as a result of the lessons learned from the more recent accidents involving AN. Similar to the corrective steps taken following the 1921 and 1947 incidents, this advisory emphasizes the safe steps that should become common practice in the industry and emergency response community in order to prevent the catastrophic loss of life and property damage. Here are some of the things we have learned from accidents involving AN:

AN will self-compress/self-confine under some conditions, becoming much more likely to explode.

AN is at risk for explosion when stored near other material that can add fuel to the AN – such as grain, sugar, seeds, sawdust, and most especially petroleum fuels such as diesel.

AN is a powerful oxidizer and a rich source of nitrate, which provides energy to an explosion. Thus, the presence of fuel and/or heat (and especially both) near AN is a very high hazard situation.

INFORMATION ON HAZARDS

Hazard Classification

For the purpose of transportation, AN that contains less than 0.2 percent combustible substances and AN fertilizers are classified by the U.S. Department of Transportation (DOT), as oxidizers.

AN with more than 0.2 percent combustible substances is classified by DOT as an explosive. (see box below).

The National Fire Protection Association (NFPA) assigns an instability rating of 3 (in a range of 0-4) to AN, meaning AN is capable of detonation, explosive decomposition, or explosive reaction, but that a strong initiating source or confinement in extreme temperatures is required.

AN can explode under certain conditions by adding energy (heat, shock), especially when contaminants are present or it is under confinement.

"Pure" ammonium nitrate is stable and will explode only under extraordinary circumstances. However, the addition of combustible materials such as sugar, grain dust, seed husks or other organic contaminants, even in fairly low percentages, creates a dangerous combination and the ammonium nitrate mixture becomes far more susceptible to detonation. This characteristic of ammonium nitrate underlies most of the advice and recommendations for safe handling contained herein.

Decomposition Chemistry

AN melts at 337° F (170° C) and begins to undergo decomposition when molten. Hazardous scenarios with AN can involve simple thermal decomposition initiated by external fire or other heating, self- sustained decomposition also known as "cigar burning," and detonation.

Decomposition creates toxic gases containing ammonia and nitrogen oxides. The resulting nitrogen oxides will support combustion, even in the absence of other oxygen. The resulting heat and pressure from the decomposition of AN may build up if the reaction takes place in a confined space and the heat and gases created are not able to dissipate. As the temperature rises, the rate of decomposition increases. In a confined space, the pressure can reach dangerous levels and cause an explosion that will include the detonation of the AN.

When dealing with a large quantity of AN, localized areas of high temperature may be sufficiently confined by the mass of material to initiate an explosion. The explosion of a small quantity of AN in a confined space (e.g., a pipe) may act as a booster charge and initiate the explosion of larger quantities (e.g., in an associated vessel).

During a fire in a facility where AN is present, the AN can become hot and molten which makes the material very sensitive to shock and detonation, particularly if it becomes contaminated with incompatible material such as combustibles, flammable liquids, acids, chlorates, chlorides, sulfur, metals, charcoal, sawdust, etc. If a molten mass becomes confined (e.g., in drains, pipes or machinery), it can explode.

Most types of AN do not continue to decompose once a fire has been extinguished. However, some types of AN fertilizers containing a small percentage of chlorides (e.g., potassium chloride) undergo a smoldering (self-sustaining) decomposition that can spread throughout the mass to produce substantial toxic fumes, even when the initial heat source is removed. These fertilizers that can self-sustain decomposition, known as "cigar burners" are normally compound fertilizers that contain between 5% to 25% nitrogen from ammonium nitrate, up to 20% phosphate (as P2O5) and chloride (which may only be present as a small percentage).

Contaminants

AN mixed with oil or other sensitizing contaminants may explode or detonate when exposed to fire or shock. Organic materials (e.g., packing materials, seed, etc.) will increase the likelihood of an explosion and will make the AN explosion more energetic.

AN may also be sensitized by certain inorganic contaminants, including chlorides and some metals, such as aluminum powder, chromium, copper, cobalt, and nickel.

As AN solution becomes more acidic, its stability decreases, and it may be more likely to explode.

Solid AN readily absorbs moisture, which can lead to caking, self-compression and self confinement. This in turn increases susceptibility to explosion in a fire.

The density, particle size and concentration of solid AN in a material, as well as the presence of other additives, affects the hazard of the material. The technical grade of AN is a lower density (higher porosity) prilled material. Higher density prills are used as fertilizer.

AN can be fused with ammonium sulfate fertilizer or amended with carbonate materials to reduce its explosive properties. More information on additives is discussed in Guidance for the Storage, Handling and Transportation of Solid Mineral Fertilizers found in the Reference section. Solid fertilizers are usually coated with an inorganic, non-combustible anti-caking compound to prevent sticking and clumping.

AN in undiluted or pure form has a higher degree of overall hazard than when it is mixed or blended with compatible or non-combustible materials that can reduce the concentration. In general for fertilizer blends containing AN, the more nitrogen they contain, the greater the explosion hazard they pose.

Blended fertilizers containing AN and chloride compounds and blended fertilizers containing AN contaminated with combustible materials or incompatible substances pose increased explosion hazards. A large number of blended fertilizers are produced from basic primary fertilizer products (e.g., ammonium nitrate, urea, and mono-ammonium phosphate) and natural materials (e.g., rock phosphate, potassium chloride) which can introduce contaminants.

All such materials are not necessarily compatible with each other and some may produce undesirable effects when mixed with others. These undesirable effects can include, for example, chemical reaction(s) and physical effects (e.g. stickiness which can cause handling difficulties, moisture migration giving rise to caking tendency). Facilities can consult Guidance for Compatibility of Fertilizer Blending Materials listed in the Reference section to assess potential incompatibility.

The Safety Data Sheet (SDS – formerly MSDS) of the AN product should be used as one source of information to assess the overall hazard. The effects of added components can only be determined after careful review of the SDS and other available hazard literature.

Confinement and/or the addition of fuel to AN creates a real danger of explosion. The addition of heat when either of these conditions exists can lead to disaster. Accordingly, the responder should quickly assess if AN has been involved in the fire and whether the AN has been compromised in any of these ways, and plan the fire response accordingly.

HAZARD REDUCTION

What steps should facility owners or operators take to reduce the hazards of AN during storage and handling?

Storage/Process Conditions to Avoid

Persons engaged in the handling, management or emergency planning for AN must be aware of the hazards of AN and ensure that the conditions that may lead to an explosion are not present. Measures that facilities should take to ensure the safe storage, use and handling of AN include:

- Avoid heating AN in a confined space.
  - Processes involving AN should be designed to avoid this possibility.
  - Avoid localized heating of AN, potentially leading to development of high temperature areas (e.g., AN fertilizer should not be stored near sources of heat such as steam pipes, radiators, hot ducts, light bulbs etc.).
- Ensure that AN is not exposed to strong shock waves from explosives. AN storage near high explosives or blasting agents must conform to ATF's Table of Separation Distances, Title 22 of the Code of Federal Regulations, section 555.220 (22 CFR 555.220).
- Avoid contamination of AN with combustible materials or organic substances such as packing materials, dust, seed, oils, and waxes.
  - If possible, do not co-locate AN, especially bulk AN in bins, with dust-producing organics such as grains or seeds.
- Avoid contamination of AN with inorganic materials that may contribute to its sensitivity to explosion, including chlorides and some metals, such as aluminum powder, chromium, copper, cobalt, and nickel.
  - Pay attention to the materials used to build storage areas and cribs. Wood and aluminum or other metals must be specially treated to prevent impregnation if they are going to be in contact with AN. Metal materials can be treated with epoxy tar or chlorinated rubbers to prevent corrosion of the metal and contamination of the AN.
- Maintain the pH of AN solutions within the safe operating range of the process. In particular, avoid low pH (acidic) conditions.
  - If possible, do not co-locate acids in an AN storage area.
- Keep molten or solid AN out of confined spaces, especially sewers or drains where it can react with organic materials there.

Certain specific safety and handling instructions (required and recommended) apply for safe handling and storage of AN6 under certain conditions:

OSHA's standard for Explosives and Blasting Agents at 29 CFR 1910.109(i) contains requirements for AN stored in the form of crystals, flakes, grains or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade, and other mixtures containing 60 percent or more of AN by weight. AN should also be handled in accordance with safe practices found in NFPA 400 Hazardous Materials Code, Chapter 11.

Building Design

- Store only in one-story buildings and buildings with no basements, unless the basement is open on one side.
- Use fire resistant walls within 50 feet of combustible building or materials.
- Flooring in storage and handling areas should be constructed of noncombustible material or protected from impregnation by AN.
- Avoid installing, or remove or close off any open drains, traps, tunnels, pits or pockets into which molten AN can flow and be confined in the event of fire.
- Buildings should be kept dry and free of water seepage through roofs, walls and floors.
- Have adequate ventilation or be constructed to self-ventilate in the event of a fire to avoid pressurization.
- Do not place AN into storage when the temperature of the product exceeds 130°F (54.4°C).

AN-based materials that are DOT Hazard Class 1 sensitive (explosives or blasting agents) must be handled and stored in accordance with requirements of OSHA's Standard for Explosives and Blasting Agents (29 CFR 1910.109) and ATF's Table of Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives or Blasting Agents (27 CFR 555.220) Facilities should also follow the NFPA 495- Explosive Materials Code, where applicable.

Storage in bags, drums or other containers

- Piles of bags, drums and other containers should be no closer than 36 inches below the roof or supporting beams.
- Bags should be stored no less than 30 inches from walls or partitions.
- Piles of bags, drums, and other containers should not exceed a height of 20 feet, width of 20 feet, and length of 50 feet, unless the building is of noncombustible construction or protected by automatic sprinklers.
- Maintain aisles of at least 3 feet width between piles.

Storage in bulk

- Bins for storing bulk AN should be kept clean and free of materials, which could contaminate the material. Bins should not be constructed of galvanized iron, copper, lead or zinc unless suitably protected. Aluminum or wooden bins should be protected against impregnation by AN.
- Piles or bins must be adequately sized, arranged and moved periodically to minimize caking. Height or depth of piles shall be limited by pressure-setting tendency of the product, but in no case should pile be higher than 36 inches below roof or supporting beams.
- Do NOT use dynamite, explosives or blasting agents to break up or loosen caked AN.
- Protect piles of AN from absorbing moisture from humid air by covering them with water- impermeable sheeting or using air conditioning.
- Do not store AN with organic chemicals, acids, or other corrosive materials, materials that may require blasting during processing or handling, compressed flammable gases, flammable and combustible materials or other contaminating substances. AN stores should be separated from incompatible substances by using separate buildings or 1 – hour fire resistant walls, or a minimum separation distance of 30 feet.

Fire Protection

- AN storage areas should be equipped with an automatic sprinkler system, or have an automatic fire detection and alarm system if the areas are not continuously occupied. This is especially important when the facility in question is close to the public surrounding the facility.
- Facilities should NOT store more than 2500 tons of bagged AN without an automatic sprinkler system.
- An automatic sprinkler system, if installed, should be provided in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems.
- Suitable fire control devices such as hoses and appropriate portable fire extinguishers (AN is an oxidizer and not all fire extinguishers are appropriate) shall be provided throughout the warehouse and loading areas. Water supplies and fire hydrants should be available.
- Store AN fertilizer in separate buildings or separated by approved fire walls from organic, combustible or reactive materials, such as grains, wood or other organic materials, urea and urea compounds, flammable liquids or gases, corrosive acids, chlorates, chromates nitrites, permanganates or finely divided metals or sulfur.AN fertilizer should NOT be stored in the same building with explosives or blasting agents unless conditions in ATF's Table of Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives and Blasting Agents, 27 CFR 555.220, are met.
- Prohibit smoking in AN storage areas.

We recommend that AN be stored in purpose-built facilities/buildings of non-combustible construction. Dust-producing organic materials, such as grain, seeds and sugar, should not be stored near AN. Some metal powders such as aluminum powder are equally dangerous. AN should be stored so as to ensure it is not contaminated by gasoline, diesel or other fuels, and is not subject to high heat (even in one small area of a large stockpile) or water infiltration.

COMMUNITY EMERGENCY PLANNING

What should communities do to understand and develop a plan for the risk associated with AN?

AN is a hazardous chemical covered under the OSHA Hazard Communication Standard. Therefore, facilities that handle and store AN are required by law to submit information regarding chemical hazards (including AN) to their State or Tribal Emergency Response Commission (SERC or TERC), Local Emergency Planning Committee (LEPC), and local fire department. This information must include the following:

1) a Safety Data Sheets (SDS) providing the chemical's hazard information and emergency response guidelines and
2) a Hazardous Chemical Inventory form that provides the quantity, storage types and locations of the AN at their facility.

We recommend that fire services visit any facility reporting AN, and that the conditions of storage and manner of handling be reviewed by fire service personnel. Fire service and other emergency responders should take note of the specific location(s), amounts and packaging of stored AN. Conditions of storage should be reviewed with the facility operator in light of the information provided in this document.

The LEPC in conjunction with the fire department should use this information to develop an emergency plan, in case of a fire or explosion involving AN or any other hazardous substance. The facility should consult with the LEPC to provide them the necessary information to develop the emergency plan, the elements of which should include:

- Identification of facilities and transportation routes of hazardous substances
- Description of emergency response procedures, on and off site
- Designation of a community coordinator and facility emergency coordinator(s) to implement the plan
- Outline of emergency notification procedures
- Description of how to determine the probable area and population affected by releases
- Description of local emergency equipment and facilities and the persons responsible for them
- Outline of evacuation plans
- A training program for emergency responders (including schedules)
- Methods and schedules for exercising emergency response plans

LEPCs should also ensure that members of the community (which would include potentially affected populations) are aware of the emergency plan and the actions they need to take if an accident occurs.

Local fire departments should use the information to determine what precautions they may need to take in responding to an accident at the facility and ensure the first responders have the appropriate training to respond to incidents involving AN.

Owners and operators of facilities holding AN are required to report the AN hazard to local response officials under the Emergency Planning and Community Right-to-Know Act (EPCRA). Unfortunately, that obligation is not universally understood, and so some facilities may fail to report. Fertilizer-grade AN is typically found at those businesses that provide direct logistical support to agriculture. This may include crop service operations, farm co-ops, grange stores and similar operations.

In the interest of community safety, it is often necessary and appropriate for first response officials to reach out to facility owners and operators, and determine if unreported risks are present in their community. Helping a neighbor, facility operator, or employer to understand and meet his obligations to the community and to workers is in everyone's best interest

EMERGENCY RESPONSE

Owner/operators of storage facilities should develop a site emergency response plan which includes:

- Coordination with local first responders
- Joint training with first responders if possible
- Employee training
- Community outreach
- Analysis of what may be at risk in a serious accident and appropriate planning
- Signs that clearly mark high hazard areas, safe areas, emergency contact numbers, firefighting equipment, and other essential area during an emergency response
- A site and area evacuation plan

Owners and operators of facilities holding AN have an obligation to ensure their community's first responders are aware of the hazards associated with the AN. Reliance on a report may not always be sufficient. Owners and operators should take a pro-active approach to reaching out to the emergency response officials in their location and ensuring that the hazards of AN are understood by the responders.

What do firefighters need to know when responding to an accident or fire involving AN?

Before responding to a fire involving AN, firefighters should ensure the community emergency response plan includes:

- AN hazard information and emergency response guidelines
- Quantity, storage types, and locations of AN at facilities in their community
- Specific response procedures; including a decision process to determine under which conditions a fire should be fought or whether the fire should be allowed to burn
- Evacuation procedures for the community
- Training requirements for all response personnel
- A schedule for exercising the response plan related to AN accidents When responding to a fire where AN is stored; firefighters should:
- First consider if they can safety fight the fire or whether they should just let it burn, move to a safe location, and focus on evacuating nearby residents and preventing further safety issues for the surrounding community.

To determine whether or not it makes sense to fight the fire or to let it burn, firefighters and emergency responders should consider the following information:

- Firefighters should not fight an AN fire and everyone, including fire fighters, should be evacuated to a safe distance if they observe any of the following:
    - A fire involving AN is judged to be out of control;
    - The fire is engulfing the AN; or
    - Brown/orange smoke is detected, indicating the presence of nitrogen dioxide (which is toxic); or
    - A rapid increase in the amount/intensity of smoke or fire in the area of AN storage.
- If firefighters consider it safe and appropriate to respond to a fire involving AN, then the following information should be considered:
    - AN fires should be fought from protected locations or maximum possible distance. Approach a fire involving or close to AN from upwind to avoid hazardous vapors and toxic decomposition products. Self-contained breathing apparatus (SCBA) of types approved by the National Institute for Occupational Safety and Health (NIOSH) should be used to protect personnel against gases.
    - Use flooding quantities of water from a distance as promptly as possible. It is important that the mass of AN be kept cool and the burning be quickly extinguished. Keep adjacent fertilizers cool by spraying with large amounts of water. When possible and appropriate, only use unmanned hose holders or monitor nozzles.
    - Do NOT use steam, CO_2, dry powder or foam extinguishers, sand or other smothering agents.
    - Ensure maximum ventilation of the AN storage container as quickly as practical to prevent heat and pressure buildup. This is different than ensuring maximum ventilation of the entire building or structure where the AN is stored. Ventilation of the structure should be conducted only in a manner to limit fire spread and growth and should be minimized until a suppression water supply is established.
    - If practicable and safe to do so, attempt to prevent AN from entering the drains where explosive confinement could occur. Remember AN may be washed into drains by fire water, but it can also melt and flow without impetus from water.
    - Prevent or minimize contamination of water bodies or streams to reduce the potential for environmental effects.

INFORMATION RESOURCES

CODES AND STANDARDS

NFPA codes and Compressed Gas Association (CGA) standards are developed through a consensus standards development process approved by the American National Standards Institute.

This process brings together volunteers representing various viewpoints and interests to achieve consensus on safety issues.

These codes and standards are not binding but may be adopted by reference into laws or regulations. Users of the codes and standards should consult applicable federal, state and local laws and regulations.

NFPA has developed a code for storage of AN, including mixtures containing 60 percent or more by weight of AN, and a code for explosives that would apply to blasting agents and explosives containing AN.

These codes are listed below:

- NFPA 400 — Hazardous Materials Code, Chapter 11 - Ammonium Nitrate Solids and Liquids. (2013). Also see Annex A.11 in this document and Annex E: Properties and Uses of Ammonium Nitrate and Fire-Fighting Procedures.
- NFPA 495 — Explosive Materials Code (2013). National Fire Protection Association

Safe Practices for the Production of Nitrous Oxide From Ammonium Nitrate, CGA G-8.4 (January 2013). Compressed Gas Association, Inc., Chantilly, VA
www.cganet.com/customer/publication_detail.aspx?id=G-8.4

GENERAL REFERENCES

Storing and Handling Ammonium Nitrate, INDG230 (First published 8/96, Reprinted 11/04). Health and Safety Executive (HSE), United Kingdom
http://www.hse.gov.uk/explosives/ammonium/

Safe Storage and Handling of Ammonium Nitrate (AN), Technical Note 60, (28/02/2006), SafeWork, South Australia. http://www.safework.sa.gov.au/uploaded_files/SSAN_Storage.T60.pdf

Safe Practice: Safe Storage of Solid Ammonium Nitrate. (2013). Resources Safety, Division of Mines and Petroleum, Government of Western Australia (WA), East Perth, WA. http://www.dmp.wa.gov.au/documents/Code_of_Practice/DGS_COP.pdf

Guidance for the Storage, Handling and Transportation of Solid Mineral Fertilizers. (2007). European Fertilizers Manufacturers Association, Brussels, Belgium, www.efma.org

Guidance for the Safe Handling and use of Non-conforming Fertilizers and Related Materials (Producers). (2003). European Fertilizers Manufacturers Association, Brussels, Belgium, www.efma.org

Guidance for the Safe Handling and Use of Non-conforming Fertilizers and Related Materials for Fertilizer Importers, Distributors and Merchants. (2004). European Fertilizers Manufacturers Association, Brussels, Belgium, www.efma.org

Guidance for the Storage of Hot Ammonium Nitrate Solution. (2005). European Fertilizers Manufacturers Association, Brussels, Belgium, www.efma.org

Guidance for Compatibility of Fertilizer Blending Materials. (2006). European Fertilizers Manufacturers Association, Brussels, Belgium, www.efma.org

The above five guidance documents from European Fertilizers Manufacturers Association can be found on the following webpage:
http://www.productstewardship.eu/site/index.php?id=259

Ammonium Nitrate and Mixed Fertilizers Containing Ammonium Nitrate, FM Global Property Loss Prevention Data Sheet 7-89. (2013). FM Global, Johnston, Rhode Island. www.fmglobal.com/page.aspx?id=04010200 Free access with registration Ammonium Nitrate Handling, (2013). Bunn Fertiliser
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Ammonium Nitrate, Nutrient Source Specific (NSS) Fact Sheet, No. 22 International Plant Nutrition Institute, Norcross, GA
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Fire Protection Guide to Hazardous Materials, 14th edition. (2010). National Fire Protection Association, Quincy, MA. Guide No. 140 for Oxidizers , Emergency Response Guidebook. 2012. US Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration.
http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/ERG2012.pdf

EPA Chemical Accident Investigation Report, Terra Industries, Inc., Nitrogen Fertilizer Facility, Port Neal, Iowa. (January, 1996). U.S. Environmental Protection Agency, Region 7, Emergency Response and Removal Branch, Kansas City, KS.
www.epa.gov/emergencies/docs/chem/cterra.pdf

West Fertilizer Explosion and Fire (2013). Chemical Safety Board www.csb.gov/west-fertilizer-explosion-and-fire-/

The National Safety Council has a data sheet Ammonium Nitrate Fertilizer, Data Sheet I-699. (1991) that discusses the health hazards, properties, and precautions for safe storage and handling of AN fertilizer. National Safety Council 1121 Spring Lake Drive Itasca, IL 60143-3201, Phone: (800) 621-7269 (toll free) or (630)-775-2199 (Library) Website: http://www.nsc.org

The Fertilizer Institute (TFI) possesses information on various fertilizer products, including AN, and their uses. The Fertilizer Institute, 425 Third Street, SW, Suite 950, Washington, DC 20024, Phone: (202) 962-0490, Website: http://www.tfi.org

ResponsibleAg (RA) is a Fertilizer Code of Practice management system that helps facilities establish basic Environmental, Health, Safety and Security (EHS&S) performance practices. ResponsibleAg is a joint venture of the Agricultural Retailers Association (ARA) and The Fertilizer Institute (TFI). ARA also has a First Responder Guidance for use by agricultural retailers, LEPCs and local first responders. For more information, contact: Agricultural Retailers Association 1156 15th Street, NW, Suite 500, Washington, D.C. 20005, Phone: 202-457-0825, Website: www.aradc.org

For more detailed information on the safe handling practices for storage of explosive materials which may contain AN, please consult the following Safety Library Publications (SLPs) developed by the Institute of Explosive Makers (IME).

- Construction Guide for Storage Magazines, IME SLP No. 1 (September 2006).
- The American Table of Distances, IME SLP No. 2 . (October 2011).
- Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials, IME SLP No. 3. (October 2009).

- Handbook for the Transportation and Distribution of Explosive Material, IME SLP No. 14. (April 2007).
- Safety in the Transportation, Storage and Use of Explosive Materials, IME SLP No. 17 (October 2011).
- Recommendations for the Transportation of Explosives, Division 1.5, Ammonium Nitrate Emulsions, Division 5.1, Combustible Liquids, Class 3, and Corrosives, and Liquids, Class 8 in Bulk Packaging, IME SLP No. 23. (October 2011).
- Explosives Manufacturing and Processing Guide to Safety Training, IME SLP No. 25. (May 2011). SLPs are available at http://www.ime.org/ecommerce/products.php?category_id=13, Institute of Makers of Explosives (IME) 1120 Nineteenth St. N.W. Suite 310, Washington, DC 20036-3605, Phone: (202) 429-9280, Website: www.ime.org

SAFEX International is an industry group whose members manufacture civil or military explosives or technical grade ammonium nitrate (TGAN).

TGAN is generally in the form of porous prills and is used in the manufacture of commercial explosives. SAFEX has published a guide for safe storage of TGAN listed below that is available to its members. https://www.safex-international.org/_index.php

Good Practice Guide: Storage of Solid Technical Grade Ammonium Nitrate. (March 2011). International Working Group on Ammonium Nitrate, SAFEX International. SAFEX Good Explosive Practice Series, GPG 02 rev. 1

STATUTES AND REGULATIONS

Statutes and regulations applicable to the manufacture of or processes involving AN, are listed below.

Clean Air Act Accident Prevention- General Duty (EPA)

Section 112(r) of the Clean Air Act (CAA) focuses on prevention of chemical accidents. Under this provision of the CAA, all facilities with regulated substances or other extremely hazardous substances have a general duty to prevent and mitigate accidental releases. Under Section 112(r)(1), the general duty is:

> to identify hazards …using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

This general duty applies to facilities producing, processing, handling or storing extremely hazardous substances.

While not a regulated substance, AN may be considered extremely hazardous under certain circumstances.

Clean Air Act- Risk Management Program (EPA) and Process Safety Management (OSHA)

In 1990, amendments to the CAA authorized the EPA's Risk Management Program (RMP) Rule (40 CFR Part 68) under section 112(r), and required OSHA to issue the Process Safety Management Program (PSM) rule. Both rules serve to prevent chemical accidents.

The RMP focuses on prevention and mitigation of accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program.

While AN is not a listed substance subject to the RMP, chemicals used in the production of AN are included on the RMP list, making the process producing AN potentially subject to the RMP. Certain processes using AN may also involve RMP listed substances. For more information about RMP regulations, see www.epa.gov/emergencies/content/rmp/index.htm

OSHA's Process Safety Management (PSM) Standard establishes requirements intended to protect employees by preventing or minimizing the consequences of chemical accidents involving highly hazardous chemicals (29 CFR 1910.119).

Although AN is not covered by the PSM standard, the production or use of AN may involve PSM listed chemicals in excess of thresholds. Manufacture of explosives, which may involve AN, is also covered by the PSM standard. For more information about OSHA's PSM standard see www.osha.gov/SLTC/processsafetymanagement/index.html

Emergency Planning and Community Right-to-Know Act (EPA)

The Emergency Planning and Community Right-to-Know Act (EPCRA), requires information on the presence of hazardous chemicals above designated threshold quantities at regulated facilities be provided to state and local emergency planning authorities. This information facilitates development of emergency response plans required by section 303 of EPCRA, enhances community awareness of chemical hazards and help first responders to respond to chemical accidents. The chemicals covered under these requirements are a specific list of chemicals known as Extremely Hazardous Substances (EHSs) found at 40 CFR Part 355 Appendices A and B and any chemicals that meet the criteria as hazardous chemicals under OSHA's Hazard Communication Standard. AN is not an EHS but is considered a hazardous chemical (oxidizer) and therefore subject to the EPCRA provisions described below.

Section 311 of EPCRA requires facilities to submit Safety Data Sheets for the EHSs and hazardous chemicals to their State or Tribal Emergency Response Commission (SERC or TERC), Local Emergency Planning Committee (LEPC) and local fire department. Section 312 requires facilities to submit annually to their SERC or TERC, LEPC, and local fire department, Hazardous Chemical Inventory forms for these chemicals. The SDS provides the chemical's hazard information and emergency response guidelines and the Hazardous Chemical Inventory form provides the quantity, storage types and locations of the chemical at their facility. Regulations covering these requirements are found at 40 CFR Part 370.

Section 311(e)(5) of EPCRA does not include the following as a hazardous chemical: any substance used in routine agricultural operations or a fertilizer held for sale by a retailer to the ultimate customer. At fertilizer distributors, AN is commonly blended with other chemicals to produce a fertilizer mix according to customer specifications. Any AN that is mixed or formulated with other chemicals by facilities is not covered by the Section 311(e)(5) exemption.

The exemption was intended to apply only to retailers of the substance, not to manufacturers and wholesalers – who typically have large quantities of fertilizers, and may use and manufacture a wide range of chemical compounds. These manufacturers and wholesalers can present significant risks that need to be addressed by emergency response authorities. For more information about EPCRA hazardous chemical reporting, see http://www.epa.gov/emergencies/content/epcra/index.htm

Environmental Protection Agency (EPA) Phone: (800) 424-9346 or (703) 412-9810 Website: http://www.epa.gov

Explosives and Blasting Agents Standards (OSHA)

In addition to the PSM program described above, the Occupational Safety and Health Administration (OSHA) regulates the manufacture, keeping, having, storage, sale, transportation, and use of explosives and blasting agents under its Occupational Safety and Health Standards for explosives and blasting agents (29 CFR 1910.109). Blasting agents are frequently formulated with AN. For more information about OSHA's standards covering explosives and blasting agents, including ammonium nitrate and storage of all grades of ammonium nitrate, see https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9755&p_table=STANDARDS

Hazard Communication Standard (OSHA)

OSHA's Hazard Communication Standard (HCS) at 29 CFR 1910.1200 requires chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import, and prepare labels and Safety Data Sheets (SDS) to convey the hazard information to their downstream customers. All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately. AN is a hazardous chemical covered under the HCS. The HCS is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Employers are required to train workers by December 1, 2013 on the new labels elements and safety data sheets format to facilitate recognition and understanding. For more information, see http://www.osha.gov/dsg/hazcom/index.html

Occupational Safety and Health Administration Phone: (800) 321- OSHA (6742) Website: http://www.osha.gov

Chemical Facility Anti-Terrorism Standards (DHS)

The Department of Homeland Security (DHS)'s Chemical Facility Anti-Terrorism Standards (CFATS) program applies to facilities that possess threshold quantities of certain types of ammonium nitrate. Facilities in possession of Chemicals of Interest (listed in 6 CFR Part 27 Appendix A) exceeding specific threshold quantities are required to complete a "Top-Screen" questionnaire to identify the types and quantities of Chemicals of Interest the facility possesses. For ammonium nitrate at any concentration (with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance) the Screening Threshold Quantity for risk of release is 5,000 pounds and for risk of theft is 400 pounds.

This same form of ammonium nitrate is also classified by DOT as a Division 1.1 explosive. For solid ammonium nitrate, with a minimum concentration of 33% or greater and a nitrogen concentration of 23% nitrogen or greater, the Screening Threshold Quantity for risk of theft is 2,000 pounds. The CFATS program, first established under Section 550 of the 2007 DHS Appropriations Act, identifies and regulates high-risk chemical facilities to ensure they have security measures in place to reduce the risks associated with these chemicals. CFATS regulations are found in 6 CFR Part 27.

Based on the Top-Screen, if DHS initially determines the facility to be high-risk, the facility must complete and submit a Security Vulnerability Assessment, which is then reviewed by DHS to make a final determination on whether the facility is high-risk. Facilities receiving a final high-risk determination must develop and submit for DHS's review, a Site Security Plan (SSP), or alternatively, an Alternative Security Program, that describes the specific security measures the facility will utilize to meet the 18 applicable risk-based performance standards under CFATS. The agency must then conduct an inspection to help determine whether or not the facility's SSP should be approved. For more information about CFATS program, see http://www.dhs.gov/chemical-facility-anti-terrorism-standards

Hazardous Materials (DOT)

The Department of Transportation (DOT) regulates transportation of AN under its Hazardous Materials Regulations.

The following forms of ammonium nitrate are listing in the DOT Hazardous Materials Table (49 CFR 172.101) with their Hazard Class or Division:

- Ammonium nitrate based fertilizer, 5.1
- Ammonium nitrate based fertilizer, 9 (when transported by vessel or aircraft)
- Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel, intermediate for blasting explosives, 5.1
- Ammonium nitrate-fuel oil mixture containing only prilled ammonium nitrate and fuel oil, 1.5D Ammonium nitrate, liquid (hot concentrated solution), 5.1
- Ammonium nitrate, with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance, 1.1D Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance, 5.1

Explanation of Hazard Class numbers:

- 1.1 - Explosives (with a mass explosion hazard) A mass explosion is one which affects almost the entire load instantaneously.
- 1.5 - Very insensitive explosives; blasting agents
- 5.1 - Oxidizer
- 9 - Miscellaneous Hazard Material

DOT also requires security plans for persons offering for transportation or transporting any quantity of a Division 1.1 or 1.5 material containing ammonium nitrate or large bulk quantities (greater than 6,614 lbs or 792 gals) of ammonium nitrate, ammonium nitrate fertilizers, or ammonium nitrate emulsions, suspensions, or gels. The security plan must conform to requirements in 49 CFR 172.800. Department of Transportation, Phone: (202) 366-5580 - Public Information Website: http://www.dot.gov

Explosives Regulations (ATF)

The Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) of the Department of the Justice regulates the importation, manufacture, distribution, and storage of explosive materials including blasting agents and other explosive materials containing AN. ATF's explosives regulations, 27 CFR Part 555, can be located at www.atf.gov/regulations-rulings/regulations/index.html Bureau of Alcohol, Tobacco, Firearms, and Explosives Phone: (202) 648-7120 Website: http://atf.gov

For More Information, Contact:

The Superfund, TRI, EPCRA, Risk Management Program, and Oil Information Center
(800) 424-9346 or (703) 412-9810

CHEMICAL ADVISORY: Safe Storage, Handling, and Management of Ammonium Nitrate Prills

HOME

INTRODUCTION

The Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) ("we") issue this advisory as part of an ongoing federal effort to improve chemical risk management, advance ammonium nitrate safety, and protect human health and the environment. This advisory contains information on incidents involving ammonium nitrate (NH4NO3 - commonly referred to as "AN"), AN hazards, hazard management, and steps for emergency planning, and safe emergency response.

The U.S. Department of Transportation (DOT) classifies solid AN prills (i.e., small beads) containing no more than 0.2 percent combustible substances as a Division 5.1 oxidizer. There are two commercial forms of prills: (1) "technical grade" (TGAN) used in the manufacture of blasting agents, and (2) "fertilizer grade" (FGAN) used as a fertilizer or in fertilizer blends. The only difference between TGAN and FGAN is the density of the prills. TGAN has lower density to better retain additives used to produce blasting agents. The two forms are chemically identical and present the same hazards when involved in fires.

This advisory is meant to apply to both grades of AN prills and to all facilities and persons managing or using the material for any purpose. The advisory also provides a list of information resources, including relevant codes and standards, industry publications, and applicable statutes and regulations to help facilities safely handle AN, and emergency responders better understand AN hazards so they can effectively manage the associated risks.

The information provided is not intended to cover all hazards, safe practices or technical challenges associated with the manufacturing of AN; the manufacturing, storage or use of explosives5 or blasting agents containing AN; or the transportation of AN and AN containing products. For these situations, please consult other sources including the appropriate references, standards, and regulations cited at the end of this document.

INCIDENTS

Incidents involving AN are rare, considering that the United States uses millions of tons of AN annually. Yet, as described below, they can have severe consequences. Pure AN is stable at ambient temperature and pressure. While the chemical itself does not burn, AN supports and accelerates the combustion of organic (and some inorganic) material, increasing the fire hazard and complicating firefighting challenges. AN may explode when exposed to a strong shock or when subjected to sustained high temperatures in confinement.

On April 17, 2013, a fire at an AN storage and distribution facility in West, Texas, resulted in a detonation of FGAN stored at the facility, killing 15, including some of the firefighters responding to the fire. The explosion injured more than 250 and caused extensive damage to nearby homes, businesses, and schools. This incident remains under investigation, but preliminary CSB findings and separate investigations of the emergency response activities by the Texas State Fire Marshal and National Institute of Occupational Safety and Health (NIOSH) indicate that factors contributing to the incident include:

- Large, wooden (combustible) commercial structure
- Storage of combustible and sensitizing materials near AN storage piles
- Poor awareness of explosion hazards leading to inappropriate firefighting strategy and tactics
- Limited or no pre-incident emergency planning
- Lack of incident management system for emergency responders
- No community emergency plan involving AN

> In general, the conditions of AN storage are crucial to the safety and stability of the AN. Materials co-located or stored with AN may play a role in its sensitivity to explosion.

Much has been learned from other AN explosions:

- On September 21, 2001, an enormous explosion occurred in a warehouse at the Azote de France fertilizer factory in Toulouse, France, involving between 200 and 300 tons of bulk FGAN stored in a hangar. The explosion resulted in 30 deaths, 2500 injuries, the destruction of the factory, and heavy damage to about 10,000 off-site buildings. The exact cause of this incident remains unknown. Storage of incompatible material with AN may have been a factor.
- On October 2, 2003, a fire and explosion occurred in a two-story farm warehouse in St. Romain en Jarez, France, involving 3 to 5 tons of FGAN stored in bags. This incident injured 26, including 18 firefighters. In this incident, improper storage methods possibly played a role.

Explosions of stored AN are responsible for some of the worst chemical disasters on record. Several of these incidents, including two in Germany in 1921, occurred during attempts to break up large piles of solidified or caked AN or AN/ammonium sulfate mixtures using explosives. In both cases, the initial blast intended to break up solid AN or AN/ammonium sulfate mixtures initiated an unintended detonation of the materials.

In another incident, fires involving AN in confined spaces triggered large explosions. In 1947 in Texas City, Texas, two cargo ships carrying AN intended for use as a fertilizer caught fire and exploded. In that case, the first ship is thought to have exploded due to a fire in the cargo hold involving AN that had been manufactured with a wax coating and stored in paper bags. The wax was one potential source of fuel that could have reacted with the AN, creating an explosive situation. The second ship exploded some time later, likely due to a fire caused by the first explosion. These two explosions resulted in deaths of nearly 600, including all but one member of the Texas City Fire Department.

Because of such incidents and subsequent studies of the properties of AN, caked AN is no longer broken up with explosive materials, and organic materials, such as paraffinic wax, are no longer used to coat AN prills.

The incidents described above led to the development of important AN safety principles. The safe practices in this advisory should become normal practices for all businesses handling, storing, manufacturing, or blending AN.

- Piles of AN can compress/consolidate or cake under some conditions. Never use explosives to break-up caked or consolidated AN deposits.
- AN is at risk for explosion when stored near materials that can add fuel to the AN (see section on Contamination)
- AN is a powerful oxidizer and a rich source of nitrate, which provides energy to an explosion. Thus, the presence of fuel and/or heat (and especially both) near AN is a very high hazard situation.

AMMONIUM NITRATE HAZARD INFORMATION

Hazard Classification

DOT classifies AN (both FGAN and TGAN) as a Division 5.1 oxidizer if it contains not more than 0.2 percent combustible substances, or, if it is an AN fertilizer blend, if it contains not more than 0.4 percent combustible substances. See the last section for detailed DOT ammonium nitrate hazard classifications.

The National Fire Protection Association (NFPA) assigns solid oxidizers to Class 1, Class 2, Class 3, or Class 4 where Class 4 is the most oxidizing. AN is a Class 2 oxidizer. NFPA also assigns AN an instability rating of 3 (in a range of 0-4 with 4 being the most unstable) to alert emergency responders that AN is capable of detonation, explosive decomposition, or explosive reaction when exposed to a strong initiating source or when confined at high temperature. AN explosions occur more readily when fuels or sensitizing contaminants are present.

Decomposition Chemistry

AN does not burn, but melts and begins to undergo decomposition at 337° F (170° C). Decomposition creates toxic gases containing ammonia and nitrogen oxides, and heat. The resulting nitrogen oxides can support combustion, even in the absence of other sources of oxygen. When confined, the heat and gases cannot dissipate. As the pressure and temperature rise the rate of decomposition increases and may cause an explosion.

During a fire in a facility where AN is present, the AN may melt and decompose making the material more sensitive to shock and detonation. In large AN piles, localized areas of high temperature may be sufficiently confined by the mass of material to initiate an explosion. The explosion of a small quantity of AN in a confined space (e.g., a pipe) may act to initiate an explosion of larger nearby quantities.

Shock sensitivity may be further increased if the AN is contaminated with incompatible materials.

"Pure" solid ammonium nitrate is fairly stable and will explode only under extreme conditions.

However, the addition of combustible contaminants, even in low percentages, creates a dangerous combination and the ammonium nitrate mixture becomes far more susceptible to detonation. Avoiding ammonium nitrate contamination underlies many of the recommendations for safe handling contained in this advisory.

Contaminants

AN mixed with a fuel, such as oil9 may detonate when exposed to fire or shock. Organic materials (e.g., packing materials, seed, etc.) will increase the likelihood of an explosion and will make the AN explosion more energetic.

Certain inorganic contaminants, including chlorides and some metals, such as aluminum powder, chromium, copper, alloys of copper, cobalt, and nickel can sensitize AN making it more likely to detonate.

AN prills readily absorb moisture, which can lead to caking, self-compression, and self-confinement. This compression and confinement increases the likelihood of detonation during a fire.

Manufacturers can combine AN with ammonium sulfate or with carbonate materials to reduce the risk of explosion in common industrial and agricultural storage and handling applications. More information on additives is discussed in Guidance for the Storage, Handling and Transportation of Solid Mineral Fertilizers, listed in the Reference section.

Solid fertilizers may be coated with an inorganic, non-combustible anti-caking compound to prevent sticking and clumping.

In general, fertilizer blends with larger percentages of AN pose a greater explosion hazard. Blended fertilizers containing AN and chloride compounds, and blended fertilizers containing AN contaminated with combustible materials or incompatible substances pose increased explosion hazards.

A large number of blended fertilizers are produced from AN mixed with rock phosphate, and/or potassium chloride or other materials which can introduce contaminants.

Individual components of fertilizer blends are not necessarily compatible with each other and some may produce undesirable effects when mixed. These undesirable effects can include chemical reaction(s) and physical effects (e.g. stickiness, which can cause handling difficulties, or moisture migration giving rise to caking tendencies). Users of these products can consult Guidance for Compatibility of Fertilizer Blending Materials listed in the Reference section to assess potential incompatibility.

The Safety Data Sheet (SDS) (formerly "MSDS" or Material Safety Data Sheet) of the AN product should be used as one source of information to assess the overall hazard. The effects of added components can only be determined after careful review of the SDS and other available hazard literature.

The addition of contaminants or otherwise incompatible materials to AN creates a danger of explosion. Confinement and the addition of heat to contaminated AN can lead to disaster.

HAZARD REDUCTION

Storage/Process Conditions to Avoid

Persons engaged in the handling, storage, movement, and management of AN must be aware of the material's hazards and work to avoid conditions that lead to explosions. Measures that facility owner/operators should take include:

- Avoid heating AN prills in a confined space.
  - Avoid localized heating of AN, potentially leading to development of high temperature areas. For example, AN should not be stored near sources of heat such as steam pipes, radiators, hot ducts, light bulbs, etc.
- Ensure that AN is not exposed to strong shock waves from explosives. AN storage near high explosives or blasting agents must conform to ATF's Table of Separation Distances. 27 CFR 555.220.10
  - Do not use explosives to break-up caked or consolidated AN deposits.
- Avoid contamination of AN with combustible materials or organic substances such as packing materials, dust, seed, oils, and waxes. 29 CFR 1910.109(i)(5)(i)(a).
  - If possible, do not co-locate AN, especially bulk AN in bins, with dust-producing organics such as grains or seeds without a firewall or a separation distance of at least 30 feet.
  - See the advisory's Contaminants section for additional information.
- Avoid contamination of AN with inorganic materials that may contribute to its sensitivity to explosion, including chlorides and some finely divided metals, such as aluminum powder, chromium, copper, alloys of copper, cobalt, and nickel. 29 CFR 1910.109(i)(5)(i)(a).
  - Use care in selecting the materials used to build storage areas, bins and cribs. Metal or concrete construction is preferred. Wood used for bins must be specially treated to prevent impregnation. 29 CFR 1910.109(i)(4)(ii)(b). Metal materials that can corrode should be coated to prevent corrosion.
  - See the advisory's Contaminants section for additional information.

Additional safety and handling instructions apply for safe handling and storage of AN under certain conditions:

- OSHA's standard at 29 CFR 1910.109(i) contains requirements for AN stored in the form of crystals, flakes, grains or prills including FGAN, nitrous oxide grade, TGAN, and other mixtures containing 60 percent or more of AN by weight.
- NFPA 400 - 2016 Hazardous Materials Code, Chapter 11 contains comprehensive information on AN hazards and hazard mitigation techniques.

Building Design

- Store only in one-story buildings and buildings with no basements, unless the basement is open on at least one side. 29 CFR 1910.109(i)(2)(iii)(a). Non-combustible construction is strongly preferred.
- Use fire resistant walls within 50 feet of combustible building or materials. 29 CFR 1910.109(i)(2)(iii)(c).
- Use noncombustible flooring in storage and handling areas or protect flooring from AN impregnation. 29 CFR 1910.109(i)(2)(iii)(d).
- Use floors with no open drains, traps, tunnels, pits or pockets into which solid or molten AN could settle or flow and be confined in the event of fire. 29 CFR 1910.109(i)(2)(iii)(d).
- Keep buildings dry and free of water seepage through roofs, walls and floors. 29 CFR 1910.109(i)(2)(iii)(f).
- Ventilate buildings or construct buildings to self-ventilate in the event of a fire to avoid pressurization. 29 CFR 1910.109(i)(2)(iii)(b) and 29 CFR 1910.109(i)(4)(i)(a).

- Place AN into storage only when the temperature of the product is 130°F (54.4°C) or below. 29 CFR 1910.109(i)(3)(ii)(a) and (4)(iii)(c).
- Ensure that all electrical components/systems are in compliance with the National Electrical Code.
- All facility access points should be posted with a durable, reflective warning sign at least 4 ft. x 4 ft. where it is visible to emergency responders and police. The warning sign text and important hazard information should state, at a minimum: "WARNING: Do not fight fires at this facility without consulting the facility operator. Refer to DOT ERG Guide 140 and Safety Data Sheet (SDS). In case of emergency CALL 9-1-1 or (insert local emergency response number) and the facility owner/operator."
- Bins where AN is stored should be marked with a hazard rating "fire diamond" meeting the standards of NFPA 704. Place the NFPA fire diamond, with concurrence of the authority having jurisdiction, where it is clearly visible to emergency responders, police, or other individuals attempting to access the area.
- The NFPA diamond codes for AN are generally recognized to be:
  - Health Hazard (Blue)…..1
  - Flammability (Red)……..0
  - Reactivity (Yellow)………3
  - Other…………………………..(OX)

Storage in bags, drums or other containers

- Piles of bags, drums and other containers should be no closer than 36 inches below the roof or supporting beams. 29 CFR 1910.109(i)(3)(ii)(c)
- Bags should be stored no less than 30 inches from walls or partitions. 29 CFR 1910.109(i)(3)(ii)(b)
- Piles of bags, drums, and other containers should not exceed a height of 20 feet, width of 20 feet, and length of 50 feet, unless the building is of noncombustible construction or protected by automatic sprinklers. 29 CFR 1910.109(i)(3)(ii)(c)
- Aisles should be at least 3 feet wide between piles. 29 CFR 1910.109(i)(3)(ii)(d)

Storage in bulk

- Bins for storing bulk AN should be kept clean and free of contaminants. Bins should not be constructed of galvanized iron, copper, alloys of copper, lead, or zinc unless suitably protected. Aluminum or wooden bins should be protected against impregnation by AN. 29 CFR 1910.109(i)(4)(ii)(a) and (4)(ii)(b)
- Piles must be adequately sized and materials stored in bins must be moved periodically to minimize caking. 29 CFR 1910.109(i)(4)(iii)(a). Height or depth of piles shall be limited by pressure-setting tendency of the product, but in no case should pile be higher than 36 inches below roof or supporting beams. 29 CFR 1910.109(i)(4)(iii)(b)
- Dynamite, explosives, or blasting agents shall NOT be used to break up or loosen caked AN. 29 CFR 1910.109(i)(4)(iii)(d)
- Protect piles of AN from absorbing moisture from humid air by covering them with water- impermeable sheeting or using air conditioning.
- Store AN away and isolated from possible contaminants. AN stores should be separated from incompatible substances by using separate buildings, 1-hour fire resistant walls, or a minimum separation distance of 30 feet. 29 CFR 1910.109(i)(5)(i)(a)
- The contents of each bin should be clearly identified by the proper shipping name of the material, "AMMONIUM NITRATE" written in 2-inch high, capital letters below the NFPA fire diamond (see above).

AN is safest when stored in facilities/buildings of non-combustible construction, separated from potential contaminants, and not subject to high heat (even in a small area of a large stockpile) or to water infiltration.

Fire Protection

- Facilities constructed of combustible materials should have an automated water based sprinkler system and a fire detection system which should automatically activate a local audible and visual alarm system to notify occupants.
- Automatic sprinkler systems, if installed, should be in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems. 29 CFR 1910.109(i)(7)(i).
- Suitable fire control devices such as hoses and appropriate portable fire extinguishers (AN is an oxidizer and not all fire extinguishers are appropriate) shall be provided throughout the warehouse and loading and unloading areas. A source of water for firefighting and/or fire hydrants should be available to fight fires not in contact with the AN. 29 CFR 1910.109(i)(7)(ii)(a) and (b).
- Store AN in separate buildings or separated by approved fire walls from organic, combustible or incompatible materials. 29 CFR 1910.109(i)(7)(ii)(a).
- Unless meeting the requirements of ATF's Table of Separation Distances of Ammonium Nitrate and Blasting Agents from Explosives and Blasting Agents, 27 CFR 555.220, DO NOT store AN in buildings also storing explosives or blasting agents. 29 CFR 1910.109(i)(5)(ii)(b) and (c).
- Prohibit smoking in AN storage areas.

Owners and operators of facilities holding AN should ensure that emergency responders are aware of the hazards associated with the AN. Reliance on a report may not always be sufficient. It is recommended that owners and operators should take a pro-active approach to reach out to their local emergency response officials and ensure that the hazards of AN and relevant characteristics of the facility are understood by responders.

PRE-INCIDENT AND EMERGENCY ACTION PLANNING

Facility

AN is a hazardous chemical covered under the OSHA Hazard Communication Standard. Facilities handling and storing AN must submit information regarding chemical hazards (including AN) to their State or Tribal Emergency Response Commission (SERC or TERC), Local Emergency Planning Committee (LEPC), and local fire department in accordance with the Emergency Planning and Community Right-to-Know Act (EPCRA).
Facilities regulated under EPCRA must submit the following:

- SDS providing the chemical's hazard information and emergency response guidelines (EPCRA Section 311 and 40 CFR 370) and
- A Hazardous Chemical Inventory form that provides, among other things, the quantity, storage types, and locations of the AN at their facility (facilities handling FGAN do not qualify for the EPCRA "routine agricultural activity" exemption). (EPCRA Section 312 and 40 CFR 370).

Owner/operators of storage facilities should develop a site emergency response plan which includes, for example:

- Coordination with local emergency responders
- Joint training with emergency responders if possible
- Employee training
- Community and LEPC outreach
- Analysis of what may be at risk in a serious accident and appropriate planning, including explosion, exposure to toxic gases, and exposure to local populations
- Signs that clearly mark high hazard areas, safe
- areas, emergency contact numbers, firefighting equipment, and other essential areas during an emergency response
- A site and area evacuation plan

For more information on EPCRA, see http://www2.epa.gov/epcra

Fire services should regularly visit any facility reporting AN and review the conditions of storage and manner of handling compared to the practices described in this advisory. Fire service and other emergency responders should develop a pre-incident plan and make note of the specific location(s), amounts and packaging of stored AN. Conditions of storage should be reviewed with the facility operator in light of the information provided in this document.

Emergency Responders

Fire departments should ensure the pre-incident plan includes:

- AN hazard information and emergency response guidelines
- Potential muster point and incident command post location remote from the facility
- Quantity, storage types, and locations of AN at facilities in their community
- Specific response procedures; including a decision process to determine under which conditions a fire should be fought or whether the fire should be allowed to burn
- Evacuation procedures for the community
- Training requirements for all response personnel
- A schedule for exercising the response plan related to AN accidents

Local fire departments should use the information to determine what precautions they may need to take in responding to an accident at a facility and ensure emergency responders have the appropriate training to respond to incidents involving AN.

Community

The LEPC, in conjunction with the fire department, should use the pre-incident plan to develop a community emergency response plan, in case of a fire or explosion involving AN or any other hazardous substance. The facility should consult with the LEPC and local responders to provide the necessary information to help develop the community emergency response plan (see www2.epa.gov/epcra/local-emergency-planning-committees). The elements should include:

- Identification of facilities and transportation routes of hazardous substances
- Description of emergency response procedures, on- and off-site
- Designation of a community coordinator and facility emergency coordinator(s) to implement the plan
- Outline of emergency notification procedures
- Description of how to determine the probable area and population affected by releases

- Description of local emergency equipment and facilities and the persons responsible for them
- Outline of evacuation plans
- A training program for emergency responders (including schedules)
- Methods and schedules for exercising emergency response plans

Owners and operators of facilities holding AN are required to report the AN hazard to local response officials in accordance with EPCRA. Unfortunately, that obligation is not universally understood, and so some facilities may fail to report. AN is typically found at those businesses that provide direct logistical support to agriculture.

This may include crop service operations, farm co-ops, grange stores, and similar operations. Although there is an exemption from SDS and Hazardous Inventory reporting for fertilizer held for sale by a retailer to the ultimate customer, agricultural retail facilities that mix AN are not exempted from hazardous chemical inventory reporting.

In the interest of community safety, it is necessary and appropriate for emergency response officials to reach out to AN storage facility owners and operators to determine if unreported risks are present in their community. Helping a neighbor, facility operator, or employer to understand and meet their obligations to the community and to workers is in everyone's best interest.

EMERGENCY RESPONSE

When responding to a fire at a facility where AN is stored; it is critical for firefighters to approach the facility with an accurate and up-to-date pre-incident plan.

The plan should include information on the construction and layout of the structure involved, especially the AN storage location and quantities.

Incident commanders, fire captains, and responders familiar with the facility's pre-incident plan should first consider if they can safely fight the fire or if AN involvement makes this approach too hazardous.

If responders confirm or suspect AN involvement, incident command and responders should move to a safe location.

Once at a safe location, responders should focus efforts on evacuating nearby residents and preventing further hazards for the surrounding community.

- If firefighters consider it safe and appropriate to attack a fire that does not involve AN, then appropriate actions must be taken to prevent the AN from becoming involved in the fire.
- Water is the only satisfactory extinguishing agent for attacking small fires involving AN and large quantities should be applied as quickly as possible to prevent heat exposure to the AN. The following information should be considered when attacking small fires involving AN:
  - Apply flooding quantities of water to the AN pile from a distance as promptly as possible. It is important that the mass of AN be kept cool and that melting and decomposition be prevented. Keep adjacent fertilizers cool by spraying with large amounts of water. When possible and appropriate, only use unmanned hose holders or monitor nozzles.
  - Use only water as other extinguishing and smothering agents are ineffective.
  - If practicable and safe, attempt to prevent AN from entering the drains where explosive confinement could occur. Remember AN may be washed into drains by fire water, but it can also melt and flow without impetus from water.
  - Prevent or minimize contamination of water bodies or streams to reduce the potential for environmental effects.
- Firefighters should always follow the facility pre-plan and not fight an AN facility fire if the AN storage is engaged. Everyone, including fire fighters, should be evacuated to a safe distance if they observe any of the following:
  - The fire is impacting the AN storage area; or
  - Brown/orange smoke is detected, indicating the presence of nitrogen dioxide, which is a toxic byproduct of AN fire exposure and decomposition; or
  - There is a rapid increase in the amount/intensity of smoke or fire in the area of AN storage.
- When evacuation is deemed necessary, fire-fighting personnel should immediately evacuate the area within 1 mile (or the distance as determined by the Emergency Response Plan) in all directions.

STATUTES AND REGULATIONS

Statutes and regulations applicable to the manufacture of or processes involving AN, are listed below.

Clean Air Act Accident Prevention- General Duty (EPA)

Section 112(r) of the Clean Air Act (CAA) focuses on prevention of chemical accidents.

Under this provision of the CAA, all facilities with regulated substances or other extremely hazardous substances have a general duty to prevent and mitigate accidental releases.

Under Section 112(r)(1), the general duty is:

> to identify hazards …using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

This general duty applies to facilities producing, processing, handling or storing extremely hazardous substances. While not a regulated substance, AN may be considered extremely hazardous under certain circumstances.

Emergency Planning and Community Right-to-Know Act (EPA)

The Emergency Planning and Community Right-to-Know Act (EPCRA), requires information on the presence of hazardous chemicals above designated threshold quantities at regulated facilities be provided to state and local emergency planning authorities.

This information facilitates development of emergency response plans required by section 303 of EPCRA, enhances community awareness of chemical hazards and helps emergency responders to respond to chemical accidents. The chemicals covered under these requirements are a specific list of chemicals known as Extremely Hazardous Substances (EHSs) found at 40 CFR Part 355 Appendices A and B and any chemicals that meet the criteria as hazardous chemicals under OSHA's Hazard Communication Standard. AN is not an EHS but is considered a hazardous chemical (oxidizer) and therefore subject to the EPCRA provisions described below.

Section 311 of EPCRA requires facilities to submit Safety Data Sheets for the EHSs and hazardous chemicals to their State or Tribal Emergency Response Commission (SERC or TERC), Local Emergency Planning Committee (LEPC) and local fire department. Section 312 requires facilities to submit annually to their SERC or TERC, LEPC, and local fire department, Hazardous Chemical Inventory forms for these chemicals. The SDS provides the chemical's hazard information and emergency response guidelines and the Hazardous Chemical Inventory form provides the quantity, storage types and locations of the chemical at their facility. Regulations covering these requirements are found at 40 CFR Part 370.

Section 311(e)(5) of EPCRA does not include the following as a hazardous chemical: any substance used in routine agricultural operations or a fertilizer held for sale by a retailer to the ultimate customer. At fertilizer distributors, AN is commonly blended with other chemicals to produce a fertilizer mix according to customer specifications.

Any AN that is mixed or formulated with other chemicals by facilities is not covered by the Section 311(e)(5) exemption. The exemption was intended to apply only to retailers of the substance, not to manufacturers and wholesalers – who typically have large quantities of fertilizers, and may use and manufacture a wide range of chemical compounds.

These manufacturers and wholesalers can present significant risks that need to be addressed by emergency response authorities. For more information about EPCRA hazardous chemical reporting, see http://www.epa.gov/emergencies/content/epcra/index.htm. Environmental Protection Agency (EPA) Phone: (800) 424-9346 or (703) 412-9810 Website: http://www.epa.gov

Ammonium Nitrate Safety Standards (OSHA)

OSHA's standard at 29 CFR 1910.109(i) contains requirements for AN stored in the form of crystals, flakes, grains or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade, and other mixtures containing 60 percent or more of AN by weight. For more information see www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9755

Explosives and Blasting Agents Standards (OSHA)

OSHA regulates the manufacture, keeping, having, storage, sale, transportation, and use of explosives and blasting agents under its Occupational Safety and Health Standards for explosives and blasting agents (29 CFR 1910.109). Blasting agents are frequently formulated with AN. For more information about OSHA's standards covering explosives and blasting agents, including AN and storage of all grades of AN, see www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9755.

Hazard Communication Standard (OSHA)

OSHA's Hazard Communication Standard (HCS) at 29 CFR 1910.1200 requires chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import, and prepare labels and Safety Data Sheets (SDS) to convey the hazard information to their downstream customers. All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately. AN is a hazardous chemical covered under the HCS.

The HCS is now aligned with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). All hazardous chemicals shipped by manufacturers and importers after June 1, 2015 must be labeled according to GHS requirements. [Distributors may continue to ship containers labeled by manufacturers or importers in compliance with the HazCom 1994 standard until December 1, 2015.] Employers are required to train workers on the new labels elements and safety data sheets format to facilitate recognition and understanding. For more information, see http://www.osha.gov/dsg/hazcom/index.html

Occupational Safety and Health Administration Phone: (800) 321- OSHA (6742) Website: http://www.osha.gov

Facilities located within one of the 27 OSHA State Plans should contact their State Plan office for the specific requirements in their state, which may differ but must be at least as effective OSHA standards. OSHA also provides help to employers. OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. For more information or for additional compliance assistance, contact OSHA at 1-800-321-OSHA (6742).

Chemical Facility Anti-Terrorism Standards (DHS)

The Department of Homeland Security's (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) program applies to facilities that possess threshold quantities of certain types of ammonium nitrate. Facilities in possession of Chemicals of Interest (listed in 6 CFR Part 27 Appendix A) meeting or exceeding specific threshold quantities are required to complete a "Top-Screen" questionnaire to identify the types and quantities of Chemicals of Interest the facility possesses. CFATS regulates facilities that possess two forms of AN.

The first is a form with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance. The second is ammonium nitrate in solid form, with a minimum nitrogen concentration of 23%, or any mixture containing 33% solid ammonium nitrate or greater. The CFATS program, authorized by P.L. 113-254, the Protecting and Securing Chemical Facilities from Terrorist Attacks Act of 2014, identifies and regulates high-risk chemical facilities to ensure they have security measures in place to reduce the risks associated with these chemicals. CFATS regulations are found in 6 CFR Part 27.

Based on the Top-Screen, if DHS initially determines the facility to be high-risk, the facility must complete and submit a Security Vulnerability Assessment, which is then reviewed by DHS to make a final determination on whether the facility is high-risk.

Facilities receiving a final high-risk determination must develop and submit for DHS's review, a Site Security Plan (SSP), or alternatively, an Alternative Security Program, that describes the specific security measures the facility will utilize to meet the 18 applicable risk-based performance standards under CFATS.

The agency must then review the facility's SSP to determine if it should be approved. For more information about CFATS program, see http://www.dhs.gov/chemical-facility-anti-terrorism-standards.

Handling of Dangerous Cargo in Waterfront Facilities (USCG)

The U.S. Coast Guard (USCG) regulates the handling and storage of AN in waterfront facilities. For more information, see 33 CFR 126.

Hazardous Materials (DOT)

The Department of Transportation (DOT) regulates transportation of AN under its Hazardous Materials Regulations. For more information see 49 CFR Subchapter C.

The following forms of ammonium nitrate are listed in the DOT Hazardous Materials Table (49 CFR 172.101) with their Hazard Class or Division and identification number assigned to each proper shipping name:

- Ammonium nitrate based fertilizer, Division 5.1, UN2067
    - Special Provisions Code 150 - This description may be used only for uniform mixtures of fertilizers containing ammonium nitrate as the main ingredient within the following composition limits:
        - Not less than 90% ammonium nitrate with not more than 0.2% total combustible, organic material calculated as carbon, and with added matter, if any, that is inorganic and inert when in contact with ammonium nitrate; or
        - Less than 90% but more than 70% ammonium nitrate with other inorganic materials, or more than 80% but less than 90% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate, and not more than 0.4% total combustible, organic material calculated as carbon; or
        - Ammonium nitrate-based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45% but less than 70% ammonium nitrate, and not more than 0.4% total combustible, organic material calculated as carbon such that the sum of the percentage of compositions of ammonium nitrate and ammonium sulphate exceeds 70%.
- Ammonium nitrate based fertilizer, Class 9, UN2071 (when shipped by air or water)
    - Special Provisions Code 132 - This entry may only be used for uniform, ammonium nitrate based fertilizer mixtures, containing nitrogen, phosphate or potash, meeting the following criteria: (1) Contains not more than 70% ammonium nitrate and not more than 0.4% total combustible, organic material calculated as carbon or (2) Contains not more than 45% ammonium nitrate and unrestricted combustible material.
- Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel, intermediate for blasting explosives, Division 5.1, UN3375.
- Ammonium nitrate-fuel oil mixture containing only prilled ammonium nitrate and fuel oil, Division 1.5D, NA0331.
- Ammonium nitrate, liquid (hot concentrated solution), Division 5.1, UN2426.
- Ammonium nitrate, with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance, Division 1.1D, UN0222.
- Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance, Division 5.1, UN1942.

Explanation of Hazard Class numbers:

- Division 1.1 - Explosives (with a mass explosion hazard) A mass explosion is one which affects almost the entire load instantaneously.
- Division 1.5 - Very insensitive explosives; blasting agents
- Division 5.1 - Oxidizer
- Class 9 - Miscellaneous Hazard Material

Refer to the DOT hazardous materials table at 49 CFR 172.101 for additional information.

DOT also requires safety and security plans for persons offering for transportation or transporting any quantity of a Division 1.1 material and placarded quantities of Division 1.5 material, or large bulk quantities (greater than 6,614 lbs. or 792 gals.) of ammonium nitrate, ammonium nitrate fertilizers, or ammonium nitrate emulsions, suspensions, or gels.

The safety and security plan must conform to requirements in 49 CFR 172 Subpart I. Department of Transportation Phone: (202) 366-5580 Public Information Website: http://www.dot.gov

Federal Explosives Regulations (ATF)

The Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) of the Department of the Justice regulates the importation, manufacture, distribution, and storage of explosive materials including blasting agents and other explosive materials containing AN. ATF's explosives regulations, 27 CFR Part 555, can be found at https://www.atf.gov/files/publications/download/p/atf-p-5400-7.pdf.

Bureau of Alcohol, Tobacco, Firearms, and Explosives Phone: (202) 648-7120 Website: http://www.atf.gov

INFORMATION RESOURCES

CODES AND STANDARDS

NFPA codes and standards are developed through a consensus standards development process approved by the American National Standards Institute.

This process brings together volunteers representing various viewpoints and interests to achieve consensus on safety issues.

These codes and standards are not binding but may be adopted by reference into laws or regulations.

Users of the codes and standards should consult applicable federal, state and local laws and regulations for conflicts or additional requirements.

NFPA 400 Code Chapter 11 addresses the storage, use, and handling of solid AN, including fertilizer grade, industrial grade and mixtures containing 60 percent or more AN by weight.

It also covers liquid AN solutions 70% or more AN by weight.

It does not cover AN or AN mixtures that are DOT Hazard Class 1 (explosives and blasting agents) which are covered in NFPA 495 and includes explosives and blasting agents containing AN.

NFPA 400 — Hazardous Materials Code, Chapter 11 - Ammonium Nitrate Solids and Liquids. (2016). The 2016 edition likely includes enhanced safety standards:

- Noncombustible construction for new storage buildings
- Fire detection and suppression system for existing buildings constructed of combustible materials and new storage buildings
- An emergency action plan should establish a safe evacuation distance based on approved analysis
- Emergency action plans for facilities storing AN must be prepared in accordance with accepted standards and approved by the Authority Having Jurisdiction
  NFPA 495 — Explosive Materials Code (2013). National Fire Protection Association 1 Batterymarch Park, PO Box 9101

Quincy, MA 02169-7471, Phone: 800-344-3555 (toll free) Website: http://www.nfpa.org/freeaccess

GENERAL REFERENCES

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2. Fertilizer Grade Ammonium Nitrate Safety and Security Guidelines for the Storage and Transportation of at Fertilizer Retail Facilities (February 2014). Agricultural Retailers Association and The Fertilizer Institute, Washington, DC, http://www.tfi.org/sites/default/files/images/an_guidance_handbook_-_mar_6_-_lk.pdf
3. ResponsibleAg, a joint venture of the Agricultural Retailers Association (ARA) and The Fertilizer Institute (TFI), is a Fertilizer Code of Practice management system that helps facilities establish basic Environmental, Health, Safety and Security (EHS&S) performance practices, https://www.responsibleag.org/. Other compliance tools available at Responsible Ag include:
   - Responsible Ag Compliance Assessment Tool (web based)
   - Responsible Ag Auditor Training Course
4. First Responder Guidance- Building Productive Relationships with First Responders. Agricultural Retailers Association, Washington, DC, www.aradc.org/firstresponderguide
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Health and Safety Executive (HSE), United Kingdom, http://www.hse.gov.uk/explosives/ammonium/

6. Safe Storage and Handling of Ammonium Nitrate (AN), Technical Note 60 (February 28, 2006), SafeWork, South Australia, http://www.safework.sa.gov.au/uploaded_files/SSAN_Storage.T60.pdf
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9. Guidance for the Safe Handling and use of Non-conforming Fertilizers and Related Materials (Producers) (2003). Fertilizers Europe, Brussels, Belgium, http://fertilizerseurope.com/index.php?id=6
10. Guidance for the Safe Handling and Use of Non-conforming Fertilizers and Related Materials for Fertilizer Importers, Distributors and Merchants (2004). Fertilizers Europe, Brussels, Belgium, http://fertilizerseurope.com/index.php?id=6
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12. Guidance for Compatibility of Fertilizer Blending Materials (2006). 2006 edition printed in 2014 by Fertilizers Europe Brussels, Belgium, http://fertilizerseurope.com/index.php?id=6
13. Ammonium Nitrate and Mixed Fertilizers Containing Ammonium Nitrate, FM Global Property Loss Prevention Data Sheet 7-89 (October 2013). FM Global, Johnston, RI, http://www.fmglobal.com/page.aspx?id=04010200 Free access with registration AN datasheet is under Individual Data Sheets-Hazards category
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23. Learning from Major Accidents- Toulouse Tragedy 2001 (2007). Environmental Risk Reporting and Information System, Indian Chamber of Commerce, Calcutta, India, http://www.erris.org/accidents/majaccidents/toulouse.html
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25. The National Safety Council data sheet Ammonium Nitrate Fertilizer, Data Sheet I-699 (1991) discusses the health hazards, properties, and precautions for safe storage and handling of AN fertilizer. National Safety Council 1121 Spring Lake Drive Itasca, IL 60143-3201, Phone: (800) 621-7269 (toll free) or (630)-775-2199 (Library) Website: http://www.nsc.org
26. The Fertilizer Institute (TFI) produces information on various fertilizer products, including AN, and their uses. The Fertilizer Institute, 425 Third Street SW, Suite 950,

Washington, DC 20024, Phone: (202) 962-0490, Website: www.tfi.org

27. For more detailed information on the safe handling practices for storage of explosive materials which may contain AN, please consult the following Safety Library Publications (SLPs) developed by the Institute of Makers of Explosives (IME).
    - Construction Guide for Storage Magazines, IME SLP No. 1 (September 2006).
    - The American Table of Distances, IME SLP No. 2 (October 2011).
    - Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession, and Use of Explosive Materials, IME SLP No. 3 (October 2009).
    - Handbook for the Transportation and Distribution of Explosive Material, IME SLP No. 14 (May 2013).
    - Safety in the Transportation, Storage and Use of Explosive Materials, IME SLP No. 17 (October 2011).
    - Recommendations for the Transportation of Explosives, Division 1.5, Ammonium Nitrate Emulsions, Division 5.1, Combustible Liquids, Class 3, and Corrosives, and Liquids, Class 8 in Bulk Packaging, IME SLP No. 23 (October 2011).
    - Explosives Manufacturing and Processing Guide to Safety Training, IME SLP No. 25 (May 2011). SLPs are available at https://www.ime.org/products/category/safety_library_publications_slps

    Institute of Makers of Explosives, 1120 Nineteenth Street NW, Suite 310, Washington, DC 20036-3605, Phone: (202) 429-9280, Website: www.ime.org
28. SAFEX International is voluntary association of explosives and TGAN manufacturers from all over the world. SAFEX has published a guide for safe storage of TGAN listed below that is available to its members. https://www.safex-international.org/_index.php.

    Good Practice Guide: Storage of Solid Technical Grade Ammonium Nitrate (March 2011). SAFEX International. SAFEX Good Explosive Practice Series, GPG 02 rev. 1

CHEMICAL EMERGENCY PREPAREDNESS AND PREVENTION ADVISORY: Ammonia

HOME

This advisory recommends ways Local Emergency Planning Committees (LEPCs) and chemical facilities can minimize risks posed by the presence of ammonia in their communities.

Ammonia is toxic if swallowed or inhaled and can irritate or burn the skin, eyes, nose or throat through inhalation or direct contact.

Careless storage or mixing of ammonia with other chemicals can cause the release of toxic ammonia vapors, as well as fires and high-pressure releases, and result in injuries or death to unprotected community members.

Its toxicity and high production volume prompted EPA to list ammonia as an extremely hazardous substance (EHS) under Section 302 of the Emergency Planning and Community-Right-to-Know Act (commonly known as SARA Title III).

In addition, OSHA regulations require that facility employees who could potentially be exposed to ammonia in any form be trained in the safe use and potential hazards posed by this chemical.

EPA stresses that although mishandling of ammonia can cause harm, there is no cause for undue alarm about its presence in the community.

Ammonia is typically handled safely and without incident. More than 70% of all ammonia produced today in the U.S. is used either in direct application as a fertilizer or to manufacture other fertilizers.

Anhydrous ammonia is commonly applied directly to soils to bolster the strength of plant roots, improve nutrient uptake, and stimulate growth.

Ammonia is also used to purify municipal and industrial water supplies, as an oxygen scavenger in treating boiler feed water, and as a refrigerant gas in commercial installations.

Reducing the use of chlorofluorocarbons as refrigerants, in efforts to protect the ozone layer, will likely increase reliance on ammonia for refrigeration which may result in even greater production and storage volumes of ammonia at a greater number of facilities.

RECOMMENDED STEPS FOR LEPCS

Section 302 of SARA Title III requires LEPCs to develop comprehensive emergency plans to address facilities where ammonia as well as other EHSs and hazardous materials are present in excess of their threshold planning quantities (500 pounds for ammonia).

Because ammonia is widely used in large quantities and poses a significant health and safety hazard, EPA suggests that LEPCs take the following steps:

Hazards Identification:

- Know where ammonia could be found. Facilities that routinely use ammonia include:
  - Cold storage facilities;
  - Fertilizer manufacturers and farms;
  - Synthetic fibers and plastics plants;
  - Rubber manufacturers;
  - Pharmaceutical companies;
  - Alkali plants;
  - Chemical manufacturers (e.g., nitric acid explosives);
  - Metal processing plants;
  - Manufacturers of cleaning products;
  - Skating rinks;
  - Tanneries;
  - Pulp and paper processors; and
  - Petroleum refineries and natural gas plants.
- Send a copy of this advisory to all such facilities in your LEPC jurisdiction, calling their attention to the recommended steps for facilities in the section below.
- Be familiar with other names for “ammonia.” Trade names for ammonia include AM-FOL. ammonia gas, anhydrous ammonia, Nitro-Sil, R 717, Spirit of Hartshom, and liquid ammonia.
- Be aware that products similar to ammonia (e.g.,ammonium hydroxide), while not on the list of EHSs, may still give off ammonia vapors upon release.
- Ensure that the facilities covered by Sections 302, 311, and 312 of SARA Title III have provided to the LEPC and local fire departments adequate information about ammonia stored at their location.

  Gather information about smaller quantities of ammonia as well. (Not all facilities using or storing ammonia will met the reporting thresholds.)

  The LEFC can request material safety data sheets (MSDSs) for hazardous chemicals present at a facility in amounts below the threshold.

Emergency Planning:

- Engage in a dialogue with facilities about possibilities for reducing ammonia inventories or providing special protection to containment vessels. Be aware that reducing inventories could lead to an increase in transportation-related releases.
- Regularly exercise and review Title III plans to ensure that facilities handling large quantities of ammonia are

covered, and that emergency response issues concerning possible releases of ammonia have been addressed.
- Ensure that local hospitals and physicians are properly trained and prepared to treat victims of ammonia exposure.
- Ask facility officials for copies of their emergency response plans so the LEPC and fire departments can use them to prepare pre-incident plans and also ensure that facility and community plans are coordinated.

Risk Communication:

- Inform the community of the potential hazard, as well as methods for treating victims of ammonia exposure.
- Inform farmers or other handlers of ammonia of the hazards related to ammonia and the need for safe handling and storage. For example, large quantities of fertilizer should not be stored near explosive or flammable materials.

RECOMMENDED STEPS FOR FACILITIES

In cooperation with LEPCs and local response officials, facilities should take the following steps:

Handling and Storage:

- Ensure that all containers, piping, valves, and fittings contacting ammonia are constructed of iron, steel or other ammonia-compatible materials, as ammonia is corrosive to even trace amounts of copper, zinc, silver, and many of their alloys.
  Check that the ammonia contains at least 0.2% water to prevent stress corrosion of the recommended compatible materials.
- Install tank pressure gauges and safety valves on ammonia gas storage tanks for pressure relief.
- Install leak detectors if facilities are unstaffed for periods of time.
- Refer to Department of Transportation (DOT) regulations for shipping, packaging, marking, and labeling requirements.
  Also refer to the Compressed Gas Association publications G-2.l/ANSI K61.1- 1989 and ANSI/ASHRAE 15 for guidelines on safe handling and storage of anhydrous ammonia.

Employee Safety:

- Ensure that adequate training is provided to all facility employees concerning the safe handling, storage, and use of ammonia.
- Ensure that the proper protective equipment is easily accessible in case ammonia is released. Train employees in the proper use of the equipment.

Hazard Awareness:

- Do not mix ammonia (or products similar to ammonia) with chlorine compounds. While each can be a good cleaning agent alone, a mixture of the two can be dangerous.
- Keep ammonia away from other chemicals. Ammonia may react with other substances (e.g.. strong oxidizers, calcium, bleaches, halogens, gold, mercury, and silver) causing fires, explosions, and releases of highly toxic gases.
- Be aware of other hazards associated with ammonia. For example, heat from a may cause compressed ammonia gas to expand rapidly.
  Properly sized pressure relief valves are used to protect storage tanks and prevent rupturing during a fire.
  Water can be used to control the temperature of the tank and prevent softening of the containment material, thereby minimizing any rupture.
- Further information about hazards posed by ammonia may be obtained from the following organizations: The Fertilizer Institute, 501 Second Street, N.E.. Washington, DC 20002, (202) 6758250; and the International Institute of Ammonia Refrigeration, 1101 Connecticut Avenue, N.W., Washington, DC 20036, (202) 857- 1100.

Risk Minimization:

- Place tanks containing ammonia outdoors or in well-ventilated, detached, or segregated areas to minimize damage from possible tank ruptures, explosions, or fires.
- Ensure that no containers are leaking or broken, and conduct regular maintenance checks of all equipment and containers coming in contact with ammonia.

Emergency Notification:

- In the event of a release, contact the National Response Center [(800) 424-8802], your SERC and LEPC, and the local fire department.
- When contacting these organizations, provide the following information: chemical name, estimate of quantity released, time and duration of the release, affected media, a list of potential health risks, and the name and telephone number of a contact person at the facility.

A NEW FEDERAL LAW

Ammonia is specifically mentioned in the accidental release provisions of the Clean Air Act Amendments of 1990. This law requires EPA to promulgate an initial list of at least 100 substances that cause death, injury, or serious adverse health effects to human health or the environment, and determine a threshold quantity for each. Congress has identified the first 15 substances to be included on this list; ammonia is among them. Where regulated substances above the threshold quantity are present at a facility, the owner/operator will be required to prepare a risk management plan that includes a hazard assessment, an accidental release prevention program, and a response program.

The law requires that EPA publish regulations under the amended Clean Air Act within three years, and allows facilities an additional three years to comply. Facilities will be required to provide copies of the risk management plan to the LEPC as well as to the state. In addition, OSHA will promulgate, no later than November 15, 1991, a final rule that will require facilities with certain highly hazardous chemicals present in excess of OSHA thresholds to implement chemical process safety management, an integrated approach to identifying the hazards and managing the risks posed by on-site chemicals. Ammonia is included on the OSHA list as well.

OTHER INFORMATION

The following is a listing of some sources of information about ammonia and the Emergency Planning and Community Right-to-Know Act.

- Handwork of Compressed Gases and Anhydrous Ammonia (CGA G-2). Copies of both documents are available from: Compressed Gas Association
- DOT's 1990 Emergency Response Guidebook Copies are available from: American Trucking Associations
- CHEMTREC, a 24-hour emergency hotline that provides information and assistance to responders during an emergency. Contact (800) 424-9300. (Note: CHEMTREC is for emergency use only.)
- Response Information Data Sheets (RIDS) found in CAMEO II, a computer-based planning and response management program that is available from: The National Safety Council
- Your County or State Health Agency
- Your State Emergency Response Commission
- Your EPA Regional CEPP Coordinator. EPA Regional offices are located in Boston, New York, Philadelphia, Atlanta, Chicago, Dallas, Kansas City, Denver, San Francisco, and Seattle.
- EPA's Emergency Planning and Community Right-to-Know Information Hotline at (800) 535-0202

CHEMICAL SAFETY ALERT: Emergency Isolation for Hazardous Material Fluid Transfer Systems – Applications and Limitations of Excess Flow Valves

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. We are striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and consider whether additional action is needed to address the hazards.

Problem

While excess flow valves (EFV) are in extensive service and have prevented numerous pipe or hose breaks from becoming much more serious incidents, experience has shown that in some cases the EFV did not perform as intended, usually because of misapplication. Also, undue reliance must not be placed on EFVs as the sole or primary protection to control accidental chemical releases from tanks or piping.

Excess flow valves are protective devices intended to prevent the uncontrolled release of hazardous materials from road, rail and marine transport vessels, stationary storage vessels and distribution networks. EFVs are designed to close when the flow rate through them exceeds the expected range of normal operation, for example due to a downstream leak or valving error that provides an unintended release path to the atmosphere. EFVs are intended to bring the release under control until the leaking element (e.g. hose or pipe) can be blocked in and positively isolated for corrective action.

Industry incident experience, however, has shown that under certain circumstances, EFVs can fail to provide the protection anticipated of them. In fact, a number of significant releases of hazardous materials have occurred from systems 'protected' by EFVs. One event investigated by the National Transportation Safety Board (NTSB) resulted in the deaths of three plant employees and the evacuation of 2,000 nearby residents. Concerned that undue reliance might be placed upon EFVs, the NTSB recommended in its investigation report that EPA:

> "Notify all facilities that are required to submit risk management plans to the Environmental Protection Agency that tank car excess flow valves cannot be relied upon to stop leaks that occur during tank car loading and unloading operations and that those companies that have included reliance on such valves in their risk management plans should instead identify and implement other measures that will stop the uncontrolled release of product in the event of a transfer line failure during tank car loading or unloading."

EPA shares the NTSB's concerns and additionally recognizes that the use of EFVs extends beyond tank cars and includes loading and unloading operations associated with tank trucks, marine barges, stationary tankage and piping distribution networks. This Hazard Alert is intended to provide an understanding of (1) how EFVs function, (2) circumstances that can lead to their failure to function as intended, (3) important design and operational factors for enhancing the reliability of EFVs, and (4) alternate means available for stopping uncontrolled releases.

Facilities should be aware of, and give proper regard to, industry best practice guidance and regulatory requirements for the use of EFVs.

When they are properly designed, installed, and maintained, EFVs play an important role in comprehensive accidental release prevention systems. It is not EPA's intent to dissuade the regulated community from the use of EFVs but, rather, to provide precautionary guidance regarding their use as a sole means of protection.

Accidents

Provision should be included for blocking in (isolating) hazardous material transfer lines in addition to the protection provided by EFVs. As in the following incidents, failure to understand the limitations of EFVs has been a contributing factor in a number of significant incidents where flow restriction prevented EFV closure.

8/2002 in Missouri – A chlorine railcar transfer hose ruptured, releasing 48,000 pounds of chlorine. Hundreds of residents were evacuated or sheltered-in-place, and sixty-three local residents sought medical evaluation; three were admitted to the hospital. The chlorine also damaged tree leaves and vegetation around the facility. The CSB determined that an excess flow valve internal to the chlorine railcar did not close, contributing to the severity of the event. As a result of such chlorine releases, the CSB has issued a recommendation to the Department of Transportation (DOT) to expand the scope of DOT regulatory coverage to include chlorine railcar unloading operations and ensure the regulations specifically require remotely operated emergency isolation devices that will quickly isolate a leak in any of the flexible hoses (or piping components) used to unload a chlorine railcar.

7/2001 in Michigan – A methyl mercaptan release occurred when a pipe attached to a fitting on the unloading line of a railroad tank car fractured and separated. Fire damage to cargo transfer hoses on an adjacent tank car also resulted in the release of chlorine gas. Neither of the two EFVs closed to control the release. Three plant employees were killed in the resulting explosion and several employees were injured. Approximately 2,000 local residents were evacuated from their homes for 10 hours. Failure of the EFVs to close contributed to the severity of the incident. The NTSB determined that the facility placed undue reliance on the tank car EFV to close in the event of a leak from the transfer line.

4/1998 in Iowa – A propane release occurred when a vehicle struck and severed unprotected, aboveground liquid and vapor lines serving an 18,000-gallon propane storage tank. The lines fed vaporizers, which fueled heaters located in barns and other farm structures. The liquid line, which was sharply reduced in pipe diameter, was completely severed where it connected to a manual shut-off valve directly beneath the tank. The release ignited and the tank subsequently exploded, killing two fire fighters and injuring seven other emergency personnel. A subsequent CSB investigation determined that the flow capacity of the liquid outlet piping system downstream of the EFV was insufficient to allow the EFV to close.

9/1999 in North Carolina – More than 35,000 gallons of propane were released when the discharge hose on an LPG transport truck separated from its hose coupling at the delivery end of the hose, and none of the safety systems on either the truck or the receipt tank worked as intended to stop the release. The DOT determined that emergency systems such as EFVs do not always function properly when a pump is used to unload the protected vessel. If a release occurs downstream of the pump and the EFV activation point is greater than the pump capacity, the pump will function as a regulator limiting the flow to below that required to close the EFV.

Two common themes in these accidents are that flow restrictions prevented the flow through an EFV from exceeding the shut-off flow rate, and emergency isolation block valves were not activated. A literature review revealed a number of additional incidents where the rates of discharge from releases were insufficient to close the EFVs.

The literature also shows, cases such as the one below, where an EFV was not installed but would have been beneficial:

7/1998 in Virginia – A natural gas release occurred in the underground feed line serving a newly constructed residence in which the occupants had moved-in just hours before. The leaking gas entered the basement where it found an ignition source and exploded killing one of the new owners and injuring the other parent and their two children. The investigation report concluded that the release was attributed to the plastic feed line being damaged by heat from a faulty splicing in a buried electrical service cable located close to the natural gas line. The natural gas feeder line was not equipped with an excess flow valve. Among the findings it was concluded that "Had an excess flow valve been installed in the gas line to the residence, the valve would have closed after the hole in the pipeline developed, and the explosion likely would not have occurred."

Understanding the Hazard

Proper use of EFVs requires an understanding of their capabilities and their limitations.

The National Fire Protection Association (NFPA) defines an EFV as a "valve designed to close when the liquid or vapor passing through it exceeds a prescribed flow rate" (NFPA 58). EFVs are most commonly used on the liquid and vapor connections of transport containers (e.g., rail cars and tank trucks) and on some stationary tankage. EFVs are often installed inside of the vessel so that protection is provided even if the piping external to the vessel is damaged. EFVs are also very commonly used in natural gas distribution lines serving end-users such as residential and commercial consumers. Figure 1 shows an EFV installed in the liquid unloading line on a chlorine railcar. In-line EFVs can also be installed in external piping systems (e.g., to protect individual distribution lines).

EFVs are used with a variety of hazardous chemicals, of which chlorine, liquefied petroleum gases (LPG), natural gas and anhydrous ammonia are among the most common. Consequently, these four chemicals are used as examples in this Hazard Alert. Guidance for the application of EFVs with regard to these four chemicals is issued, respectively, by the Chlorine Institute (CI), NFPA, and the Compressed Gas Association (CGA). Regulatory requirements for the usage of EFVs are imposed by various state and federal agencies, including the Occupational Safety and Health Administration (OSHA) and the DOT.

Figures 2 and 3 illustrate two common designs for EFVs. The valve in Figure 2, designed for use on a chlorine rail car or tank truck, contains a ball that is driven upwards against a seat to stop the flow when it exceeds the shut-off rate. The design of this type of EFV requires that it be mounted in the vertical orientation shown in the figure. The valve shown in Figure 3 is used in LPG and anhydrous ammonia service. A spring normally holds the plug in the open position shown. When the flow through the valve is high enough, the plug is forced against the seat, stopping the flow. This design permits the valve to be installed in any orientation. It should be noted that EFVs permit flow in both directions, but only stop flow in one direction. Consequently, flow direction must be correctly considered in the installation of the EFV. In both figures, the protected flow direction would be upwards through the valves.

The potential for flow restrictions preventing the closure of the EFV is well recognized by organizations issuing good practice guidance for the use of EFVs. For example, the CI cautions that the EFV is principally a protection against an event that damages the manual valve on the transport container during transit and not a protection against damage to connected loading or unloading system piping. The CI notes that the EFV "may close if a catastrophic leak involving a broken connection occurs but it is not designed to act as an emergency shut-off device during transfer." CI guidance does not specify the use of EFVs on stationary tankage, but recognizes that some users choose to use EFVs in such a manner. CI pamphlets addressing EFVs are identified in the Information Resources section, below.

The installation of EFVs in stationary tankage is commonly used with LPG and anhydrous ammonia. NFPA, in its Liquefied Petroleum Gas Code, specifies that, where EFVs are required, the "connections, or line, leading to or from any individual opening shall have greater flow capacity than the rated flow of the excess-flow valve protecting the opening." CGA, in its Safety Requirements for the Storage and Handling of Anhydrous Ammonia, specifies that "piping, including valves and fittings in the same flow path as the excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve."

The National Propane Gas Association (NPGA) notes a number of conditions which could result in the failure of an EFV to close:

- Piping system restrictions such as pipe length, branches, reduction in pipe size, and partially closed shut-off valve, could limit the flow rate through the EFV.
- The size of break or damage downstream of the EFV is not large enough to allow a flow sufficient to close the valve.
- The system pressure upstream of the EFV is not high enough to produce a closing flow rate.
- Foreign matter such as welding slag or a build up of process contaminants lodged in the EFV can prevent its closing.
- The piping break or damage occurs upstream of an in-line EFV.
- The flow through the EFV is in the wrong direction.
- The EFV has been damaged, or is otherwise not operable.

Recognizing the limitations inherent in the design and application of EFVs, NPGA, CI, NFPA, and CGA all recommend or require the use of some secondary means of preventing uncontrolled releases in certain high risk situations.

Controlling the Hazard

Careful analysis is required in order to determine how much reliance can be placed upon EFV's ability to bring the rate of release under control, and to identify any necessary and appropriate supplemental controls for accidental releases.

System Design and Installation

System design and installation issues must be considered in evaluating the degree of reliance to be placed on an EFV. Considerations should include:

- For the EFV to close, the failure in the downstream piping must result in enough flow to exceed the EFV activation point. Analyze credible, catastrophic failures at likely release points, such as flexible hoses in unloading systems, to determine if the flow resistance in the piping both upstream and downstream of the EFV might prevent the EFV from closing.
- The characteristics of the hazardous material have to be considered. Release rate calculations must address the effect on flow rate of two-phase flow that will result upstream of the release point when liquefied compressed gases flash to vapor as system pressure is released.
- The pressure in the vessel must be adequate to produce the flow necessary to seat the EFV. Consider the effects of low vapor pressure liquids and minimum credible winter temperatures.
- The type of EFV specified must be appropriate to the intended service, and any necessary constraints on the physical orientation of the valve must be identified.
- The system must be installed in strict accordance to design specifications.
- The flow capacity of the EFV must be great enough to avoid nuisance flow stoppages caused by normal variations in process flow rates, but not so high as to negate its protective function.
- A piping system network with smaller branch lines coming off the main line will need separate EFVs to control releases in these branch lines.
- A release that is not large enough to activate the EFV can still be large enough to lead to serious consequences and thus require alternative control capability.

Operation and Maintenance Practices

Like any safety device, an EFV must be properly maintained and operated in order for it to provide its intended protective function. There should be:

- An appropriate inspection, testing (including verification of flow rate necessary to activate the EFV), and preventive maintenance program for the EFV based upon past experience, the characteristics of the process stream, and standard EFV maintenance guidelines (e.g., CI Pamphlet 042, which may provide guidance to facilities handling other chemicals).
- Operating procedures and training to address the operation of the EFV and all supplemental controls.
- Controls to manage system changes that might otherwise compromise the function of the EFV. (Management of Change)

Determining the Need for Additional Protection

Facilities, absent any applicable industry guidance or regulatory requirements, should take a risk-based approach in evaluating the need to supplement EFVs in controlling accidental releases. Considerations, addressing both the consequences and the likelihood of a catastrophic release, would include:

- The hazardous nature of the chemical involved, such as toxicity, flammability, and hazard to the environment.
- The size of potential releases, depending on the potential for significant back-flow to the point of release, size of inventory, and flow rates involved.
- The likelihood of a release, depending on frequency of loading and unloading operations and type of equipment used. A system containing flexible hoses or articulated (swivel-joint) piping may be more prone to a release than a system containing more robust rigid piping.
- Local conditions such as the possibility of flooding, mud or rock slides, wash-outs, sink holes and subsidence or other earth movement situations warrant particular attention for stationary systems.
- The severity of a credible release on surrounding populations, workers, facilities, and the environment.

Alternative/Additional Means for Controlling Releases

Industry guidance and regulatory requirements increasingly recognize the prudence of providing alternative means of stopping accidental releases in certain situations, either in place of or in addition to EFVs. Examples of approaches used in industry include:

- Remotely isolating leaking transfer systems, with particular emphasis on flexible hoses, by bolting fail-safe (air-to-open) actuated valves on the discharge side of railcar manual valves.
- Shut-off protection by quick closing valves that can be controlled from locations that would be accessible even in the event of a release.
- Emergency shutoff valves equipped for remote manual closure and automatic shutoff using thermal (fire) actuation or chemical detection. The valve may be internal to the tank, in lieu of an EFV, or it may be installed external to the tank as close as practical to the tank outlet, provided there is an internal EFV. Emergency shut-off systems should be thoroughly tested on a regular schedule to ensure that they will operate as intended when needed.
- Commercially available hoses with a self closing device at each end that will shut off flow entering the hose from either direction if the hose is pulled apart or sheared may be considered as an additional measure of protection. Such devices will protect against hose failure, but not against leaks that occur upstream or down-stream of the hose.

The technologies, systems, and practices cited above are meant only to be illustrative; they do not constitute a definitive list of options, and are not meant to establish ‘requirements’ for any particular application. Additional details are provided in the references at the end of this Alert. References to regulatory requirements and industry best practices are not intended as interpretations and users should consult the referenced documents to determine applicability to their own particular circumstances.

If it is determined that manual (“hand-on”) intervention is the most appropriate approach to responding to releases, a critical analysis should be made of issues such as: the number and location of isolation valves relative to likely points of release; the properties of the released chemical and the correspondingly required personal protective equipment (PPE); personnel staffing, location and response times; and the adequacy of training provided to personnel responding to a release.

What Needs To Be Done

EPA urges users of EFVs to evaluate their applications to verify the operability of in-place controls and to determine whether additional controls are warranted to minimize the risk of release of hazardous materials.

Industry experience indicates that sole reliance on EFVs to control accidental releases may not always be sufficient and needs to be substantiated by a thorough engineering and risk evaluation. In most cases where supplemental controls were available and clearly identified, they were successfully applied.

Where this has not been the case, appropriate revisions should be made to Risk Management Program elements such as operating procedures, training, and emergency response plans.

Conclusion

Millions of EFVs are in service and each year many properly-sized and correctly installed EFVs operate as intended to greatly mitigate the consequences of hazardous material releases.

Incident investigations show that when the EFV was in place but did not function as intended, it was usually because either the valve was not correctly sized and flow-rated or line restrictions or low inlet pressure prevented sufficient flow needed for valve closure.

Mechanical malfunction of the EFV is very rarely shown to be a contributing factor. Release rates that are less than the EFV activation rate represent a very serious situation.

Natural gas or city gas leaks downstream of the regulator or meter fall into this category. Alternate or additional means of release prevention/mitigation should be installed for high-risk situations and situations where EFV’s may not be effective.

Information Resources

References with information about the use of EFVs and other methods for controlling hazardous releases are listed below. Regulations potentially applicable to EFVs and codes and standards that may be relevant are also included.

Statutes and Regulations

- Clean Air Act Section 112(r)(1) – General Duty
- EPA's Risk Management Program Rule [40 CFR 68]
- OSHA Process Safety Management Standard [29 CFR 1910.119]
- OSHA Standards: 29 CFR 1910.110, Storage And Handling Of Liquefied Petroleum Gases; 29 CFR 1910.111, Storage and Handling of Anhydrous Ammonia; and 29 CFR 1926.153, Liquefied Petroleum Gas (LP-Gas)
- DOT regulations [49 CFR 171-180]

Codes and Standards

- The Chlorine Institute, Inc.: Pamphlet 001, Chlorine Manual; Pamphlet 042, Maintenance Instructions for Chlorine Institute Standard Excess Flow Valves; Pamphlet 049, Recommended Practice for Handling Bulk Highway Transports; Pamphlet 057, Emergency Shut-Off Systems for Bulk Transfer of Chlorine; Pamphlet 066, Recommended Practice for Handling Chlorine Tank Cars
- The Compressed Gas Association, Inc.: ANSI K61.1 (CGA G-2.1), American National Standard Safety Requirements for the Storage and Handling of Anhydrous Ammonia
- The National Fire Protection Association, Inc.: NFPA 58, Liquefied Petroleum Gas Code
- Freeman, R. A., and D.A. Shaw, "Sizing Excess Flow Valves," Plant/Operations Progress, Vol. 7, No. 3, July 1988
- UK Health and Safety Executive: "Emergency Isolation," http://www.hse.gov.uk/hid/land/comah/level3/5c7177c.htm

Accident Histories

- National Transportation Safety Board, Hazardous Materials Accident Report NTSB/HZM-02/01, "Hazardous Materials Release From Railroad Tank Car With Subsequent Fire at Riverview, Michigan, July 14, 2001"
- National Transportation Safety Board, Pipeline Accident Report, NTSB/PAR-01/01, "Natural Gas Explosion and Fire in South Riding, Virginia July 7, 1998"
- U.S. Chemical Safety and Hazard Investigation Board, Investigation Report No. 98-0071-1-1A, "Propane Tank Explosion (2 Deaths, 7 Injuries), Herrig Brothers Feather Creek Farm, Albert City, Iowa, April 9, 1998."
- U.S. Chemical Safety and Hazard Investigation Board: Investigation Report No. 2002-04-I-MO, "Chlorine Release (66 Sought Medical Evaluation), DPC Enterprises, L.P., Festus, Missouri, August 14, 2002."
- U.S. Chemical Safety and Hazard Investigation Board: Safety Advisory No. 2002-01-SA, "Chlorine Transfer Hose Failure"
- U.S. Chemical Safety and Hazard Investigation Board: Safety Bulletin No. 2005-06-I-LA, "Emergency Shutdown Systems for Chlorine Transfer"
- For More Information: Call the Superfund, TRI, EPCRA, Risk Management Program, and Oil Information Center, (800) 424-9346

ALERT: EXPLOSION HAZARD FROM ETHYL ETHER IN DISASTER HOSPITAL KITS

HOME

(Ethyl Ether synonyms: diethyl ether, ether, ethyl oxide) (CAS # 60-29-7)

PROBLEM

Ethyl ether was distributed to states in the 1960s and 1970s as part of civil defense hospital, kits. It was originally intended for use as an anesthetic.

The ethyl ether remaining in the hospital kits should later have been disposed. Much of it wasn't. The ethyl ether now presents an explosive and toxic hazard.

Ethyl ether auto-oxidizes to form explosive polymeric peroxides.

It also tends to absorb and react with oxygen from the air to form unstable peroxides that may detonate with extreme violence when disturbed by heat, shock, or friction. An 8-ounce can or vial of ethyl ether in which peroxides have formed has the potential explosive force of one stick of dynamite.

In the 1980s, the federal government issued orders to dispose of the hospital disaster kits.

However, in some cases, local authorities did not dispose of the kits, but had the kits stored in various locations, including public buildings.

EPA Region 1 recently discovered that of eight hospital kits recorded as having been disposed, six kits were still in storage.

Authorities have speculated that ethyl ether from the hospital kits may have caused several fires of unknown origin in municipal buildings across the country.

Although no explosions associated with ethyl ether have been reported, be on the lookout for old hospital disaster kits containing ethyl ether in your area.

HAZARD AWARENESS

Pure Ethyl Ether

In addition to being extremely flammable and potentially explosive; ethyl ether is also toxic.

Ethyl ether's boiling point, 94.3° F, is an indication of its volatility. Its low flash point, -42° F, signals that it can be ignited easily when mixed with air. Indeed, such mixtures can explode when ignited if the concentration by volume of ethyl ether in air is between 1.9 percent and 36.5 percent.

Hence, sources of ignition like heat flames, and sparks must be eliminated where ethyl ether is stored.

Ethyl ether can affect the body if it is inhaled, swallowed, or comes in contact with the eyes or skin.

Ethyl ether is listed by the Occupational Safety and Health Administration (29 CPR l910.1000) as having a permissible exposure level for a 40-hour work week of 400 parts per million in air.

Short term overexposure to ethyl ether may cause irritation of the eyes, nose, and throat.

It is also a depressant of the central nervous system and may cause dizziness, stupor, nausea, drowsiness, unconsciousness, or even death.

Old Ethyl Ether

The greatest danger from the caches of ethyl ether recently rediscovered is that of explosion when attempts are made to move them.

The longer the ethyl ether has been stored, the greater the explosion hazard as peroxides build up.

Peroxides that are formed in the ethyl ether may detonate if they are jarred or stressed, for example when opening the container lid.

Since peroxides form in ethyl ether exposed to air, a partly filled container or one that has been opened is more dangerous than a filled, unopened one.

Hence, prompt removal and destruction of aged ethyl ether by trained personnel is essential.

IDENTIFYING ETHYL ETHER

The old ethyl ether uncovered recently is typically contained in 8-ounce screw top cans that also have a removable red elastomeric stopper in a spout. Both the cans and cases are typically labeled.

SEARCHING FOR ETHYL ETHER

When the presence of ethyl ether is suspected, a qualified team should conduct the search: fire fighters, police, bomb squad, and emergency medical services, as well as local and state emergency management personnel.

In the interim between discovery and removal, access to the ethyl ether should be restricted, so that unauthorized personnel, including untrained workers, children, pets, and curious visitors do not inadvertently cause the ethyl ether to explode or expose themselves to the fumes.

Since ethyl ether stored a long time may be shock sensitive, the team must take extensive precautions to prevent harm to people when removing and disposing of the ethyl ether.

DISPOSAL OF ETHYL ETHER

You should treat old ethyl ether as an explosive, even if you do not believe it was exposed to air. Only personnel specifically trained for the job should dispose of old ethyl ether.

Possible methods of disposal include detonation from a distance, controlled incineration, or dilution with certain solvents.

Such treatment of ethyl ether must be in compliance with the Resource Conservation and Recovery Act. Ethyl ether may not be put into either a household waste landfill or a hazardous waste landfill.

For information on how to dispose of ethyl ether safely, you should contact your state pollution control or environmental management agency.

The state agency will be able to give you advice on what methods of disposal are allowed under state law and what permits are necessary to dispose of ethyl ether.

The state agency may also be able to direct you to companies qualified to handle this type of job.

INFORMATION RESOURCES

The ethyl ether distributed decades ago as components of disaster hospital kits and still being stored is the responsibility of the local and state governments that accepted it.

EPA can assist those responsible for disposing of it with advice, and information.

Also, State Emergency Response Commissions and Local Emergency Planning Committees may be helpful in dealing with old ethyl ether.

To learn more about the hazards of ethyl ether and correct methods of handling and disposing of it, contact the hotline listed below.

Emergency Planning and Community Right-to-Know Information Hotline: (800) 535-0202

CHEMICAL SAFETY ALERT: Rupture Hazard from Liquid Storage Tanks

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. We are striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence.

Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and consider whether additional action is needed to address the hazards.

Problem

Over the past few years, there have been several catastrophic failures of liquid several catastrophic failures of liquid fertilizer storage tanks resulting in property damage and environmental contamination. These ruptures have involved site-erected storage tanks with capacities ranging from 500,000 to 2 million-gallons.

In several of the tank failures cited in this alert, the tanks were built by either Carolyn Equipment Company of Fairfield, Ohio, or Nationwide Tanks, Inc. of Hamilton, Ohio. Both of these companies have since gone out business (Carolyn Equipment in 1990 and Nationwide Tanks in 1995.)

This alert describes some of the tank failures and identifies standards and precautions that apply to aboveground liquid storage tanks. While all users of aboveground liquid storage tanks should take appropriate steps to maintain tank integrity, owners of tanks produced by these two manufacturers are advised to take extra precautions to guard against tank failure.

Accidents

3/1997 in Iowa: A 1-million gallon tank containing ammonium phosphate ruptured and released its contents. The walls of the ruptured tank fell onto two other tanks and broke their valves. One tank contained 1-million gallons of a nitrogen liquid fertilizer and the other tank held ammonium thiosulfate. Much of the release was contained by an earthen dike, but immediate construction of a secondary, temporary dike was necessary to keep the release from flowing into the nearby Missouri River. Cleanup involved pumping the liquid out of the dikes and removing all contaminated soil.

7/1999 in Michigan: A 1-million gallon tank full of ammonium polyphosphate ruptured and damaged three other tanks. Fortunately, the tanks were surrounded by earthen dikes lined with polyethylene. This minimized the environmental damage.

1/8/2000 in Ohio: A 1-million gallon tank of liquid fertilizer ruptured and damaged four adjacent tanks. The wave of liquid broke a concrete dike wall and hit five tractor-trailer rigs, pushing two of the rigs into the river. A total of 990,000 gallons of material were released. More than 800,000 gallons of the liquid spilled into the Ohio River. Sampling detected amounts of the fertilizer mixture 100 miles downstream, which is expected to increase algae growth in the river. The company has discontinued use of seven other tanks purchased from the same manufacturer.

3/8/2000 in Ohio: At the same facility, a 1.5 million gallon tank of ammonium phosphate ruptured and damaged three nearby tanks causing them to leak. Two of the damaged tanks held phosphoric acid and the third one held 'Ice-Melt', a magnesium chloride mixture. The released liquid overflowed the dike walls into nearby creeks. The four tanks were dismantled after the incident. Over 1.8 million gallons of contaminant were recovered, with an additional 450,000 gallons of contaminated water recovered from the sewer system. The release caused evacuation of a nearby school, and the public was forced to use bottled water because of concern that the drinking water supply may be contaminated by the spilled chemicals.

11/12/2008 in Virginia: A 2-million gallon tank of urea ammonium nitrate fertilizer ruptured, seriously injuring two workers. The released liquid fertilizer overtopped the secondary containment berm surrounding the tank, partially flooded an adjacent residential neighborhood, and contaminated the southern branch of the Elizabeth River. Nearby residents were ordered to evacuate for several days.

Hazard Awareness

Defective Welds

In the incidents cited, all of the above-ground liquid storage tanks that failed appeared to have had defective welds. Several of the tanks were produced by either Carolyn Equipment Company or Nationwide Tanks Incorporated. Both companies have since gone out of business.

These tanks were under warranty for only one year, and the welding of the tanks was done by subcontractors hired by the two companies. The companies built tanks in Michigan, Ohio, Indiana, Illinois, Missouri, and Iowa between 1980 and 1995.

Because of increased frequency in tank failures, the Ohio Fire Division is creating a voluntary registry of liquid storage tanks to help track and prevent similar failures.

Chemicals Involved

The failed tanks have held liquid fertilizers, such as ammonium phosphate, which are not considered hazardous and are not regulated by the U.S. Environmental Protection Agency. However, the failure of these tanks can damage nearby tanks containing hazardous substances and cause releases. In some cases, accidents have involved tanks containing hazardous materials like anhydrous ammonia and phosphoric acid, which are used to produce the fertilizer ammonium phosphate.

Increased Hazard During First Fill

According to American Petroleum Institute (API) Standard 653, "Tank Inspection, Repair, Alteration, and Reconstruction," tanks are more likely to fail when being filled to the maximum level for the first time. Additionally, hydrostatic testing places greater than usual stresses on a tank shell, and therefore presents another potential failure scenario. Facilities should be aware of the additional hazard associated with initial fill and hydrostatic testing, and develop procedures or policies to prevent or mitigate failures that may occur at these times.

Hazard Identification

Facilities should evaluate their storage tanks for potential catastrophic failure. Some of the factors to consider include:

- Manufacturer's record for quality workmanship.
- Evidence of weakened or defective welds.
- Signs of corrosion around the base and direct contact with ground and exposed to moisture.
- Exposure to high winds or frequent precipitation.
- Age of the tank.
- Close proximity to other storage tanks containing hazardous chemicals.

Hazard Reduction/Prevention

The failure of liquid storage tanks can stem from inadequate tank design, construction, inspection, and maintenance. Hazard reduction and prevention starts with good design and construction.

The risk to tanks already in service can be reduced through tank maintenance and weld inspection.

To minimize effects from possible tank failures, there should be a secondary containment such as a dike or a berm surrounding the tank.

Tank Design and Construction

The Fertilizer Institute (TFI) has published uniform industry inspection and maintenance guidelines for aboveground liquid fertilizer storage tanks. According to the TFI guidelines, liquid fertilizer storage tanks should be designed and constructed according to API Standard 650, "Welded Steel Tanks for Oil Storage," and inspections of existing tanks should be based on API-653, but with modifications for the unique characteristics of tanks storing liquid fertilizer. API-650 specifies an allowance for corrosion and for the specific gravity of the fertilizer liquid.

In each of the tank failures mentioned, welding has been the main cause of failure. To ensure durability and integrity, it is imperative that the tank is welded correctly. Several standards and specifications outline the proper techniques and procedures for welding, including API-653.

Operational Hazards and Maintenance

Tank buyers should insist on seeing the tank's inspection record. Although tanks should undergo a rigorous inspection by a recognized inspection authority before a manufacturer's job is complete, the tanks should still be closely inspected by the buyer prior to purchasing the unit. For liquid storage tanks, the most important item to look for is complete penetration and complete fusion of the welds joining shell plates.

Once a tank has been purchased, it becomes the tank owner's duty to regularly inspect the tank. Inspection intervals may be set by using a risk-based inspection theory, as indicated by API-653.

Various inspection methods can be used for those tanks already in service. Radiography is the technique applied to all tanks designed to API-650 to ensure that complete penetration and fusion of welded joints has occurred. Unfortunately, this procedure cannot detect poor mechanical properties in the welded regions.

This and other standards cover what types of joints must be checked by a radiograph, as well as the number of tests that must be done.

Additional inspections may be done visually or by several other methods. A vacuum box can identify localized problems.

The vacuum box, approximately 6 inches by 30 inches, is tightly sealed to the tank surface, and pressure is applied. Automated ultrasonic testing can be applied to all shell welds to examine for cracks, fusion, penetration, and porosity with greater resolution than radiography. It is also now possible to conduct floor scanning while the tank is full.

Combined with chemical analysis and hardness testing, field replication can assess the toughness, or resistance to brittle failure of a weldment.

If damage is found during an inspection, this needs to be assessed in accordance with the methodology described in API Std 5791/ASME FFS-1 "Fitness for Service."

Any tanks that do not meet the acceptance requirements set by API Std 579-1/ASME FFS-1 should be repaired or replaced.

Steps for Safety

Here are some additional ways to prevent rupture of liquid storage tanks:

- Realize the inherent risk of using and maintaining any storage tanks.
- Ensure that employees are aware of the hazards associated with the failure of a liquid storage tank.
- Avoid overfilling tanks.
- Perform regular inspections of tanks. Be sure to look for all possible risks.
- Follow up on problems identified during inspections by conducting repairs or, if necessary, replacing the tank.
- Replace, repair, or modify any and all tanks not meeting the standards set forth in API-Std 579-1/ASME FFS-1 methodology.
- Be on the alert for new tank regulations, standards, or recommended practices.
- Locate storage tanks and design and construct their secondary containment systems so as to separate the contents of a leaking or collapsing tank from the rest of the facility and to prevent any leakage from going offsite.
- Develop an emergency plan that addresses a catastrophic tank failure.
- Identify the manufacturers of the tanks on the property, being careful to identify any tanks built by either company mentioned in this alert. NOTE: If tanks were manufactured by Carolyn Equipment Company or Nationwide Tanks of Hamilton, take the following actions immediately:
  - A close external inspection should be made for leaks, corrosion, or any anomalies in the surface of the tank. Vent(s) should be checked for any blockages by foreign materials, such as snow or ice. The majority of the failures have occurred during the winter months, when steel becomes more brittle and when vents can become blocked by snow and ice. If liquid is drawn out of the tank when vents are plugged or restricted, a vacuum may be pulled on the tank causing it to collapse inward.
  - If you find evidence of leakage or corrosion during the inspection, the tank should be taken out of service and if possible, drained.
  - If there is no evidence of leakage or corrosion, arrange for an external evaluation by a qualified inspection agency.
  - Depending on the results of the evaluation, arrange for an internal inspection immediately or within the year.

Information Resources

References with information about the hazards of catastrophic storage tank failures and methods of minimizing them are listed below. Regulations potentially applicable to storage tanks and codes and standards that may be relevant are also included. A Chemical Safety Alert on catastrophic fires and explosions in storage tanks is available at: http://www.epa.gov/emergencies/docs/chem /cat-tnks.pdf.

Statutes and Regulations

- Clean Air Act Section 112(r)(1) – General Duty
- EPA's Risk Management Program Rule [40 CFR 68]
- OSHA Process Safety Management Standard [29 CFR 1910.119]
- EPA Spill Prevention, Control and Countermeasure Plan regulations [40 CFR 112]

Investigation Reports and Safety Videos

The U.S. Chemical Safety and Hazard Investigation Board (CSB) is an independent federal agency charged with investigating industrial chemical accidents. The CSB conducts root cause investigations of chemical accidents at fixed industrial facilities, publishes investigation reports, produces safety videos, and makes recommendations to plants, regulatory agencies, industry organizations, and labor groups:

- Investigation Report: Allied Terminals, Inc. – Catastrophic Tank Collapse, Report No. 2009-03-I-VA

Codes and Standards

The Fertilizer Institute (TFI) has published guidelines for inspection and maintenance of aboveground liquid fertilizer storage tanks:

- Aboveground Storage Tanks of Liquid Fertilizer: Recommended Inspection Guidelines
- The Fertilizer Institute 820 First Street, N.E., Suite 430 Washington, DC 20002
- The American Petroleum Institute (API) has tank standards and guidelines on safe welding:
- API Standard 579-1/ASME FFS-1 – Fitness for Service
- API Standard 620 – Design and Construction of Large, Welded, Low-Pressure Storage Tanks
- API Standard 650 – Welded Steel Tanks for Oil Storage
- API Standard 653 – Tank Inspection, Repair, Alteration, and Reconstruction

CHEMICAL SAFETY ALERT: Preventing Worker Injuries and Deaths from Explosions in Industrial Ethylene Oxide Sterilization Facilities

HOME

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ATTENTION WORKERS!

Explosions may result from improper venting of ethylene oxide into oxidizing emission control devices (OECDs).

Workers should take the following steps to protect themselves while working in ethylene oxide (EtO) sterilization facilities:

Prevent overfeeding of the OECD

- Make sure that all interlocks and other safeguards are in place before sterilization begins.
- Periodically wash or vent sterilized products that sit idle in a sterilizer or aeration room to prevent EtO buildup.
- Monitor EtO concentrations in the sterilizer before the back vents are activated to avoid venting high EtO concentrations to the oxidizing emission control device (OECD).
- Vent confined spaces such as the sterilizer and the aeration room to the outside after a power loss.
- Do not purge EtO lines to an OECD.
- Perform regular preventive maintenance.
- Obtain management approval before changing the process or safety interlocks.

Store and handle EtO properly

- Store EtO in tightly closed cylinders or tanks in a cool, shaded, well-ventilated, explosion-proof area.
- Do not smoke at work.
- Do not use electrical devices or create open flames where EtO is handled, used, or stored.
- Use nonsparking tools when opening or closing metal containers of EtO or whenever EtO might be present.
- Keep containers individually bonded and grounded to the earth when liquid EtO is poured or transferred.

Deal with leaks and spills

- Leave a leak or spill area immediately.
- If a catastrophic or large release of EtO occurs, do not enter the area. Evacuate the building and notify the fire department immediately.
- Do not enter an area where there is a small EtO leak until you have put on personal protective equipment (PPE), including a self-contained breathing apparatus (SCBA) that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode.
- Do not use an SCBA unless you have received proper training and are current on its safe use.

Be prepared for rescue

- Know emergency rescue steps and where emergency equipment is located.
- Do not participate in emergency response without an SCBA and proper training. If you do not have an SCBA and proper training, let the local fire department conduct the rescue.
- Before rescuing anyone in a leak or spill area, notify another person and put on an SCBA. Do not use a canister-type respirator for emergency response.
- If someone stops breathing because of EtO inhalation, immediately remove the person from the exposure area and perform cardiopulmonary resuscitation (CPR) while someone else calls for medical help. Keep the victim warm.

Prevent skin and eye contact

- If liquid EtO contacts your skin, rinse it immediately under a heavy shower. Remove any contaminated clothing. Get medical attention.
- If EtO gets into your eyes, flush them immediately with a steady stream of water for at least 15 minutes. Lift the upper and lower eyelids and direct the stream of water under the eyelids. Get medical attention.
- Do not wear contact lenses in an area where EtO exposure might occur.

Use respiratory protection and other PPE

- Use the respiratory protection recommended in the complete Alert during emergencies, maintenance work, vessel cleaning, and whenever engineering controls cannot be implemented. (See ordering information for the Alert at the bottom of this sheet.)
- Use PPE such as chemical-resistant gloves, eye-splash protection, and liquid-tight protective clothing whenever liquid EtO might be present.

ATTENTION EMPLOYERS!

Explosions may result from improper venting of ethylene oxide into oxidizing emission control devices (OECDs).

Employers should take the following steps to prevent ethylene oxide (EtO) explosions:

Analyze and develop written procedures

- Conduct a process hazard analysis that emphasizes safety procedures for the entire sterilization system.
- Establish written procedures to cover all steps of EtO sterilization.
- Evaluate the advantages and disadvantages of each control technology.

Prevent overfeeding of the OECD

- Make sure that all interlocks and other safeguards are in place before sterilization begins.
- Periodically wash or vent sterilized products that sit idle in a sterilizer or aeration room to prevent EtO buildup.
- Monitor EtO concentrations in the sterilizer before the back vents are activated to avoid venting high EtO concentrations to the oxidizing emission control device (OECD).
- Install an OECD bypass for emergency use if allowed by State or local environmental regulations.
- Vent confined spaces such as the sterilizer and the aeration room to the outside after a power loss.
- Do not purge EtO lines to an OECD.
- Perform regular preventive maintenance.

Store and handle EtO properly

- Store EtO in tightly closed cylinders or tanks in a cool, shaded, well-ventilated, explosion-proof area.
- Do not permit smoking, use of electrical devices, or open flames where EtO is handled, used, or stored.
- Use nonsparking tools when opening or closing metal containers of EtO or whenever EtO might be present.
- Keep containers individually bonded and grounded to the earth when liquid EtO is poured or transferred.

Deal with leaks and spills

- Make sure that all workers leave a leak or spill area immediately.
- If a catastrophic or large release of EtO occurs, do not permit workers to enter the area. Evacuate the building and notify the fire department immediately.
- If a small leak occurs, do not permit workers to enter the area until they have put on personal protective equipment (PPE), including a self-contained breathing apparatus (SCBA).
- Do not permit workers to use SCBAs unless they have received proper training and are current on their safe use. Employers should identify and use the controls and procedures

Implement engineering controls

- Provide an abort cycle (with diluent) in the sterilizer control system.
- Establish and follow a cycle approval process for all test cycles.
- Provide limited access to override controls.
- Eliminate back vents through appropriate equipment and cycle design.
- Interlock the sterilizer door to prevent opening before the cycle is complete.
- Interlock the gas inlet (shut-off) valve.
- Make sure that regular preventive maintenance is performed.
- Install a flow-limiting device on the vacuum pump inlet (controls or orifice).
- Install valve position sensors on critical valves.
- Install real-time area monitors that will alert workers to unsafe EtO concentrations.
- Use redundancies or other safeguards on all critical valves.
- Use damage control devices in the EtO supply lines and the OECD feed lines to limit explosion damage.
- Make sure that all other equipment has proper safety controls.

Install emergency equipment

- Equip the facility with a type 2, 3 carbon dioxide or dry chemical fire extinguisher. Train workers annually in their safe use.
- Provide emergency eye-wash facilities.

Provide respiratory protection and PPE

- Provide workers with the respiratory protection recommended in the complete Alert during emergencies, maintenance work, vessel cleaning, and whenever engineering controls cannot be implemented.
- Provide workers with chemical-resistant gloves, eye-splash protection, and liquid-tight protective clothing whenever liquid EtO might be present.

Provide training

- Fully train all operations, maintenance, and engineering workers in the dangers of EtO-rich evacuations to an OECD.
- Train all workers who will be responding to emergencies (including managers and supervisors) in the proper use of

safety equipment and in emergency procedures for all EtO plant operations.

Prepare workers for rescue

- Make sure that workers know emergency rescue steps and where emergency equipment is located. Be sure that they comply with Occupational Safety and Health (OSHA) regulations.
- Do not permit workers to participate in emergency response without SCBAs and proper training. If workers do not have SCBAs and proper training, let the local fire department conduct the rescue.
- Design, develop, and practice emergency evacuation and rescue procedures.

The National Institute for Occupational Safety and Health (NIOSH), the U.S. Environmental Protection Agency (EPA), and the Ethylene Oxide Sterilization Association (EOSA) request assistance in preventing explosions at industrial ethylene oxide (EtO) sterilization facilities and EtO repackaging plants. EtO is a flammable gas. During sterilization procedures, EtO can easily form explosive mixtures when it is vented to certain types of emission control devices such as catalytic oxidizers.

Between 1994 and 1998, EtO was involved in 10 explosions at industrial EtO sterilization facilities and EtO repackaging plants. One of these explosions caused 1 death and 59 injuries among workers. All of these incidents caused damage to the plants, most of which used catalytic oxidizers to control EtO emissions.

This Alert informs owners, managers, supervisors, engineers, safety professionals, and workers about the explosions, injuries, and deaths that may occur at industrial EtO sterilization facilities and repackaging plants. Steps are recommended for preventing these explosions.

BACKGROUND

According to EPA, EtO is among the top 3% of high-volume chemicals produced in the United States. Less than 1% of all EtO produced in the United States is used as an industrial sterilant or fumigant [LaMontagne et al. 2007]. For sterilization applications, EtO is supplied in cylinders as a pure liquid under pressure or mixed with other carriers.

Industry has long recognized the value of safe, effective, and efficient sterilization using EtO. The health care and food industries depend on the EtO sterilization industry for sterile products. More than 50% of all sterile medical devices sold are sterilized using EtO [Kroschwitz and Howe-Grant 1994].

Oxidizing emission control devices (OECDs) are integrated into some sterilization systems. They remove or destroy small amounts of EtO remaining in a vent stream through oxidation or burning. In most cases, OECDs replace acidified wet scrubber systems that are slightly less efficient in controlling low-concentration EtO emissions (see Appendix B). However, the use of OECDs alone increases the potential for fire and explosion. Most recent explosions in the EtO sterilization industry are associated with OECDs.

Since EtO vapors are highly flammable and explosive, the EtO concentration in the vent stream to the OECD must remain well below the flammable or explosive range because thermal or catalytic OECDs provide a source of ignition that could trigger an explosion in the vent system.

Nearly all such explosions are associated with overfeeding of the system. Such overfeeding occurs when

- a back vent is opened while a high concentration of EtO is in the sterilizer,
- no valve is used to control the flow rate of EtO to the OECD, and
- an EtO-rich stream reaches the device.

Overfeeding the OECD usually involves one or more of the following: (1) opening a sterilizer door that triggers back vent operation, (2) using a manual switch to trigger back vent operation, or (3) triggering back vent operation through a sterilizer controller (see Appendices C and D for more information about overfeeding). The high flow rate of the back vent exhausts could emit EtO at a rate that exceeds the safe design limits of the OECD if a valve or orifice is not used to control the flow of EtO or the EtO concentration sent to the OECD.

Properties of EtO

EtO ($C2H4O$, epoxyethane, oxirane) is a colorless gas at room temperature with an ether-like odor at concentrations above 500 to 700 parts per million (ppm). The odor threshold for EtO is 260 ppm. EtO has a vapor density of 1.49 and is thus approximately 1.5 times heavier than air [Clayton and Clayton 1993]. The boiling point of EtO is 51 °F, and the liquid has a flash point of 0 °F. The gas has an autoignition temperature of 805 °F. The vapor pressure of EtO is 1,095 mm Hg. EtO is soluble in water and reacts with acidified water to produce ethylene glycol.

This process is one method for controlling EtO emissions. EtO is reactive with strong acids, alkalis and oxidizers, chlorides of iron, aluminum or tin, and oxides of iron and aluminum [Lewis 1996]. Highly flammable, EtO poses a dangerous fire and explosion risk. The flammability limits in air are 3% (30,000 ppm) to 100% [Lewis 1996]. Pure EtO can be ignited in the absence of air. EtO is more dangerous than hydrogen and should be treated with the same care as hydrogen and acetylene.

Once ignited, it can flash back to the fuel source with velocities of 1,800 to 2,400 m/sec.

EtO Health Effects

EtO irritates the eyes and skin; it may also irritate mucous membranes and cause a strange taste in the mouth. EtO may cause allergies, adverse reproductive effects, and possibly asthma. At high concentrations, it can cause nausea and vomiting [LaMontagne et al. 2007; LaMontagne and Kelsey 1998]. EtO can be detected by odor only when it has already reached the dangerous concentration of 260 ppm.

Olfactory fatigue may limit a person's ability to smell EtO, but perception at concentrations below the odor threshold may occur because of mucous membrane irritation and a peculiar taste in the mouth. In 1984, the Occupational Safety and Health Administration (OSHA) classified EtO as a carcinogen and regulated it as such EtO [29 CFR 1910.1047]. In 1994, the International Agency for Research on Cancer (IARC) classified EtO as a Group 1 human carcinogen [IARC 1994].

INDUSTRIAL STERILIZATION PROCESS

Although the sterilization process and emission controls vary greatly among facilities, most industrial sterilization processes involve placing the products to be sterilized in a large chamber, injecting the chamber with EtO, flushing the EtO out of the chamber, and removing the sterilized products.

Steps include product conditioning (preconditioning), sterilization, and sterilant gas removal (aeration). The sterilization stage consists of an initial purge, sterilant injection, sterilant gas dwell, and post-sterilization purge. Stages vary with the type of products to be sterilized and the equipment used.

In the typical process, EtO vapors from the sterilizer chamber and other areas of the facility are sent to an acidified wet scrubber before emission to the air. However, the scrubber may not keep the EtO concentration low enough to meet the emissions standard.

Furthermore, sterilizer operators are left with ethylene glycol solutions for disposal. Consequently, sterilizer operators have added OECDs either after or in place of the wet scrubber.

In OECD systems, EtO vent streams are mixed with dilution air to ensure that the EtO concentration that reaches the OECD is kept below 7,500 ppm (one-fourth of the 30,000-ppm lower flammability limit) or the manufacturers specification under normal operating conditions. A key factor in sterilizer operation is ensuring that workers are not exposed to toxic concentrations of EtO.

One feature of the sterilizer chamber is a back vent, which consists of a large diameter valve and a blower at the back of the sterilizer chamber.

The blower creates a large-volume air flow through the chamber when the chamber door is opened at the end of a sterilization cycle.

When this door is opened, the valve in the back vent automatically opens, and the OECD unit throttles up to capture and destroy EtO. This process keeps EtO concentrations below the OSHA permissible exposure limit (PEL) for workers who must enter the chamber to remove sterilized products.

SAFETY CONCERNS

Overfeeding increases the risk of EtO explosion. Possible causes for various types of overfeeding are listed here.

A. Overfeeding the OECD from back vents containing high concentrations of EtO
   Causes:
   1. The back vent was turned on with EtO-rich gas present because
      - safety interlocks were bypassed,
      - the EtO valve leaked,
      - the product degassed too long in the sterilizer after cycle completion, or
      - the computer system, controller, or instrumentation failed.
   2. The product was not adequately washed or flushed of EtO before the door was opened.
   3. The incorrect cycle was used for the product.
   4. The lower flammability limit sensors and the flow sensors had slow response times.
   5. Test cycles that explored process capability limits (resulting in an unexpected EtO-rich environment).

B. Overfeeding from vacuum pumps
   Causes:
   1. Too many vacuum pumps were operating.
   2. Discharges were misdirected.
   3. Incoming flows were not interlocked or controlled.
   4. EtO feed valves failed or malfunctioned.
   5. Safety interlocks were bypassed.

C. Overfeeding from lack of adequate dilution air
   Causes:
   1. Aeration exhaust or dilution source was lost.
   2. Makeup dilution was lost.

D. Overfeeding from other sources
   Causes:
   1. Spills or drum leaks occurred near vents to the OECD.
   2. No interlock was present between the EtO valve and the sterilizer.
   3. The air in-bleed valve failed or malfunctioned.
   4. Valves became stuck and resulted in misdirected flow.
   5. EtO cylinders were purged with EtO delivery valves in the wrong position.
   6. The upstream scrubber was operated improperly.
   7. The sterilizer control system was inadequate.
   8. Cabinet locks were not present, allowing easy access to the manual sterilizer switches.

CURRENT STANDARDS

NIOSH

The NIOSH recommended exposure limit (REL) for EtO is 0.1 ppm as an 8-hr time-weighted average (TWA) with a 10-min Ceiling limit of 5 ppm [NIOSH 1983]. NIOSH has determined that 800 ppm is the EtO concentration that is immediately dangerous to life and health (IDLH) [NIOSH 1994, 1997].

OSHA

The OSHA PEL for EtO is 1 ppm as an 8-hr TWA with a 15-min excursion limit of 5 ppm [29 CFR 1910.1047]. Because of OSHA regulations, back vents were installed to reduce worker exposure to EtO.

EPA

EPA has developed acute exposure guideline levels (AEGLs) for high-priority, acutely toxic chemicals. The AEGL is the concentration at or above which the general population could experience serious, long-lasting health effects or impaired ability to escape (because of health effects). The AEGL for EtO is 110 ppm for 1 hr [62 Fed. Reg. 58839 (1997)].

On December 6, 1994, EPA promulgated its final standard under the Clean Air Act (Subpart O—Ethylene Oxide Emissions Standards for Sterilization Facilities [40 CFR 63.360]). Because of public health concerns about EtO emissions to the air, this standard required that by December 6, 1997, all sterilization and fumigation facilities using more than 10 tons of EtO per year increase emission removal efficiency from 95% to 99% and add controls to certain vent streams.

Many facilities selected and installed OECDs to meet these requirements (see Appendix B for more information about emission control devices). When several facilities using EtO and OECDs experienced explosions, EPA delayed the compliance deadline for 3 consecutive years so that facilities could reassess the safety of their processes and emission control systems.

ACGIH

The American Conference of Governmental Industrial Hygienists (ACGIH) recommends for EtO a threshold limit value (TLV) of 1 ppm as an 8-hr TWA [ACGIH 1999].

AIHA

The American Industrial Hygiene Association (AIHA) writes emergency response planning guidelines (ERPGs) for toxic chemicals involved in emergency situations such as releases to the community.

The ERPG-2 for EtO is 50 ppm—the concentration below which nearly all persons can be exposed for up to 1 hour without experiencing irreversible or other serious health effects [AIHA 1998]. The ERPG-3 for EtO is 500 ppm—the concentration below which nearly all persons can be exposed for up to 1 hour without experiencing life-threatening health effects [AIHA 1998].

CASE REPORTS

The following case reports briefly describe the EtO explosions at sterilization or repackaging facilities.

Case 1

At an EtO sterilization facility, an operator noted an overfeed of EtO in one of the chambers during sterilization. The operator tried to correct the problem by adding dilution air and bringing the chamber to atmospheric pressure. When the front door of the sterilizer was opened, a valve opened at the back of the sterilizer (the back vent), causing EtO to bypass the wet scrubbers and go directly to the OECD.

An ignition occurred in the OECD on the roof of the facility. EtO gas in the ductwork flashed back and over-pressured the ductwork and the sterilizer. As a result, the roof of the building, walls, ductwork, and OECD were severely damaged. No workers were injured, and no chemicals were released to the environment [EPA 1997a].

Case 2

An explosion occurred recently at a commercial EtO sterilization facility. This facility handles the bulk sterilization of medical kits using 100% EtO. The sterilization chambers are connected to two 400-lb EtO cylinders. Before the incident, the facility had replaced an acidified wet scrubber system with a new OECD to control EtO emissions.

During a test run of the OECD at Chamber 1, an explosion occurred following primary evacuation of the chamber—about 15 sec after the back vent fan exhausted the chamber. Later it was determined that the ignition had occurred at the OECD. The ensuing explosion caused a flame front from the oxidizer back to the mixing plenum, completely destroying the plenum box. The explosion continued upstream toward the sterilizer, blowing out 14-gauge steel ducting along the way. The door blew off the sterilizer and shot through the building, damaging the de-gas room. The 50,000-lb chamber was moved 3ft off its foundation. About 7% EtO (15 to 20 lb) was in the sterilizer at the time of the explosion. No worker injuries were reported [EPA 1997b].

Case 3

At an EtO repackaging facility, an explosion occurred during a test run on the inside of a thermal oxidizer. Testing probes had been placed at the inlet and outlet sides of the thermal oxidizer. At the beginning of the test, the inlet concentration was in the expected range of 1,000 ppm EtO.

But just before the explosion, the inlet EtO concentration rose to 35,000 ppm. Within 16 sec, the explosion occurred in the thermal oxidizer. The thermal oxidizer bed and production equipment were damaged, and the filling room was destroyed. No worker injuries were reported [EPA 1998].

CONCLUSIONS

All incidents described in the case reports occurred during operations in which an OECD was used as the only emission control device (that is, when acidified wet scrubbers were not used or were bypassed). Sterilization facilities using an OECD typically have the chamber door interlocked with the back vent system to protect workers from EtO exposure when they are loading or unloading products.

When the back vent system is activated, it vents a high-volume flow directly to the OECD. The intention is to activate the back vent only when the concentration of EtO in the chamber is well below the lower flammability limit (3% or 30,000 ppm EtO) —typically in the range of several hundred parts per million.

OECDs are designed to operate at concentrations well below the lower flammability limit to avoid igniting the sterilant gas. Some EtO explosions have been caused by incomplete evacuation cycles, and others have been caused by improper operation. In all cases, overfeeding resulted when a high concentration of EtO was inadvertently sent to the OECD.

Investigation and analysis of the incidents described here and a review of the sterilization process by EOSA and EPA resulted in the following conclusions:

1. Fires and explosions result when sterilizer OECDs are overfed with high concentrations of EtO.
2. Current procedures for aborting the EtO sterilizer cycle are deficient when OECDs are used.
3. Current safety systems for EtO sterilization processes are deficient when OECDs are used.
4. When OECDs are used as the only emission control device (that is, when acidified wet scrubbers are not used or are bypassed), the risk of fire and explosion is greatly increased.

RECOMMENDATIONS

Workers

Workers should take the following steps to prevent EtO explosions:

1. Prevent overfeeding of the OECD
    - Make sure that all interlocks, safeguards, and other preventive measures are in place before a sterilization cycle begins.
    - Periodically wash or vent sterilized products that sit idle in a sterilizer or aeration room to prevent EtO buildup.
    - Monitor EtO concentrations in the sterilizer before the back vents are activated to avoid exhausting high concentrations of EtO through the back vent to the OECD.
    - Vent confined spaces such as the sterilizer and the aeration room to the outside after a power loss to prevent EtO buildup and overfeeding of the OECD.
    - Do not purge EtO lines to an OECD: an incorrect valve lineup or a leak in the storage area is likely to lead to overfeeding.
    - Perform regular preventive maintenance.
    - Obtain management approval before changing the process or safety interlocks.

    See Appendix C for more details about steps to prevent overfeeding of the OECD.
2. Store and handle EtO properly
    - Store EtO in tightly closed cylinders or tanks in a cool, shaded, well-ventilated, explosion-proof area. Store cylinders or tanks away from heat, sparks, flames, strong oxidizers, alkalines, acids, and acetylide-forming metals such as copper, silver, mercury, and their alloys. The storage room should be explosion-proof according to the definition of the National Fire
    - Protection Association (NFPA 560) [NFPA 1995].
    - Do not smoke, use electrical devices, or create open flames where EtO is handled, used, or stored.
    - Use nonsparking tools when opening or closing metal containers of EtO or whenever EtO might be present.
    - Keep containers individually bonded and grounded to the earth when liquid EtO is poured or transferred.
3. Deal with leaks and spills
    - Leave a leak or spill area immediately.
    - If a catastrophic or large release of EtO occurs, do not enter the area. Evacuate the building and notify the fire department immediately. Note: A large release of EtO is any release other than the type of small leak that would occur (for example) from a loose connection or valve. A catastrophic release is one that would occur if (for example) a forklift pierced a 400-lb EtO cylinder.
    - Do not enter an area where there is a small EtO leak until you have put on personal protective equipment (PPE), including a self-contained breathing apparatus (SCBA) that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode.
    - Do not use an SCBA unless you have received proper training and are current on its safe use.
4. Be prepared for rescue
    - Know emergency rescue steps and where emergency equipment is located. Be sure that you comply with OSHA regulations regarding emergency response, PPE, and rescue in confined spaces [29 CFR 1910.38, 1910.120(q), 1910.132138, 1910.146].
    - Do not participate in emergency response without an SCBA and proper training. If you do not have an SCBA and proper training, let the local fire department conduct the rescue.
    - Before rescuing anyone in a leak or spill area, notify another person and put on an SCBA. Do not use a

canister-type respirator for emergency response; such respirators provide no protection in case of leaks or spills.
    - If someone stops breathing because of EtO inhalation, immediately remove the person from the exposure area and perform cardiopulmonary resuscitation (CPR) while someone else calls for medical help. Keep the victim warm.
5. Prevent skin and eye contact
    - If liquid EtO contacts your skin, rinse it immediately under a heavy shower. Remove any contaminated clothing. Get medical attention.
    - If EtO gets into your eyes, flush them immediately with a steady stream of water for at least 15 min. Lift the upper and lower eyelids and direct the stream of water under the eyelids. Get medical attention.
    - Do not wear contact lenses in an area where EtO exposure might occur.
6. Use respiratory protection and other PPE
    - Use appropriate respiratory protection during emergencies, maintenance work, vessel cleaning, and whenever engineering controls cannot be implemented. At a minimum, such protection must comply with OSHA requirements in 29 CFR 1910.1047 and 1910.134.
    - Use PPE such as chemical-resistant gloves, eye-splash protection, and liquid-tight protective clothing whenever liquid EtO might be present. At a minimum, such equipment must comply with OSHA requirements [29 CFR 1910.1047].

Employers

The following list of recommendations presents engineering controls and safety procedures for preventing fires and explosions at EtO sterilization and repackaging facilities. This list was identified by the EOSA Safety Committee and was revised by NIOSH. The list is not all-inclusive and may not be equally applicable to all sterilization and repackaging facilities.

Employers should identify and use the controls and procedures that are relevant to their facilities. They should also be aware that no fail-safe control technique exists to guarantee that fires and explosions will not occur at their facilities.

1. Analyze and develop written procedures
    - Conduct a process hazard analysis that emphasizes safety procedures for the entire sterilization system (chambers, aeration rooms, EtO delivery and evacuation, and emission control). This analysis will minimize the possibility that flammable concentrations of EtO will enter the oxidizer (see Appendix E).
    - Establish written procedures to cover all steps of EtO sterilization.
    - Evaluate the advantages and disadvantages of each control technology.
2. Prevent overfeeding of the OECD
    - Prevent overfeeding of the OECD by following the steps listed.
    - Install an OECD bypass for emergency use if allowed by State or local environmental regulations.
3. Store and handle EtO properly
    - Store EtO in tightly closed cylinders or tanks in a cool, shaded, well-ventilated, explosion-proof area. Store cylinders or tanks away from heat, sparks, flames, strong oxidizers, alkalines, acids, and acetylide-forming metals such as copper, silver, mercury, and their alloys.
        - Make sure that the storage room is explosion-proof according to the definition of the National Fire Protection Association (NFPA 560) [NFPA 1995].
        - Make sure that the storage room meets National Electrical Code requirements to prevent ignition and explosion.
    - Do not permit smoking, use of electrical devices, or open flames where EtO is handled, used, or stored.
    - Use nonsparking tools when opening or closing metal containers of EtO or whenever EtO might be present.
    - Keep containers individually bonded and grounded to the earth when liquid EtO is poured or transferred.
4. Deal with leaks and spills
    - Make sure that all workers leave a leak or spill area immediately.
    - If a catastrophic or large release of EtO occurs, do not permit workers to enter the area. Evacuate the building and notify the fire department immediately. Note: A large release of EtO is any release other than the type of small leak that could occur (for example) from a loose connection or valve. A catastrophic release is one that would occur if (for example) a forklift pierced a 400-lb EtO cylinder.
    - If a small leak occurs, do not permit any worker to enter the area until he or she has put on PPE, including an SCBA that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode.
    - Do not permit workers to use SCBAs unless they have received proper training and are current on their safe use.
5. Implement engineering controls
    - Provide an abort cycle (with diluent) in the sterilizer control system.
    - Establish and follow a cycle approval process for all test cycles.
    - Provide limited access to override controls.
    - Eliminate back vents through appropriate equipment and cycle design.

- Interlock the sterilizer door to prevent opening before the cycle is complete.
- Interlock the gas inlet (shut-off) valve.
- Make sure that regular preventive maintenance is performed.
- Install a flow-limiting device on the vacuum pump inlet (controls or orifice).
- Install valve position sensors on critical valves.
- Install real-time area monitors that will alert workers to unsafe EtO concentrations.
- Use redundancies or other safeguards on all critical valves. For example, install redundant control valves on the EtO line (use doubleblock valves with leak check).
- Use damage control devices to limit explosion damage:
    - install flow-control check valves in the EtO supply lines.
    - install flame arresters and check valves in OECD feed lines from the vacuum pumps to eliminate flame propagation back into and throughout the system.
- Make sure that all other equipment has proper safety controls.

6. Install emergency equipment
    - Equip the facility with a type 2, 3 carbon dioxide or dry chemical fire extinguisher.
    - Train workers annually in their safe use.
    - Provide emergency eye-wash facilities.
7. Provide respiratory protection and PPE
    - Provide workers with appropriate respiratory protection for use during emergencies, maintenance work, vessel cleaning, and whenever engineering controls cannot be implemented. At a minimum, such protection must comply with OSHA requirements in 29 CFR 1910.1047 and 1910.134.
    - Provide workers with chemical-resistant gloves, eye-splash protection, and liquid-tight protective clothing whenever liquid EtO might be present. At a minimum, such equipment must comply with OSHA requirements [29 CFR 1910.1047].
8. Provide training
    - Fully train all operations, maintenance, and engineering workers in the dangers of EtO-rich evacuations to an OECD.
    - Train all workers who will be responding to emergencies (including managers and supervisors) in the proper use of safety equipment and in emergency procedures for all EtO plant operations. Training should include
        - instruction about spill and control procedures,
        - information about the OSHA hazard communication standard [29 CFR 1910.1200],
        - training in the use of SCBAs and other PPE, and
        - instructions in following OSHA requirements for preventing EtO exposure and for decontamination [29 CFR 1910.1047].
9. Prepare workers for rescue
    - Make sure that workers know emergency rescue steps and where emergency equipment is located. Be sure that they comply with OSHA regulations regarding emergency response, PPE, and rescue in confined spaces [29 CFR 1910.38, 1910.120(q), 1910.132138, and 1910.146]. Note: 29 CFR 1910.119 applies if a facility possesses 5,000 lb EtO or more at any given time.
    - Do not permit workers to participate in emergency response without SCBAs and proper training. If workers do not have SCBAs and proper training, let the local fire department conduct the rescue.
    - Design, develop, and practice emergency evacuation and rescue procedures.

Manufacturers

Manufacturers should develop reliable, high-speed EtO monitoring sensors to be installed and integrated into the EtO sterilization process.

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APPENDIX A: ABBREVIATIONS AND GLOSSARY

Abbreviations

- ACGIH: American Conference of Governmental Industrial Hygienists
- AEGL: acute exposure guideline level
- AIHA: American Industrial Hygiene Association
- Btu: British thermal unit

- CFR: Code of Federal Regulations
- CPR: cardiopulmonary resuscitation
- EOSA: The Ethylene Oxide Sterilization Association
- EPA: U.S. Environmental Protection Agency
- ERPG: emergency response planning guideline
- EtO: ethylene oxide
- °F: degrees Fahrenheit
- Fed. Reg.: Federal Register
- Ft: foot (feet)
- HAZOP: hazardous operational study
- Hr: hour(s)
- IARC: International Agency for Research on Cancer
- IDLH: immediately dangerous to life and health
- L: liter(s)
- Lb: pound(s)
- M: meter(s)
- Mg: milligram(s)
- Min: minute(s)
- mm Hg: millimeters of mercury
- NESHAP: National Emission Standards for Hazardous Air Pollutants
- NFPA: National Fire Protection Association
- NIOSH: National Institute for Occupational Safety and Health
- OECD: oxidizing emission control device
- OSHA: Occupational Safety and Health Administration
- PEL: permissible exposure limit
- PPE: personal protective equipment
- Ppm: parts per million
- REL: recommended exposure limit
- SCBA: self-contained breathing apparatus
- Scfm: standard cubic feet per minute
- Sec: second(s)
- STEL: short-term exposure limit
- TLV: threshold limit value
- TWA: time-weighted average
- %: percentage

Glossary

- Algorithm: The “logic” programmed into a computer that controls the process on the basis of inputs from sensors, switches, or other devices. A typical algorithm may control how many pumps can be operating or when a valve is turned on or off or is repositioned.
- Back vent: A large-diameter valve and blower at the back of the sterilizer. The vent creates a high-volume evacuation of the sterilizer when the sterilizer entrance door is opened to reduce operator EtO exposure during unloading. Most back vents pull in air at a rate equal to one sterilizer volume per minute. Most back vents are automatically triggered when an operator opens or attempts to open the sterilizer door, regardless of conditions within the chamber.
- Cycle: Treatment of a product with EtO in a sterilizer designed to render the product free of all forms of viable microorganisms. EtO concentrations in the sterilizer range between 100 and 800 mg/L or between 5.5% and 44.4%. The cycle includes removing air from the sterilizer, conditioning with temperature and humidity (if used), injecting EtO, exposing the product to EtO, removing EtO, and flushing the sterilizer. A diluent gas (such as nitrogen) is generally injected and evacuated as part of air removal at the beginning of the cycle and during flushing after EtO exposure. These diluent injections and evacuations have become prominent safety additions for OECD operation because they decrease the flammability of the environment within the sterilizer. After completion of the cycle, the back vent is run before unloading. (Note: Cycle parameters vary widely among facilities. Most facilities operate several different cycles, depending on customer needs.)
- Emission control device and OECD: A device designed to reduce the EtO content in the exhaust stream (source). Generally, OECD refers to an oxidizing emission control device (catalytic or thermal) (see also Appendix B).
- Exhaust stream: The sum of all gases exiting from the facility (source) that is directed to the inlet of the emission control device or OECD.
- Gas delivery system: The system that delivers EtO from its protective storage drum through automated valves into a vaporizer. The vaporizer converts the liquid EtO to gas as it is injected into the sterilizer. The correct amount of EtO injected may be determined by measuring the change in weight of the EtO tank, by measuring the change in pressure within the sterilizer, or both.
- Interlock: A mechanical device or computer algorithm that ties one action into another action (response). An interlock may be as simple as a mechanical limit switch that is tied to a motor starter, or it may be a computer program that electrically or mechanically “locks out” a valve or motor until certain conditions have been met. Effective interlocks provide a safer, but not foolproof, method of assuring that an objective or procedure is met before an action is taken. A complete review of all normal and abnormal operating conditions (using a hazard analysis) is necessary when assessing an interlock’s effectiveness. Startup and testing of safety-related interlocks is important and requires extreme caution.
- Lower flammability limit: The lowest concentration of a substance in air that will sustain combustion when elevated to its ignition temperature. The lower flammability limit for EtO is about 3% or 30,000 ppm at standard conditions. This limit can be lower under elevated temperature or pressure. Note that EtO is also flammable at 100%, indicating that oxygen is not required to have a flammable event.
- Manual intervention: The ability of an operator to manually override the sterilizer controller by (1)

accessing the sterilizer controller and manually initiating an action before completion of a cycle step or (2) opening the sterilizer door (and thus triggering the operation of a back vent) before completion of the cycle.

- Operator: A person who is responsible to initiate, monitor, and control a cycle. The operator may manually intervene and may also load and unload product from the sterilizer.
- Overfeeding: Introducing EtO to an emission control device or OECD at a rate greater than the manufacturers design limitation.
- Sterilizer: A sealed chamber in which a product is subjected to a cycle that renders it free of all forms of viable microorganisms. A sterilizer generally consists of a chamber with one or more doors, a vacuum pump, a back vent valve with a blower, a heating system, a gas delivery system, a sterilizer controller, and various parameter gauges and instruments.
- Sterilizer controller: A computer system that controls and monitors the cycle. The system controls (1) the appropriate valves, pumps, blowers, and heaters according to a planned sequence (algorithm) and (2) rates of pressure changes to achieve the desired environment within the sterilizer. The system monitors sterilizer pressure, sterilizer temperature, possibly EtO cylinder weight and EtO temperature, evacuation rates, and vacuum depths. Redundant sensors or methods contribute to increased reliability of operating parameters.
- Vacuum pump: A device that withdraws gases from a sealed sterilizer. It generally consists of a liquid ring pump capable of pulling a vacuum in a sealed sterilizer. Vacuum pumps are rated in cubic feet per minute at the pump inlet. Most pumps have a rated capacity between 0.1 and 0.25 sterilizer volumes per minute.

APPENDIX B: TYPES OF EMISSION CONTROL DEVICES

The following describes the different technologies used to treat EtO emissions and the common ranges of operation for these control devices.

Wet Scrubbers

Wet scrubbers have been installed on many sterilizer primary vacuum pump discharges. A wet scrubber absorbs EtO into a recirculating water-acid solution, converting the EtO to ethylene glycol. It operates effectively with higher concentrations of EtO in air or nitrogen. The most common size for sterilizer primary discharges (vacuum pumps) is between 200 and 400 standard cubic feet per minute (scfm) (600 to 600,000 ppm EtO). Wet scrubbers can have capacities of up to 20,000 scfm, though these are generally for lower EtO concentrations (50 to 8,000 ppm). Wet scrubbers operate at ambient temperature. Overfeeding generally results in recovery efficiencies below the required 99% NESHAP but is generally not detrimental to the system.

Catalytic OECDs

Catalytic OECDs operate by oxidizing or burning EtO to form the end products of carbon dioxide, water, and heat. The inlet gas is preheated to the needed activation temperature of the catalyst, about 300 °F. The preheating is generally accomplished with a direct-fired burner, indirect-fired burner, steam coil, or electric element. The oxidation causes the temperature in the catalyst to rise. EtO has a fuel value of about 12,000 British thermal units (Btu)/lb. Catalytic OECDs can have up to 30,000 scfm rated flow capacity. The most common sizes currently in use fall between 6,000 and 14,000 scfm. The maximum inlet concentration of EtO should be limited to 3,000 to 6,000 ppm or to the manufacturers specification.

Overfeeding produces even higher temperatures in the catalyst and gas stream, potentially damaging the catalyst or shortening its useful life. If the inlet gas has an EtO concentration greater than the explosive limit, an explosion can result. If the inlet gas has a concentration above the explosive limit, an explosion can result either from the high temperature of the catalyst or from the direct-fire burner. Exhaust gases containing EtO should never be passed through a catalytic OECD under cold conditions, because the catalyst will adsorb and destroy the EtO. The exothermic EtO destruction will increase the temperature of the system and an explosion may result.

Thermal OECDs

Thermal OECDs operate with the same end result as the catalytic OECDs. They operate without a catalyst at a higher temperature than catalytic OECDs and generally have a higher EtO concentration limit. Inlet concentration limits vary by manufacturer. Recuperative thermal OECDs and regenerative thermal OECDs provide heat recovery for facility uses. Recuperative and regenerative thermal OECDs have flow rates of up to 20,000 and 100,000 scfm, respectively.

Thermal OECDs provide an ignition source for vapor containing concentrations greater than the lower flammability limit of EtO.

Dry-Bed Reactors

Dry-bed reactors eliminate EtO by causing it to bind permanently to the reactant. They operate at ambient temperatures and do not require preheating of the exhaust gas. They are most commonly used for removing low concentrations of EtO from high-volume exhaust streams.

Occasionally, they are used for emergency containment of a catastrophic event (emergency responses) where they handle a short burst with a high concentration of EtO. Dry-bed systems can be furnished for any flow capacity. Typical operating concentrations vary from 5 to 300 ppm with spikes up to 10,000 ppm. Overfeeding these reactors increases the temperature and may cause a fire or explosion.

APPENDIX C: PREVENTIVE MEASURES AND SAFETY CONSIDERATIONS

The EOSA Safety Committee has identified the following preventive measures and safety considerations for the sterilization process. The list was revised by NIOSH.

A. Interlock the sterilizer door and gas valve.
   Mechanically or electrically lock the gas valve out of operation if the sterilizer door is opened. This measure prevents an EtO-rich environment from entering a sterilizer while a cycle is not running.

B. Use interlocks to prevent the opening of a sterilizer door before a cycle is complete.
   Be sure interlocks, safeguards, or other preventive measures are in place to prevent the opening of a sterilizer door during a sterilization cycle. Since several sterilizer installations have the back vent interlocked with the sterilizer door for worker safety considerations, the door must remain shut when EtO-rich concentrations are present in the chamber.

C. Wash or vent periodically while the sterilizer is idle with the product.
   If a sterilized product sits idle in a sterilizer or aeration room, wash or vent it periodically to prevent buildup of EtO.

D. Monitor the EtO concentration in the sterilizer before back vents are activated.
   Use direct analysis of the sterilizer gas content in conjunction with lockout of the back vent to prevent exhausting high concentrations through the back vent. Direct analysis and the air-flow rate of the back vent and vacuum pump provide real-time information that can be used to limit EtO flow to the OECD below design limits. Selection of EtO process monitors should ensure that the safety, accuracy, reliability, calibration, and response time of the instrument are suitable for indicating whether EtO concentrations are below 25% of the EtO LEL before venting sterilizer gas to oxidizing emission control devices, in accordance with NFPA 560 chapters 8.2.1 and 11.5.3 (2002 edition).
   Selection, engineering, installation, testing, turnover, and maintenance and repair of process monitoring instrumentation should be done by a person who is qualified in chemical engineering, process safety, and/or fire prevention, to ensure that monitors are properly integrated into EtO process safety control systems under normal or abnormal conditions, emergencies, and maintenance operations.

E. Use redundant control valves (double-block, with leak check) on the EtO line.
   Use redundant control valves on the EtO line to prevent overfeeding if one valve fails or develops a leak.

F. Install valve position sensors on critical valves.
   Valve position sensors provide continuous feedback of a valve's open or closed status. Consider the types of position indicators installed and whether they can be used as a mechanical, electrical, or software interlock with the OECD.

G. Install a flow-limiting device on the vacuum pump inlet (controls or orifice).
   Install software or mechanical flow-limiting devices on vacuum pump inlets to prevent overfeeding of the OECDs.

H. In an emergency, disconnect the back vents and bypass the OECD (if legally allowed).
   In an emergency, removal of the back vents from the OECD can eliminate this stream as a source of overfeeding. However, this measure may be illegal because of the environmental impact.

I. Use redundancies or other safeguards for all critical valves.
   Redundant valves, sensors, or systems prevent overfeeding if one valve fails or develops a leak.

J. Vent confined spaces to the outside atmosphere after a power loss.
   Since high-EtO concentrations can accumulate in a confined space after a power loss, vent the confined space to the outside atmosphere to prevent buildup of EtO concentrations and overfeeding of the OECD.

K. Do not purge EtO lines to an OECD.
   Avoid purging EtO drums or venting EtO storage systems to an OECD, since an incorrect valve lineup or a serious leak in the storage area is likely to lead to overfeeding. Do not install a vent in the gas storage or charging area that feeds the OECD. Instead, consider using spring-closed valves.

L. Assure proper controls of other equipment.
   Systematically evaluate the integration of the OECD into the facility under all operating conditions during a process hazard analysis. The OECD relies on the correct operation of other sterilization equipment that may fail periodically. Failure of any single piece of equipment should not result in the unsafe operation of the OECD.

M. Provide limited access to override controls.
   Avoid overriding or bypassing safeguards or interlocks. Overrides of safety interlocks should not be allowed without proper review of their consequences by qualified personnel.

N. Provide an abort cycle (with diluent) in the sterilizer control system.
   If the sterilization cycle is aborted after EtO gas has been injected into the chamber, the sterilizer controller should automatically run an abort cycle. The abort cycle typically consists of evacuations and diluent washes to bring the gas content of the chamber below the lower flammability limit.

O. Fully train all operations, maintenance, and engineering personnel on the dangers of EtO-rich evacuations to an OECD.

Proper safety training is essential for all workers involved in operating the sterilization equipment.

P. Follow a cycle approval process for all test cycles.

When testing is performed using sterilization equipment or the OECD, an administrative approval process is recommended to ensure safe operation. During testing, the design limits of systems are often approached and safeguards are bypassed.

Q. Perform regular preventive maintenance.

A sound preventive maintenance program reduces the number of failures of critical equipment and therefore reduces the risk associated with operating the sterilization equipment.

R. Eliminate back vents through appropriate equipment and cycle design.

Through appropriate equipment and cycle design, back vents may be eliminated as an input stream to the OECD. Worker safety issues should be fully assessed when this preventive measure is implemented to ensure a safe working environment.

S. Obtain management and administrative approvals.

Proper management and administrative approvals are also needed before any changes are made to the process or safety interlocks. This approval process needs to include proper review of the consequences associated with any changes.

T. Use damage control devices.

Incorporate safety engineering devices such as flame or detonation arresters and explosion vents to minimize equipment and facility damage. Install the flame arresters or detonation arresters and check the valves in the EtO supply lines. Also, install flame arresters and check valves in the OECD feed lines from the vacuum pumps to eliminate flame propagation back into and throughout the system.

APPENDIX D: SAFETY CONSIDERATIONS FOR THE INTEGRATION OF OECDs

The EOSA Safety Committee has identified the safety concerns and good engineering design for the catalytic and thermal emission control devices listed in this appendix. Most of the recent explosion incidents in the EtO sterilization industry are associated with the use of OECDs, and nearly all are associated with opening a back vent. The following section provides information to consider in the design and integration of an OECD with a sterilizer. This section does not replace a typical process hazard analysis that should be conducted on the entire sterilization process before installing an OECD. Nor should this section replace the normal good engineering guidelines that should be used in the design of the equipment. The purpose of this section is to provide each facility with ideas for the process design and operation.

Good Engineering Design

Good engineering practice requires that the designer use proper engineering guidelines and codes in the design and operation of the sterilizer and associated equipment (including the OECD equipment). This includes adherence to proper electrical and mechanical codes throughout the sterilization system.

Furthermore, the designer needs to ensure that the equipment can safely accommodate maximum operating conditions (including EtO feed rates, temperature, pressure, etc.). Any startup, shutdown, or abnormal operating condition must be reviewed before the system is installed.

The designer should look at EtO inventories at every step of the process and determine the minimum and maximum rates (including EtO rate), minimum and maximum temperatures, minimum and maximum pressures, and other operating conditions. Good engineering practice should also include the review of all failure modes (such as a sticking EtO feed valve or smart valve failure) to see if the equipment selected can safely handle the resulting flow conditions.

If more than one sterilizer is used, this review must include all possibilities of “simultaneous” sources to ensure that the entire system is within the design limits. For safety concerns, the designer should look at atmospheric venting for emergency conditions (such as vessel over pressure). Good engineering practice should include redundant instrumentation of critical operating parameters (such as flow rates, EtO weights, etc.).

In addition, position indicator sensors should be included on any valves that are critical to the process and safe operation of the system. The control algorithm should include checking the alarm and sensor operation and its integrity during both normal and abnormal operating conditions.

Other good engineering practices include installing manual valves for equipment isolation. A dual path may be desirable because it allows connection of a backup pump or sensor until a broken item can be repaired. Safety must be considered in the design of engineering equipment.

Integration of Emission Control Device with the Sterilization Process

If an OECD is used, it needs to be properly integrated with the sterilization process, possibly with a scrubber system. The design and operation of both the OECD and the sterilization system must be considered, as the two processes are connected. All operating conditions of the sterilization process, including those during startup, shutdown, and test phases, must be analyzed for potential failure points. Abnormal process conditions pose the most serious safety challenges.

Only after the OECD limitations have been established can the entire operating and control system be devised and reviewed to ensure that these limitations cannot be exceeded under any circumstance. EtO concentrations in the explosive range must never be allowed to enter the device that can create a temperature rise sufficient to ignite the gas stream.

The design of the emission control system must take into account the potential for release of EtO from all EtO sources in the facility. The design may vary substantially, depending on the limitations of the control device selected. Since the gas that is initially discharged from the sterilizer by the vacuum pump is always concentrated, dilution is necessary.

Safety Concerns Associated with Catalytic or Thermal OECDs

Most emission control devices have two limitations: (1) the maximum volumetric flow capacity (commonly expressed in cubic feet per minute), and (2) the maximum quantity of EtO it can process (commonly expressed in pounds per minute). However, if the system has a variable flow capacity, it will most likely have a variable EtO capacity, which will be expressed as a concentration limit — commonly, ppm.

The most immediate safety concern associated with catalytic or thermal OECDs is to prevent overfeeding the system. The most severe result of overfeeding occurs when a quantity of EtO is released that is greater than the lower flammability limit. In this case, the exhaust stream can be ignited by the burner flame (if the OECD has a burner) or by an increase in the catalyst temperature. This would cause an explosion throughout the OECD, the exhaust ducting, and connected sterilizers.

The following four conditions might overfeed an OECD and cause an explosion. Included are references to preventive measures from Appendix C.

1. Overfeeding the OECD from back vents containing high concentrations of EtO

   Nearly all of the known explosions associated with OECDs occurred when a sterilizer back vent was opened while a high concentration of EtO was in a sterilizer. This condition generally involves a worker's (a) opening a sterilizer door that triggers back vent operation, (b) using a manual switch to trigger back vent operation, or (c) triggering back vent operation through a sterilizer controller. The high flow rate of the back vent exhausts could send EtO at a rate that exceeds the safe design limitation of the OECD. An explosion could result.

   Each sterilization facility should be examined to determine every condition in which a back vent could be opened while a sterilizer contains an EtO-rich mixture. Appropriate measures should then be taken to prevent opening of the back vent when these conditions exist. Employee error has been a significant cause of overfeeding events. Errors have resulted from allowable procedure changes, test conditions, use of improper procedures, and inadequate process control systems.

   Since EtO operators can make mistakes, the process hazard analysis must address possible human errors and identify safeguards to protect against and prevent them. Bypassing interlocks should never be allowed without specific permission based on extensive evaluation and knowledge of the possible consequences by designated, qualified personnel.

   Sterilization requires an EtO-rich environment during part of the overall cycle. The EtO-rich gas is removed from the sterilizer by the vacuum pump. A normal cycle includes post-vacuum flushing or purges that successively dilute the EtO concentration in the sterilizer before opening the back vent. In all cases, the normal number of post-vacuum purges should be completed before initiating the back vent. If operations do not go as planned, back vents may be activated during the following unplanned situations:

- Sterilizer back vent turned on with EtO-rich gas present — This situation may be caused by the following:
  - o Bypassing safety interlocks — Even in the best engineered systems, bypassing of safety interlocks by operators or maintenance personnel can result in overfeeding an OECD through the back vent. Aborting cycles after EtO gas is added without adequate diluent washes is an example of improper bypassing of safety interlocks (review preventive measures A, B, C, D, H, and N in Appendix C).
  - o EtO valve leak — This condition involves a leak of EtO into the sterilizer anytime before a back vent operation. While a pressure rise would generally be observed during the sterilization control portion of a cycle, a person could misdiagnose the cause of the pressure rise. When a cycle is not running, a leak could also fill a sterilizer before a door is opened, triggering back vent operation (review preventive measures A, B, C, D, E, F, H, and Q in Appendix C).
  - o Product degasses too long in sterilizer after cycle completion — Significant degassing can occur as a load sits in a non-vented sterilizer, resulting in an EtO-rich environment (review preventive measures C, D, H, and J in Appendix C).
  - o Computer system/controller failure — Computer systems or controllers that directly interface with the sterilization process or OECD control can fail from power bumps, age, software bugs, etc. Since these systems are critical to interlock mechanical equipment properly, their failure can result in an EtO-rich environment in a sterilizer (review preventive measures A, B, D, H, J, and Q in Appendix C).
  - o Instrumentation failure — The sterilizer controller relies on signals from sensors and transmitters to control and monitor the cycle, and these can fail. In addition, lower flammability limit sensors are considered unreliable for use in EtO environments and should not be relied on for quantitative decisions in controllers associated with OECDs (review preventive measures H and Q in Appendix C).
- Inadequate washing before opening the door — Cycle design that does not provide for a sufficient number of

diluent washes after EtO exposure generally results in an EtO-rich environment before back vent operation (review preventive measures D and H in Appendix C).

- Incorrect cycle used for product -- Because of variable absorption and desorption rates by different products, a cycle that does not finish with an EtO-rich environment for one product may finish with an EtO-rich environment for other products (review preventive measures D, H, O, and P in Appendix C).
- Slow response time — Some lower flammability limit and flow sensors could have slow response times that would not properly identify an EtO-rich stream going to the OECD (review preventive measures D, H, I, and R in Appendix C).
- Test cycles — Test cycles often explore process capability limits, and unexpected EtO-rich environments can result (review preventives measures A, B, C, D, H, O, and P in Appendix C).

2. Overfeeding from vacuum pumps

Unless an OECD is sized to accept the peak flow of every system exhausting to it, a control algorithm will be necessary to sequence (queue) the number of vacuum pumps evacuating to the OECD. The algorithm may have to monitor what point in the cycle every sterilizer is operating. The control can be very complex and must be thoroughly evaluated. OECD manufacturers rely on the facility personnel to control the maximum amount of EtO flow to OECD. The following are ways design limits can be exceeded:

- Too many vacuum pumps operating (design and control issue) — An expanding facility can exceed design limits by (1) adding sterilizers, aeration rooms, or an EtO-rich cycle to a sterilizer not previously considered in the design of the queue controller, or (2) incorrectly computing EtO concentrations being evacuated (review preventive measures G, H, I, L, and O in Appendix C).
- Misdirecting discharges — Directing an EtO-rich exhaust stream into a duct system faster than the duct can move it to the OECD can deliver EtO-rich gas to another idled sterilizer or aeration room. This situation creates a “temporary inventory” that is later sent unknowingly to the OECD (review preventive measures D, G, H, I, J, and L in Appendix C).
- Failure to interlock or control incoming flows — Proper queue control of all flows must be considered to prevent overfeeding the OECD. Inaccuracies or failures in the queue controller could allow evacuations at a flow rate exceeding the limits of the OECD. Although OECD manufacturers generally have safety cut-off systems that react to some overfeeding conditions, the reaction is generally too late to prevent an explosion if the exhaust stream is above the lower flammability limit (review preventive measures G and I in Appendix C).
- Failure or malfunction of the EtO feed valves — Failure of an EtO feed valve can result in an unexpected EtO-rich environment in a sterilizer. When the vacuum pump is activated, it delivers more EtO than planned (review preventive measures E, F, G, I, and Q in Appendix C).
- Bypassing safety interlocks — Even on the best-engineered systems, bypassing safety interlocks by operations, maintenance, or engineering personnel can result in a back overfeeding of the OECD by the back vent. Aborting cycles after EtO gassing without adequate diluent washes is an example of improper bypassing of safety interlocks (review preventive measures A, B, C, D, H, M, N, and O in Appendix C).

3. Overfeeding from lack of adequate dilution air

- Loss of the aeration exhaust or dilution source — Some OECD installations rely on the aeration room exhaust to dilute the high concentrations from EtO-rich sources to a safe concentration (review preventive measures I and Q in Appendix C).
- Loss of make-up dilution — OECDs generally have one or more fans, various valves, one or more filters, a diffuser, and a catalyst bed. The failure or plugging of any of these items decreases the flow of air. Discharging an otherwise acceptable EtO-rich stream may cause overfeeding because of insufficient dilution (review preventive measures I and Q in Appendix C).

4. Overfeeding from other sources

- Spills or drum leaks near vents to OECD — Spills or drum leaks near any vent flowing to an OECD can result in an unplanned EtO-rich flow delivered to an OECD. Spills most generally occur from a leaky valve or damage to an EtO line (review preventive measures E, K, O, and Q in Appendix C).
- Lack of interlock between EtO valve and sterilizer — Most chamber installations do not have interlocks preventing the opening of a sterilizer door when the EtO valve is open. If the back vent is interlocked to trigger when the chamber door is opened, an EtO-rich mixture can be delivered to an oxidizer (review preventive measures A, B, D, H, O, and M in Appendix C).
- Failure or malfunction of the air in-bleed valve — Failure of the air in-bleed valve can cause a nonflammable cycle to change to an EtO-rich flammable cycle that might exceed an OECD’s safe operating conditions (review preventive measures D, F, and Q in Appendix C).
- Sticking valves that result in misdirected flow — A multiport control valve designed to send exhaust either to an OECD or to the atmosphere can fail, allowing the operator to deliver EtO-rich gas to the OECD rather than to the atmosphere (review preventive measures F and Q in Appendix C).
- Purging EtO cylinders with EtO delivery valves in wrong position — If an EtO delivery system is piped to allow purging of EtO cylinders to an OECD, an operator could empty an entire cylinder into the OECD line when valves are left in the wrong position (review preventive measures G, K, L, and O in Appendix C).
- Improper operation of upstream scrubber — If an OECD relies on an upstream scrubber to reduce EtO

concentrations, malfunction of the upstream system can overfeed the OECD. A scrubber can be considered a safeguard ONLY when operating properly (review preventive measures I, L, and Q in Appendix C).

- Sterilizer control systems inadequate — Older sterilizer controllers may not support the safe operation of an OECD. Systems requiring periodic manual intervention are of particular concern (review preventive measure L in Appendix C).
- Lack of cabinet locks — Many older sterilizer control systems allow easy access to the manual sterilizer switches. If manual intervention is allowed, there is high danger that a person will trigger a wrong switch and send an EtO-rich flow to an OECD (review preventive measures G, L, M, and O in Appendix C).

APPENDIX E: PROCESS HAZARD ANALYSIS

Background and Regulatory Requirements

A process hazard analysis is an effective tool that provides a systematic analysis of hazards associated with the sterilization process and the integration of environmental controls with this process. The chemical industry has been using process hazard analyses successfully for the past several years to identify and correct hazards associated with their processes. The sterilization industry should also use a process hazard analysis as a risk assessment tool to identify and correct hazards associated with EtO and their equipment.

Recent regulations from OSHA and EPA may require the industry to conduct such process hazard analyses on a regular basis. In 1992, OSHA promulgated the process safety management regulation that requires companies to establish a process safety management system for any process that contains more than 5,000 lb of EtO.

The process safety management system includes several key elements (e.g., procedures, training, maintenance, and management of change) and requires that process hazard analyses be conducted and updated or revalidated on a regular basis. All process hazard analyses were to have been completed by May 1997; several sterilization facilities are subject to these requirements.

In June 1996, EPA promulgated its risk management program regulation, which requires any company that handles more than 10,000 lb of EtO to implement a risk management program and prepare a risk management plan. The risk management program builds on the OSHA process safety management standard (compliance with the OSHA process safety management standard will basically meet EPA requirements as long as offsite consequences are included). The risk management program also requires process hazard analyses or hazard reviews as part of an accident prevention program.

Information about the program is documented in a risk management plan that must be submitted to EPA in June 1999. Finally, the Clean Air Act Amendments of 1990 include a general duty clause that states that “any facility handling any extremely hazardous substance must identify hazards using appropriate hazard assessment techniques, design and maintain a safe facility taking such steps as necessary to prevent accidental releases and minimize the consequences of accidental releases that do occur.”

Several different process hazard analysis methodologies are available to help assess the hazards associated with the sterilization process. The above regulations do not specify the process hazard analysis methodology to use, but they do have process hazard analysis requirements.

These process hazard analysis requirements stipulate that a multifunctional team familiar with the process must be used for a process hazard analysis. Also, the process hazard analysis leader must be knowledgeable in the particular methodology being used for the analysis. They also require that workers be involved and made aware of this study and its recommendations.

The company must select the proper process hazard analysis methodology for the sterilization process and their analysis goals. The methodology selected should allow the process hazard analysis team to adequately review the failure modes of all equipment and instrumentation, potential operator errors, adequacy of the control system and interlocks, previous industry incidents, and any other process hazard.

For an overall review of the hazards associated with the entire sterilization process, a gross hazard analysis (including what-if) or hazardous operability study (HAZOP) is probably the most appropriate methodology type. Other methodology types may be used for other analysis purposes (such as accident investigation or quantitative reviews).

General guidance on process hazard analysis and generic process design and control methods is available in publications from the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE)

For more information, see Safe Design and Operation of Process Vents and Emission Control Systems, Center for Chemical Process Safety, AIChE (John Wiley & Sons, Hoboken, N.J., 2006).

CHEMICAL SAFETY ALERT: Identifying Chemical Reactivity Hazards: Preliminary Screening Method

HOME

EPA is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and consider whether additional action is needed to address the hazards.

Problem

Lack of awareness of the reactive chemical hazards in a facility results in a higher risk of hazardous uncontrolled chemical reactions. The current industry consensus defines chemical reactivity hazard as a situation where an uncontrolled chemical reaction could result directly or indirectly in serious harm to people, property, or the environment. Many materials used in industrial facilities can pose chemical reactivity hazards. Reactivity hazards may not be as easy to identify as other hazards such as toxicity or corrosivity. Your facility is at a higher risk of having an uncontrolled release if you don't identify all the existing chemical reactivity hazards.

The purpose of this alert is to introduce small-and medium-sized facilities to a simple method developed by the Center for Chemical Process Safety(CCPS), Essential Practices for Managing Chemical Reactivity Hazards, to screen facilities for chemical reactivity hazards. The CCPS preliminary screening method is a tool to help you identify where chemical reactivity hazards are likely to occur in your facility and may be applicable to a wide range of activities including warehousing, repackaging, blending, mixing, and processing.

Understanding the Hazard

The first step in managing chemical reactivity hazards is identifying those facility operations and chemicals that represent a potential chemical reactivity hazard.

The preliminary screening method is based on a series of twelve "yes-or-no" questions to help you determine if there are chemical reactivity hazards in your facility. These questions maybe answered by one person, but you may be able to do a more thorough screening by setting up a team composed of people with diverse expertise. Whenever possible, include people representing technical, production, health and safety, and the purchasing perspectives. In any case, if you or your team are not certain about the right answer to any question, you should seek expert advice.

If you answer questions 1 to 4 with a definite NO, then you are not likely to have chemical reactivity hazards at your facility.

Q1. Is intentional chemistry performed at your facility?

Intentional chemistry means processing of substances such that an intended chemical reaction takes place.
—Yes? Go to Question 5 #
—No? Answer Question 2

Q2. Is there any mixing or combining of different substances?

Consider wide range of activities, from large scale formulations to individual procedures when answering.
—Yes? Go to Question 6
—No? Answer Question 3

Q3. Does any other physical processing of substances occur at your facility?

Physical processing means any modification that results in a product that is physically, but not chemically, different from the original material.
—Yes? Go to Question 6
— No? Answer Question 4

Q4. Are there any hazardous substances stored or handled at your facility?

Hazardous substances include materials for which MSDSs are required as well as chemical intermediates and by-products.
—Yes? Go to Question 7
—No? You are not likely to have any chemical reactivity hazards at your facility!

With the exception of question 5, a positive answer to any of the following questions means chemical reactivity hazards do exist at your facility and you address them.

Q5. Is combustion with air the only chemistry intended at your facility?

Burning of ordinary flammable and combustible material is not considered a chemical reactivity hazard.
—Yes? Go back to Question 2
— No? Chemical Reactivity is expected to occur

Q6. Is any heat generated during the mixing or physical processing of substances?

Heat can be generated by heat of solution, heat of absorption, mechanical energy, or other physical heat effects.

—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

If your facility stores, handles, repackages, produces or uses any hazardous materials, you should give special consideration to the following set of questions.

Q7. Is any substance identified as spontaneously combustible?

"Spontaneously combustible" refers to substances that will readily react with the oxygen in the atmosphere, igniting and burning even without an ignition source.
—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

Q8. Is any substance identified as peroxide forming?

"Peroxide forming" refers to substances that will react with the oxygen in the atmosphere to form unstable peroxides, which might decompose and explode if concentrated.
—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

Q9. Is any substance identified as water reactive?

"Water reactive" refers to substances that will chemically react with water, particularly at normal ambient conditions.
—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

Q10. Is any substance identified as an oxidizer?

'Oxidizers' are materials that readily react to promote or initiate combustion of combustible material.
—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

Q11. Is any substance identified as self-reactive?

"Self-reactive" refers to substances that self react (e.g., polymerize, decompose, or rearrange), often with accelerated or explosive rapidity.
—Yes? Address Reactive Chemical Hazard!
— No? Go to next Question

Q12. Can incompatible materials coming into contact with each other cause undesired consequences?

'Incompatible materials' are materials that when accidentally mixed or brought into contact with each other will result in an uncontrolled chemical reaction.
—Yes? Address Reactive Chemical Hazard!
— No? Chemical reactivity hazards are unlikely to be present. You completed the Preliminary screening method.

Controlling the Hazard

Chemical reactivity hazards can be controlled by incorporating control techniques into the facility's hazard management system. If you identified chemical reactivity hazards in your facility, a hazard management system can properly address them. Most likely you already have a hazard management system in place to address other hazards and can incorporate reactive chemical hazards into the existing programs. Regulatory process safety and risk management systems such as OSHA PSM, and EPA's RMP incorporate elements that are applicable to the management of reactive chemicals and can be used as a basis. Note that EPA's Chemical Accident Prevention regulations at 40 CFR part 68 do not cover reactive chemicals as a group. Those regulations apply only to facilities having more than a threshold quantity of a chemical listed at 68.130 of the regulations. However, EPA believes that facilities have a general duty to address significant reactive chemical hazards under the general duty clause of section 112(r)(1) of the CAA.

Information Resources

Partnership To Provide Information

As mentioned above, this alert is intended to help facilities identify chemical reactivity hazards and become familiar with the preliminary screening method developed by CCPS. You can find a detailed explanation of this method and related management practices in CCPS' book Essential Practices for Managing Chemical Reactivity Hazards.

In order to make this valuable tool accessible to all facilities, EPA, OSHA, CCPS, the American Chemistry Council (ACC), the Synthetic Organic Chemical Manufacturers Association (SOCMA) and Knovel Corporation have contributed resources to make CCPS' Essential Practices for Managing Chemical Reactivity Hazards available for free downloading at the following web page: http://knovel.com.

Chemical Safety Resources

For additional information on CCPS, please visit their website at: http://www.aiche.org/ccps/

The U.S. Chemical Safetyand Hazard Investigation Board (CSB) is an independent federal agency whose mission is to prevent industrial chemical accidents and save lives. For more information on the CSB, visit their website at: http://www.chemsafety.gov/

For additional information on OSHA, visit their website at: http://www.osha.gov

CHEMICAL SAFETY ALERT: Hazards of Delayed Coker Unit (DCU) Operations

HOME

The Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) are jointly issuing this Chemical Safety Alert/Safety and Health Information Bulletin (CSA/SHIB) as part of ongoing efforts to protect human health and the environment by preventing chemical accidents. We are striving to better understand the causes and contributing factors associated with chemical accidents, to prevent their recurrence, and to provide information about occupational hazards and noteworthy, innovative, or specialized procedures, practices, and research that relate to occupational safety and health and environmental protection.

Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons into safe operations are also required. EPA and OSHA jointly publish this CSA/SHIB to increase awareness of possible hazards. This joint document supplements active industry efforts to exchange fire and safety technology and to increase awareness of environmental and occupational hazards associated with DCU operations.

It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA or OSHA regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, OSHA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon the circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

Problem

The batch portion of DCU operations (drum switching and coke cutting) creates unique hazards, resulting in relatively frequent and serious accidents.

The increasingly limited supply of higher quality crude oils has resulted in greater reliance on more intensive refining techniques. Current crude oils tend to have more long chain molecules, known as “heavy ends” or “bottom of the barrel” than the lighter crude oils that were more readily available in the past. These heavy ends can be extracted and sold as a relatively low value industrial fuel or as a feedstock for asphalt-based products, such as roofing tile, or they may be further processed to yield higher value products. One of the most popular processes for upgrading heavy ends is the DCU, a severe form of thermal cracking requiring high temperatures for an extended period of time.

This process yields higher value liquid products and creates a solid carbonaceous residue called “coke.” As the supply of lighter crude oils has diminished, refiners have relied increasingly on DCUs.

Unlike other petroleum refinery operations, the DCU is a semi-batch operation, involving both batch and continuous stages. The batch stage of the operation (drum switching and coke cutting) presents unique hazards and is responsible for most of the serious accidents attributed to DCUs. The continuous stage (drum charge, heating, and fractionation) is generally similar to other refinery operations and is not further discussed in this document. About 53 DCUs were in operation in the United States in 2003, in about one third of the refineries.

In recent years, DCU operations have resulted in a number of serious accidents despite efforts among many refiners to share information regarding best practices for DCU safety and reliability. EPA and OSHA believe that addressing the hazards of DCU operations is necessary given the increasing importance of DCUs in meeting energy demands, the array of hazards associated with DCU operations, and the frequency and severity of serious incidents involving DCUs.

Understanding the Hazards

Safe DCU operations require an understanding of the situations and conditions that are most prone to frequent or serious accidents.

Process Description

Each DCU module contains a fired heater, two (in some cases three) coking drums, and a fractionation tower. This document focuses on the coke drums, which are large cylindrical metal vessels that can be up to 120 feet tall and 29 feet in diameter.

In delayed coking, the feed material is typically the residuum from vacuum distillation towers and frequently includes other heavy oils. The feed is heated by a fired heater (furnace) as it is sent to one of the coke drums. The feed arrives at the coke drum with a temperature ranging from 870 to 910°F. Typical drum overhead pressure ranges from 15 to 35 psig. Under these conditions, cracking proceeds and lighter fractions produced are sent to a fractionation tower where they are separated into gas, gasoline, and other higher value liquid products. A solid residuum of coke is also produced and remains within the drum.

After the coke has reached a predetermined level within the “on oil” drum, the feed is diverted to the second coke drum. This use of multiple coke drums enables the refinery to operate the fired heater and fractionation tower continuously.

Once the feed has been diverted, the original drum is isolated from the process flow and is referred to as the "off oil" drum. Steam is introduced to strip out any remaining oil, and the drum is cooled (quenched) with water, drained, and opened (unheaded) in preparation for decoking.

Decoking involves using high pressure water jets from a rotating cutter to fracture the coke bed and allow it to fall into the receiving area below. Once it is decoked, the "off oil" drum is closed (re-headed), purged of air, leak tested, warmed-up, and placed on stand-by, ready to repeat the cycle. Drum switching frequency ranges from 10 to 24 hours.

Once removed from the coke drums, the coke is transported away from the receiving area. From here, the coke is either exported from the refinery or crushed, washed, and stored prior to export.

The following specific operations and more general situations and conditions contribute most significantly to the hazards associated with DCU operations:

Specific operation hazards

- Coke drum switching
- Coke drum head removal
- Coke cutting (hydroblasting operation)

Emergency and general operational hazards

- Coke transfer, processing, and storage
- Emergency evacuation
- Toxic exposures, dust irritants, and burn trauma

The hazards associated with these specific operations and DCU operations, in general, are explained below to share lessons learned and increase awareness of the situations and conditions that are most prone to serious accidents.

Following this section, the joint CSA/SHIB describes actions that can be taken to help minimize the risks associated with these situations and conditions.

Specific Operation Hazards

Coke Drum Switching

Most DCU operations consist of several DCU modules, each typically alternating between two coke drums in the coking/ decoking sequence. Some DCU modules include a third drum in this sequence. Each drum includes a set of valving, and each module includes a separate set of valving.

Differences in valving among drums and among modules may be difficult to distinguish and can lead to unintended drum inlet or outlet stream routing.

Similarly, valve control stations, for remotely activated valves, may not always clearly identify the operating status of different drums and modules.

Activating the wrong valve because of mistakes in identifying the operational status of different drums and modules has led to serious incidents.

Coke Drum Head Removal

Conditions within the drum, during and after charging, can be unpredictable. Under abnormal conditions, workers can be exposed to the release of hot water, steam and coke, toxic fumes, and physical hazards during removal of the top and bottom drum heads. The most frequent and/or severe hazards associated with this operation are described below:

- Geysers/eruptions - Under abnormal situations, such as feed interruption or anomalous short-circuiting during steaming or quenching, hot spots can persist in the drum. Steam, followed by water, introduced to the coke drum in preparation for head removal can follow established channels rather than permeate throughout the coke mass. Because coke is an excellent insulator, this can leave isolated hot areas within the coke. Although infrequent, if the coke within the drum is improperly drained and the coke bed shifts or partially collapses, residual water can contact the isolated pockets of hot coke, resulting in a geyser of steam, hot water, coke particles, and hydrocarbon from either or both drum openings after the heads have been removed.
- Hot tar ball ejection -Feed interruption and steam or quenching water short-circuiting can also cause "hot tar balls," a mass of hot (over 800°F) tar-like material, to form in the drum. Under certain circumstances, these tar balls can be rapidly ejected from the bottom head opening.
- Undrained water release - Undrained hot water can be released during bottom head removal, creating a scalding hazard.
- Shot coke avalanche - Sometimes, the coke forms into a multitude of individual, various sized, spherical shaped chunks known as "shot coke," rather than a single large mass. In this situation, the drum contents are flowable and may dump from the drum when the bottom head is removed, creating an avalanche of shot coke.
- Platform removal/falling hazard - Some DCUs require the removal of platform sections to accommodate unheading the bottom of the drum. This can introduce a falling hazard.

Coke Cutting (Hydroblasting Operation)

Coke-cutting or -hydroblasting involves lowering from an overhead gantry a rotating cutter that uses high pressure (2000 to 5000 psig) water jets. The cutter is first set to drill a bore hole through the coke bed. It is then reset to cut the coke away from the drum interior walls. Workers around the gantry and top head can be exposed to serious physical hazards, and serious incidents have occurred in connection with hydroblasting operations. Some of the most frequent and/or severe hazards are described below:

- If the system is not shut off before the cutting nozzle is raised out of the top drum opening, a high pressure

water jet can be exposed and seriously injure, even dismember a nearby worker.
- Fugitive mists and vapors from the cutting and the quench water can contain contaminants that pose a health hazard (see section on Toxic Exposures, Dust Irritants and Burn Trauma, below).
- The water hose can burst while under high pressure, resulting in whipping action that can seriously injure nearby workers.
- The wire rope supporting the drill stem and water hose can fail (part), allowing the drill stem, water hose, and wire rope to fall onto work areas.
- Gantry damage can occur, exposing workers to falling structural members and equipment.

Emergency and General Operational Hazards

Coke Transfer, Processing, and Storage

The following coke conveyance, processing, and storage operations have presented safety and health hazards for DCU workers:
- The repositioning of rail cars by small locomotives or cable tuggers to receive coke being cut from a drum can create physical hazards for workers in the rail car movement area.
- Mechanical conveyors and coke crushers may contain exposed moving parts that can cause fracture or crush type injuries at pinch points.
- Fires are common in coke piles and rail cars. Large chunks of coke can contain pockets of unquenched material at temperatures well above the ignition point. When fractured and exposed to air, this material can ignite. Fires have also been attributed, although less frequently, to reactions that lead to spontaneous combustion.
- Combustion products and/or oxygen depletion resulting from spontaneous fires can create hazardous conditions for workers in confined spaces.
- Wet coke in an enclosed area has been reported to have absorbed oxygen from the surrounding air under certain circumstances. This can make the area oxygen deficient and cause asphyxiation.

Emergency Evacuation

The delayed coking process is very labor intensive. Each batch process cycle requires 25 or more manual operations (valve, winch operation, drum heading, etc.), and many DCUs operate with three or more sets of drums. Tasks are performed at several levels on the coke drum structure. The upper working platform (frequently called the “cutting deck”) is generally well over 120 feet above ground. During an emergency, evacuation from the structure can be difficult.

In addition, moisture escaping from drum openings during cold weather can produce fog. This can obscure vision and make walkways, and hand rails wet and slippery, creating additional difficulties during emergency evacuation.

Toxic Exposures, Dust Irritants, and Burn Trauma

DCU workers can be exposed to coke dust and toxic substances in gases and process water around DCU operations. Workers can also be exposed to physical stress and other hazardous conditions. The following exposures to toxic substances, irritants, and hazardous conditions have been associated with DCU operations, in general:
- Hot water, steam, and liquid hydrocarbon (black oil) can escape from a coke drum and cause serious burn trauma. Contact with black oil can cause second or third degree burns. In addition, liquid hydrocarbon escaped from a coke drum can be well above its ignition temperature, presenting a fire hazard.
- Heat stress can be a health hazard during warm weather, particularly for those required to wear protective clothing while performing tasks on the coke drum structure.
- Hazardous gases associated with coking operations, such as hydrogen sulfide, carbon monoxide, and trace amounts of polynuclear aromatics (PNAs), can be emitted from the coke through an opened drum or during processing operations.
- If allowed to accumulate and become airborne, dust around a DCU may exceed acceptable exposure limits and become a hazard.

Controlling the Hazards

Evaluating hazardous conditions, modifying operations to control hazards, actively maintaining an effective emergency response program, and familiarizing workers about risks and emergency procedures will help reduce the frequency and severity of serious incidents associated with DCU operations.

Specific Operation Hazards

Coke Drum Switching

No one system has proven effective in eliminating all incidents associated with incorrect valve activation due to mistaken coke drum or module identification; however, the following actions have been reported as beneficial:
- Conduct human factors analyses to identify, evaluate, and address potential operator actions that could compromise the safe operation of the coke drum system.
- Provide interlocks for automated or remotely activated valve switching systems.
- Provide interlocks for valves that are manually operated as part of the switching/decoking cycle to avoid unanticipated valve movement.
- Color code and clearly label valves and control points to guard against incorrect identification.

- Provide indicator lights at valve and valve control stations to help the operator determine which is the correct valve station for the intended operator action.
- Use the “buddy system” (employees working in pairs) to help verify accurate valve or switch identification.
- Conduct periodic and documented training focusing on the importance of activating the correct valve or switch and the consequence of incorrect activation.

Coke Drum Head Removal

It can be difficult to anticipate the presence of either a hot spot or a hot tar ball in the coke drum prior to drum head removal. In light of this possibility and the potential for serious incidents, it is prudent to:

- Be alert to any operating abnormalities or variations during charging, steaming, or quenching that may forewarn a hot spot or tar ball. Have a contingency plan to deal with such issues before proceeding with coke drum head removal and coke cutting.
- Always assume the possibility of a hot-spot induced geyser or the release of hot tar balls or undrained hot water, and incorporate protective operational measures in drum unheading operations. Further control the hazard by establishing restricted areas; minimizing the number of workers in restricted areas; minimizing the time spent by essential workers in restricted areas; and maintaining readiness for a rapid evacuation.
- Consider equipment upgrades to further control the hazards associated with geysers and release of hot tar balls and undrained hot water during drum head removal, such as installing protective shrouds and automating both top and bottom head removal operations to keep workers away from these unprotected areas.
- Consider emergency steam/cooling water sources in the event of loss of primary steam/cooling water supply or because of drum inlet flow path obstruction.
- Provide temporary guardrails to prevent employees from falling while platform plating is removed for bottom head removal.
- Consider installation of vapor ejectors to draw vapors away from the open top head area.

Coke Cutting (Hydroblasting Operation)

The following actions could help control hazards associated with coke cutting operations:

- Install an enclosed cutter’s shack for worker protection--preferably supplied with air from a remote source to maintain slight positive pressure.
- Ensure that personnel who must be on the coke drum structure when a drum is open wear prescribed personal protective equipment.
- Conduct training in recognition and prevention of worker heat stress.
- Make sure the interlocks will work to shut off and prevent restart of the cutting water pump any time that the cutting head is raised above a predetermined point within the coke drum. Consider installing redundant switches to provide an additional level of protection against extracting a cutting head that is under pressure.
- Verify the adequacy of the inspection and maintenance program for cutting water hoses, wire ropes, and hoists.
- Establish a gantry structure inspection and maintenance program. Periodically verify that gantry structures have not been weakened due to corrosive conditions, such as mist exiting from the top nozzle that could lead to gantry collapse.
- Install drill stem free fall arresters.

Emergency and General Operational Hazards

Coke Transfer, Processing, and Storage

The following actions could help control hazards associated with coke conveyance, processing, and storage operations:

- Establish and enforce restricted areas (e.g., areas where heavy equipment movement and possible lash path of a wire rope from failed equipment may occur) to prevent personnel entry and, ultimately, injury.
- Establish and periodically verify the operability of an alarm system that activates immediately before and during heavy equipment (rail car, bridge crane, or conveyor) movement.
- Verify conformance with a safe entry permit system to ensure that appropriate measures are taken prior to and during entry into any enclosed area or vessel where coke may be present.
- Establish personnel protective measures to protect against inhalation or personal contact with coke dust or potentially contaminated mists from water used for cutting, quench, or coke conveyance (see section on Toxic Exposures, Dust Irritants, and Burn Trauma, below).

Emergency Evacuation - Preparations and Procedures

Despite best efforts to prevent incidents, DCU operators should anticipate the need for emergency evacuation and other response measures, operate in a manner that will minimize the severity of an incident, and prepare for and implement emergency procedures to protect worker safety. The following specific actions are recommended:

- Review and address weaknesses associated with the location and suitability of emergency escape routes. Protected stairways, preferably detached from the coke drum structure, are the most effective conventional means of emergency escape route (egress) from tall structures, such as those serving the coke drums. Consider installing horizontal walkways to adjacent structures. Some refineries are exploring the use of commercially available escape chutes. Also, slip resistant walking surfaces will help prevent falling during an emergency evacuation.

- Establish or verify the operability of an evacuation signal (Scram Alarm) to expedite personnel clearing the structure in the event of an emergency. Alarm signal actuation (triggering) stations should be deployed at work areas and along the escape routes.
- Install water sprays to protect work stations and emergency escape routes. Include activation stations at work stations and along the escape route.
- Provide heat shields to protect work stations and escape routes. Ensure that the shield will not interfere with evacuation and will not entrap fugitive vapors.
- Conduct regular emergency exercises to test the plan as well as to ensure familiarity with emergency signals, evacuation routes, and procedures.

Toxic Exposures, Dust Irritants, and Burn Trauma

The following actions could help control exposures to toxic substances, irritants, physical stress, and hazardous conditions associated with DCU operations, in general:

- Configure coke drum inlets and outlets with doubleblock valve and steam seal isolation to reduce the likelihood of unanticipated leakage.
- Establish burn trauma response procedures, including procedures for interacting with emergency medical service providers and the burn trauma center that would be used in the event of a burn incident.
- Conduct burn trauma simulation exercises to ensure appropriate use of the emergency response procedures and the training level of relevant personnel.
- Evaluate health exposure potential and establish appropriate protective measures based on an industrial hygiene survey plan that anticipates variations in the range of DCU feed stocks and operating conditions.
- Shovel, sweep, vacuum, and provide proper ventilation to keep exposures to dust around a DCU to within acceptable limits.

Information Resources

Internet resources - The search entry, “Delayed Coker Unit,” yields many sources of information that are believed to be useful. However, neither EPA nor OSHA control this information and cannot guarantee the accuracy, relevance, timeliness or completeness of all facets of the information.

Further, the citation to these resources is not intended to endorse any views expressed, or services offered by the author of the reference or the organization operating the service identified by the reference. The following are examples of informative additional reading.

- http://www.coking.com - focuses on coking best practices, safety, reliability, and communications within the DCU industry.
- http://www.fireworld.com/magazine/coker. html – describes a May 1999 coking unit fire and offers recommendations on fire protection.

CHEMICAL SAFETY ALERT: Chemical Accident Prevention: Site Security

HOME

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required.

EPA publishes Alerts to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders, and others review this information and take appropriate steps to minimize risk. This document does not substitute for EPA's regulations, nor is it a regulation itself. It cannot and does not impose legally binding requirements on EPA, states, or the regulated community, and the measures it describes may not apply to a particular situation based upon circumstances. This guidance does not represent final agency action and may change in the future, as appropriate.

PROBLEM

Facilities that handle chemicals are actively engaged in managing risks to ensure the safety of their workers and the community. Most of their efforts focus on ensuring that the facility is designed and operated safely on a day-to-day basis, using well-designed equipment, preventive maintenance, up-to-date operating procedures, and well-trained staff.

Because of today's increased concern about terrorism and sabotage, companies are also paying increased attention to the physical security of facility sites, chemical storage areas, and chemical processes. All companies, big and small, should have some measure of site security in place to minimize crime and to protect company assets. This is especially true for facilities that handle extremely hazardous substances.

Under section 112(r) of the Clean Air Act (CAA), EPA developed Risk Management Program (RMP) regulations that require facilities to examine their chemical accident risk and develop a plan to address it. The increased concern for the physical security of facilities that handle extremely hazardous substances is also reflected in recent government actions.

Highlighting site security, the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act contains a major provision that requires the Department of Justice to prepare reports to be submitted to Congress describing the effectiveness of RMP regulations in reducing the risk of criminally caused releases, the vulnerability of facilities to criminal and terrorist activity, and the security of transportation of listed toxic and flammable substances.

This Alert is intended as a public service. It highlights security areas that companies may want to review to ensure that appropriate measures are being implemented. More importantly, it provides sources of information and help to assist facilities that routinely handle chemical substances in their efforts to have secure and accident-free operations.

EXAMPLES

The following examples illustrate the range of damage that can occur at facilities handling hazardous substances because of criminal activity:

- A manufacturer uses flammable naphthalene to produce mothballs. Received in molten form, the naphthalene solidifies when cooled and looks similar to candle wax. Trespassing teenagers found the vats of naphthalene that were left outside to cool. They ignited the naphthalene and started an uncontrollable fire. Approximately 40 acres of industrial property burned, at an estimated cost of $100 million.
- Every few weeks, EPA receives reports that thieves, looking for ammonia to use to make illegal drugs, have broken into fertilizer dealers, refrigerated warehouses, or ice manufacturing facilities, frequently leaving valves open. In some cases, the thieves have been overcome by the ammonia and needed to be rescued; in other cases, the community has been evacuated, and there have been injuries to the general public and to law enforcement personnel from exposures to the released ammonia.
- There are cases where vandals have attempted unsuccessfully to break into chlorine tank cars. Fortunately, the design of the chlorine tank car includes a heavy steel dome and additional lock out devices that discourage even well-equipped vandals.

These examples illustrate the need to examine security measures at a facility, especially those handling highly hazardous substances, to guard against criminal acts, including vandalism.

AREAS OF CONCERN

Threats may come in different forms and from different sources. Threats from outside the facility could affect people and the facility itself, and may involve trespassing, unauthorized entry, theft, burglary, vandalism, bomb threats, or terrorism.

Threats from inside the facility may arise from inadequate designs, management systems, staffing or training, or other internal problems. These may include theft, substance abuse, sabotage, disgruntled employee or contractor actions, and workplace violence, among others.

Threats are not restricted to people and property, but could also involve sensitive facility information. Both facility outsiders and employees or contractors could pose threats to data storage and data transmission of, for example, confidential information, privacy data, and contract information.

They could also pose a threat to computer-controlled equipment. These threats may include breaches in data access and storage, uncontrolled dissemination of information, destruction of information or threats to automated information systems.

COMMON SECURITY MEASURES

Most security measures are intended to prevent intruders from gaining access to the site or to limit damage. The following sections present a number of design and procedural approaches that facilities have successfully implemented.

The appropriateness of any one of these depends on site-specific conditions that you would need to consider in assessing any security needs for your facility.

PREVENTING INTRUSION

Most facilities have some measures that are intended to prevent intruders from entering the grounds or buildings. These measures may include fences, walls, locked doors, or alarm systems.

The location of the facilities and the types of structures will determine how much and what type of protection a facility needs.

In addition to basic measures, some facilities also provide physical protection of site utilities at the fence perimeter. Security lighting (good lighting around buildings, storage tanks, and storage areas) can also make it very difficult for someone to enter the facility undetected.

Some facilities augment these measures with intrusion detection systems — video surveillance, security guards at fixed posts, rounds/mobile patrols, alarm stations, and detectors for explosives and metal. If you have guards, it may be useful to consider their training in detection and response and the availability to them of equipment for appropriate protective force.

To protect against unauthorized people coming in through normal entrances, security clearances, badges, procedures for daily activities and abnormal conditions, as well as vehicular and pedestrian traffic control, can provide efficient access for employees while ensuring that any visitors are checked and cleared before entering.

Most facilities have procedures to recover keys from employees who leave and to immediately remove the employee's security codes from systems. At times it may be wise to consider additional measures, such as changing locks, when a disgruntled employee leaves.

LIMITING DAMAGE

In addition to protecting a facility from intruders, it is important to limit the damage that an intruder (whether physically at the site or "hacking" into the company's computers) or an employee could do. Most of the steps to limit damage are probably things you already do as part of good process safety management, because they also limit the loss of chemicals if management systems or equipment fails or an operator makes a mistake. These steps can be related to either the design of the facility and its processes or to procedures implemented.

Facility Design

A well-designed facility, by its layout, limits the possibility that equipment will be damaged and, by its process design, limits the quantity of chemical that could be released. Facility and process design (including chemicals used) determine the need for safety equipment, site security, buffer zones, and mitigation planning. Eliminating or attenuating to the extent practicable any hazardous characteristic during facility or process design is generally preferable to simply adding on safety equipment or security measures.

The option of locating processes with hazardous chemicals in the center of a facility can thwart intruders and vandals who remain outside the facility fenceline. Transportation vehicles, which are usually placarded to identify the contents, may be particularly vulnerable to attack if left near the fenceline or unprotected. However, for some facilities and processes, the option of locating the entire process at the center of the site may not be feasible. You may need to consider external versus internal threats, such as the threat to workers if an accidental release occurs, or the access to the process in case of an emergency response.

Where feasible, providing layers of security will protect equipment from damage. These layers could include, for example, blast resistant buildings or structures. Enclosing critical valves and pumps (behind fences or in buildings) can make it less likely that an intruder will be able to reach them, a vehicle will be able to collide with them, or that releases are compounded because of damage to neighboring equipment.

Chlorine tanker valves are an example of equipment design with several layers of security: (1) a heavy steel dome with lid; (2) a heavy cable sealing system that requires cable cutters to remove; (3) a heavy duty valve that can withstand abuse without leaking; and (4) a seal plug in each valve. As many as three different tools would be needed to breach the container's integrity.

If equipment is located where cars, trucks, forklifts, or construction equipment could collide with it or drop something on it, the equipment should be constructed from materials that could stand some abuse. In general, you should give consideration to collision protection to any equipment containing hazardous chemicals with, for example, collision barriers.

The idea of layers of security may also be applied to communications/computer security. Some companies have developed alternate capabilities and systems to protect receipt and transmission of confidential information. Backup power systems and/or conditioning systems can be important, particularly if processes are computer controlled. Access to computer systems used to control processes may need to be controlled so that unauthorized users cannot break in; appropriate computer authentication and authorization mechanisms on all computer systems and remote access may prove useful; entrance into control rooms may need to be monitored and limited to authorized personnel. For emergency communications, some companies use radios and cell phones as a backup to the regular phone system.

Well-designed equipment will usually limit the loss of materials if part of a process fails. Excess flow check valves, for example, will stop flow from an opened valve if the design flow rate is exceeded. These valves are commonly installed on chlorine tankcars and some anhydrous ammonia trailers, as well as on many chemical processes. Like excess flow valves, fail-safe systems can ensure that if a release occurs, the valves in the system will close, shutting off the flow. Breakaway couplings, for example, shut off flow in transfer systems, such as loading hoses, to limit the amount released to the quantity in the hose.

If you store hazardous liquids, you may want to consider containment systems (e.g., buildings, dikes, and trenches) that can slow the rate at which the chemical evaporates and provide time to respond. Double-walled vessels can also protect against attempts to rupture a tank.

The installation of chemical monitors that automatically notify personnel of off-hour releases could be important if your facility is not staffed during certain periods (e.g., overnight). Such monitors, however, are not available for all chemicals. The appropriateness of monitors, and any other equipment design solutions, will depend on site-specific conditions.

Procedures and Policies

Your facility's policies and procedures can also limit the damage caused by a release. As with design issues, the procedural steps you routinely take to operate safely also help protect your facility from attacks. Maintaining good labor relations may protect your facility from actions by either employees or contractors. Open negotiations, workplace policies emphasizing that violence and substance abuse are not tolerated, and adequate training and resources to support these policies are important considerations. The goal is to develop a workforce and management capacity to identify and solve problems by working together. Following are several examples of specific areas where procedures and policies can prevent or limit the damage of a release.

As a matter of good practice, as well as site security, you may consider disconnecting storage tanks and delivery vehicles from connecting piping, transfer hoses, or distribution systems when not in use. Leaving the tanks linked to the process or pipeline increases the chance of a release because the hoses or pipes are often more vulnerable than the tanks.

In addition to accurately monitoring your inventory, another practice you may want to adopt is limiting the inventory of hazardous materials to the minimum you need for your process. This policy limits the quantity of a hazardous material that could be released. You could also consider actions such as substituting less hazardous substances when possible to make processes inherently safer.

Your written procedures are also an important tool in protecting your facility. As part of your regular operating procedures, you probably have emergency shutdown procedures. These procedures, and workers trained in their use, can limit the quantity released. The procedures are particularly important if you have processes that operate under extreme conditions (high or low pressures, temperature) where rapid shutdown can create further hazards if done improperly.

As you review your contingency plan, consider, if necessary, revisions to address vandalism, bomb threats, burglary - including evaluating the desirability of your facility as a target - working with local law enforcement, and providing extra security drills and audits. Many companies find that working with local law enforcement is an effective means of evaluating security risks.

As a matter of good practice, for both process and response equipment, it is important to have a program that ensures that all equipment is subject to inspection and to corrective and preventive maintenance. In this way, you can be sure that the safety systems you install will operate as designed.

SITE-SPECIFIC DECISIONS

The steps you take to operate safely will often serve to address security concerns as well. Considering inherent safety in the design and operation of any facility will have the benefit of helping to prevent and/or minimize the consequences of any release.

Before taking steps to improve site security, you may want to evaluate your current system and determine whether it is adequate. Factors you might consider include:

- The chemicals stored at your site; some chemicals may be particularly attractive targets because of the potential for greater consequences if released.
- The location of the site; sites in densely populated areas may need more security than those at a distance from populations.
- The accessibility of the site; are the existing security systems (e.g., fences, security lighting, security patrols) adequate to limit access to the site?

- The age and type of buildings; older buildings may be more vulnerable because they have more windows; some newer building are designed for easy access.
- Hours of operation; a facility that operates 24-hours day may need less security than a facility that is unoccupied at night.

Decisions about improving site security should be made after evaluating how vulnerable your site is to threats and what additional measures, if any, are appropriate to reduce your vulnerability. Each facility should make its own decision based on its circumstances.

IT IS YOUR DUTY

If you produce, process, handle, or store extremely hazardous substances you have, under the Clean Air section 112(r)(1), a general duty "to identify hazards which may result from such releases, using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."

INFORMATION SOURCES

Several organizations (e.g., ASTM, ANSI) have standards for site security or include site security issues in their codes. The National Fire Protection Association (NFPA) has a standard NFPA- 601, Standard for Site Security Services for Fire Loss Prevention. The American Petroleum Institute addresses security issues in RP 554, Process Instrumentation and Control. Likewise, the Chemical Manufacturers Association addresses this issue through the Responsible Care Employee Health and Safety Code Site Security Management Practice. Protocols developed under the Responsible Distribution ProcessK cover security concerns. You can contact the following websites for additional security information:

- The Energy Security Council is a national industry association to assist law enforcement agencies and energy companies in combating all types of criminal activity.
- The National Fire Protection Association provides standards, research, training, and education to reduce the burden of fire and other hazards
- The National Safety Council provides general safety information on chemical and environmental issues.
- The American Society for Industrial Security develops educational programs and materials that address security concerns. Its Security Management Magazine site provides an online version of its magazine.
- The Security Industry Association provides general security information.
- The Agency for Toxic Substances and Disease Registry site provides a 10-step procedure to analyze, mitigate, and prevent public health hazards resulting from terrorism involving industrial chemicals.
- The Center for Chemical Process Safety (CCPS) is an industry-driven, non-profit professional organization affiliated with the American Institute of Chemical Engineers (AIChE). It is committed to developing engineering and management practices to prevent or mitigate the consequences of catastrophic events involving the release of chemicals that could harm employees, neighbors and the environment.
- The National Institute for Occupational Safety and Health provides multiple resources on workplace violence prevention.
- The Complete Manual of Corporate and Industrial Security, by Russell L. Bintliff (Prentice Hall, 1992) provides detailed discussions of the advantages and disadvantages of various security systems as well as checklists for security inspections.
- The Handbook of Loss Prevention and Crime Prevention, 3rd Edition, L.J. Fennelly, Ed., (Butterworth-Heinemann, 1996) includes information on conducting security surveys as well as chapters on a broad range of security subjects.
- Guidelines for Investigating Chemical Process Incidents. (AIChE/CCPS). These Guidelines establish a basis for successful investigation of process incidents to determine causes and implement changes, which can prevent recurrence. Primary focus is on incidents with catastrophic potential but the concepts should also be used for investigating environmental incidents, minor injuries, less significant property damage events, or near misses.
- Process Plants: A Handbook for Inherently Safer Design, by Trevor Kletz. (Taylor & Francis 1998) illustrates the principles of inherent safety and demonstrates the advantages of considering safety approaches in the design stages of a process.
- Inherently Safer Chemical Processes: A Life Cycle Approach. (AIChE/CCPS) This book presents the principles and strategies for applying inherently safer thinking from the start of the life cycle to the very end.

STATUTES AND REGULATIONS

The following are a list of some federal statutes and regulations related to process safety management and accident prevention:

EPA

Clean Air Act (CAA)

- General Duty Clause [Section 112(r)(1) of the Act] - Facilities have a general duty to prevent and mitigate accidental releases of extremely hazardous substances.

- Risk Management Program (RMP) Rule [40 CFR part 68] - Facilities that have a listed toxic or flammable substance above a certain threshold are required to develop a hazard assessment, a prevention program, and an emergency response program.

Chemical Safety Information, Site Security and Fuels Regulatory Relief Act

- A major provision requires the Department of Justice to submit reports to Congress describing the effectiveness of the RMP regulations in reducing the risk of criminally caused releases, the vulnerability of facilities to criminal and terrorist activity, and the security of transportation of substances listed under CAA Section 112(r).

Emergency Planning and Community Right-to-Know Act (EPCRA)

- Emergency Planning [40 CFR part 355] Facilities that have listed chemicals above a certain threshold must report to their Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC) and comply with certain requirements for emergency planning.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- Under the authority of CERCLA, EPA's Chemical Safety Audit program examines site security as part of a standard audit protocol.

Clean Water Act (CWA) as Amended by the Oil Pollution Act of 1990 (OPA)

- Spill Prevention Control and Countermeasures Plan (SPCC) [40 CFR part 112] - Facilities storing oil above a certain threshold must prepare and implement an SPCC plan. These plans need to address security elements such as locks, guards, access, lighting, and vandalism.

OSHA

- General Duty Clause [OSH Act section 654] Employers are required to provide a safe workplace free of recognized hazards.
- Process Safety Management (PSM) Standard [29 CFR 1910.119] - Facilities that have a highly hazardous substance above a certain threshold are required to implement a number of actions to manage hazards including performing a process hazards analysis and maintaining mechanical integrity of equipment. External threats must be considered when conducting a process hazard analysis.
- Hazard Communication Standard [29 CFR 1910.1200] - Facilities handling hazardous chemicals must maintain information on the hazards and train employees in how to handle the chemicals safely and protect themselves if exposed.

Other OSHA regulations address some security issues for specific types of hazardous materials (e.g., flammables).

Department of Transportation

The US Department of Transportation has a number of regulations that address security at transportation terminals. These regulations can be found in Titles 14, 33, and 49 of the Code of Federal Regulations.

COMMUNITY SAFETY AWARDS PROGRAM: Lake County, Indiana LEPC

HOME

RMP Network is designed to share successful practices in RMP implementation, risk communication, and use of the data. The projects detailed in RMP Network are easily reproducible, low cost and promote partnership-building in the community. This fact sheet does not provide extensive information about a project. Rather, it is intended to help stakeholders generate ideas, identify tools and pinpoint funding sources for accident preparedness and prevention initiatives.

Purpose

The Lake County, Indiana, Local Emergency Planning Committee has implemented a Community Safety Awards Program to recognize significant achievements by industry and municipalities in reducing risks to the public from chemical accidents. The LEPC has implemented a Community Safety Awards program that encourages industry representatives, among other things, to partner with other companies to ensure compliance and to discuss and share Risk Management Plan (RMP) data, information gathered under the Emergency Planning and Community Right-To-Know Act, and other hazard-related information with the public.

Background

Lessons learned from a controversy stemming from the transportation and incineration of U.S. Navy surplus napalm at a facility located in Lake County spurred the LEPC to find new approaches to risk management. Building on Department of Energy-prepared materials, the LEPC developed a training program for emergency response to radioactive material incidents. The LEPC plans to incorporate RMP data into its other emergency management efforts.

Partnerships

The Lake County LEPC sponsored an RMP Working Group that includes: BP AMOCO Whiting; U.S. Steel-Gary Works; Ispat Inland; Rhodia Chemical; Bethlehem Steel; Keil Chemical; Cerestar USA; and Grand Calumet Task Force (a local environmental group). The partners exchanged technical reporting approaches to ensure consistency, held a joint public exposition to release information on facility RMPs, and fostered the formation of an Industrial Emergency Response Network comprised of 10 companies. The Network meets monthly to coordinate emergency response and training efforts among the participating companies.

Funding

Approximately $1,500 was used as seed money for the Awards Program.

Awards Criteria

Annual awards are given to industry and municipalities for risk reduction in any of the three areas:

- Chemical Accident Prevention - lowering the potential for chemical accidents through reductions in the use of hazardous chemicals. Examples include: substitutions of a hazardous chemical with a less hazardous chemical or reductions in chemical use. Entries are judged primarily on elimination of or reduction in accident scenario vulnerability zones around the facility. Chemical substitutions are favored over storage reductions that may increase deliveries.
- Emergency Preparedness - improvements to accident response preparations that minimize risks to communities if a chemical accident occurs. Examples include: installation of community warning systems, well-executed emergency drills or table-top exercises and safety inspections by local emergency responders and LEPC members.
- Community Outreach - productive and innovative efforts that inform the public about chemical accident risks and respond to public suggestions about reducing those risks. Examples include: significant achievements by community advisory panels or facilitating public access to information such as RMPs, TRI reports, or emergency response plans. Achievements will be judged by the amount of public participation generated and whether the project surpassed regulatory requirements or simple public relations techniques.

HOW TO DEVELOP A HEALTH ALERT NETWORK: Baton Rouge, Louisiana LEPC

HOME

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Purpose

The geographic location of the East Baton Rouge Parish makes it likely that natural disasters, such as floods, tornados, or hurricanes will occur. The region also has been declared a "High Risk" area for enemy attack and participates in the federal domestic preparedness program. The health alert network seeks to enhance the capabilities of local officials and emergency responders in incidents involving nuclear, biological and chemical terrorism. The Baton Rouge Local Emergency Planning Committee has identified people and equipment resources that may be needed during or following a deliberate or natural biological event.

Partnerships

The Director of Emergency Preparedness serves as the chairperson for the LEPC. The LEPC formed a Health Care Subcommittee that is chaired by the coroner and includes a psychologist, a pharmacist, an epidemiologist, a nurse, an emergency medicine physician, and others. The group is working to enhance their Metropolitan Medical Response System. This project could serve as a pilot to develop a national health alert network to deal with public health issues surrounding deliberate and natural biological events. The federal Center for Disease Control is interested in developing software aimed at helping State and local officials identify patterns of symptoms that could be identified quickly should an individual be exposed to biological contaminants.

Resources

The East Baton Rouge Parish LEPC does not have an operating budget or generate funds through an industry fee program. Grants awarded through federal and state programs provide funding for projects, which are developed and implemented through the LEPC. Partnerships serve as an additional source of funding for program implementation and development.

Tips on Setting up a Medical Response System

The East Baton Rouge LEPC offers the following tips:

- Work toward a cooperative community effort;
- Incorporate the resources and response from jurisdictions that serve in a mutual aid capacity;
- Take a unified approach to communications and training;
- Build relationships with your neighboring communities. Remember, response may often spread outside your jurisdictional boundaries;
- Involve the right people. Include individuals from the public health service; public and private hospitals; other health-care facilities; departments of emergency medicine, veterinary medicine, and the coroner’s office; environmental agencies and citizen groups.

Focus initially on the key components of coordination and response; available community resources; first-responder education; coordination of plans and operating procedures; and communications and coordination of information.

HAZARDOUS MATERIALS EDUCATION: Carbon County, Pennsylvania, LEPC

HOME

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Rather, it is intended to help stakeholders generate ideas, identify tools and pinpoint funding sources for accident preparedness and prevention initiatives.

Purpose

The Carbon County, Pennsylvania, Local Emergency Planning Committee has developed educational programs to involve area school students in hazardous material issues.

LEPC members have a philosophy that if the children in the community are continually learning about chemical accident prevention and emergency preparedness, their parents will become involved as well.

Led by a local television anchor who is a member of the LEPC, the committee has worked with the local school system to develop programs to educate students and teacher on how to shelter in place and other emergency procedures.

Framing the Message

The LEPC realized that it was important to explain to teachers and students why chemical release emergencies differ from natural hazard emergencies, such as tornados and floods, and why safety procedures may differ.

Equally important was ensuring that students knew the proper safety procedures to follow for evacuation and shelter-in place in the event of a chemical accident.

Knowing it was also important to educate students as to why shelter-in-place is advantageous in some situations, during a classroom session, LEPC members blew large soap bubbles over the students to show how the quickly the wind can spread chemicals and why evacuation may not always be an option.

Students also learned that evacuation and shelter-in-place are not interchangeable safety measures and when emergency management officials determine appropriate action for the incident, they should follow those directions implicity.

Next, families learned what they would need to do in their home if they got the message to shelter-in place to keep contaminated air from entering doors and windows and how to protect themselves during a chemical release.

The LEPC and 11 area companies sponsored a logo contest that culminated in a calendar using the art work of students.

The calendar contained emergency contact telephone numbers, LEPC information and detailed instructions on what steps to take should an accident occur.

Students from throughout the county were asked to draw pictures describing what people should do if a chemical accident occurred.

Twelve winners were chosen and their artwork was featured in the calender.

Community residents received a free calendar and the calendar was shared with other Pennsylvania LEPCs.

Funding

Each of the 11 companies paid $100 fee to place an advertisement in the calender.

The LEPC also used some of the funds garnered from annual fees paid by companies that must comply with the state right-to-know law

(Note: The county requires facilities to pay annual fees that range from $35-75 per chemical for filing Tier II reports and $100 from each facility for which EPCRA requires an emergency response plan).

HAZARDOUS MATERIALS EDUCATION: North Central Florida LEPC

HOME

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Purpose

The North Central Florida Local Emergency Planning Committee annually holds a Hazardous Materials Spill Prevention Week to educate the public about hazardous chemicals stored and used in their community. The Clean Air Act Section 112(r) Risk Management Program (RMP) expands the focus of the LEPC from primarily planning for emergency responses to accidental hazardous materials releases to playing an active role in preventing spills. Hosting a spills awareness week gives the LEPC an opportunity to increase awareness of the requirements and opportunities of this new program. In 2000, the LEPC distributed instructions on sheltering-in-place and evacuation that the public may be asked to take during a spill or chemical release.

Outreach

Counties, municipalities, and school boards proclaim the week as a public education effort. The LEPC district covers 55 local governments in 11 counties, covers 7,000 square miles, and serves a population of 434,000. The LEPC also posts information on its website regarding the various activities that occur during Spills Week. Additionally, letters are sent to newspaper editors with a reminder that hazmat is an important public safety issue and notices are placed about availability of chemical use and storage information. In 2000, the LEPC also will host a booth at the North Central Florida Hurricane Response Exhibition, which features a hurricane hunter aircraft. In 1999, 6,000 individuals attended the Expo and attendance in 2000 is expected to top 10,000.

Funding

The budget runs around $400, excluding staff time. Some funding was donated directly by industry and the remainder was from funds obtained through a State fee system set up under the Emergency Planning and Community Right-To-Know Act to support hazmat planning. Florida annually collects nearly 2 million dollars from companies that submit hazardous materials reports. Each of the State's 11 LEPCs receive approximately $45,000 in funds.

Benefits

Site-specific hazards analyses were updated using CAMEO software and available Tier II information. The reports were distributed to facilities during spills awareness week. In the past, compliance seminars have been held and local governments were encouraged to send employees to free hazmat awareness classes. Typically, requests for right-to-know information increase following a spills awareness week. New LEPC members have been recruited from people that learned about the organization during an awareness week activity. In 1999, over 200 people attended the Gainesville Safety Street, which concluded Spill Prevention Week. One-third of the attendees were citizens seeking more information about the local impacts of the RMP program.

Available Materials

The Hazardous Materials Spill Prevention Week is the focal point of the LEPC's public education and outreach efforts. The following documents are available on the LEPC website at www.ncflepc.org:

- LEPC proclamation for Hazardous Materials Spill Prevention Week;
- Resolution for cities, counties, and school boards;
- Spill prevention/hazards analysis memo to facilities;
- News release to the local media;
- Letter to the Editor about Spill Prevention Week;
- Year 2000 Hurricane Hunter Exhibition; and
- Annual public data availability notice (EPCRA Section 324)

You are encouraged to duplicate these materials to sponsor your own spills awareness week.

HOW TO INCREASE PUBLIC AWARENESS AND IMPROVE EMERGENCY NOTIFICATION: Beach Cities CAER (Community Awareness and Emergency Response)

HOME

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This factsheet does not provide extensive information about a project. Rather, it is intended to help stakeholders generate ideas, identify tools and pinpoint funding sources for accident preparedness and prevention initiatives.

Purpose

Beach Cities CAER is a nonprofit group comprised of local businesses, industries, emergency response organizations (first responders and police), utilities, educators, medical facilities, and the public.

Located in Southern California, the group is open to members located in the cities of El Segundo, Hawthorne, Manhattan Beach, Torrance, Gardena, Hermosa Beach and Redondo Beach.

There are eight chemical and petrochemical companies, three utility companies, nine emergency assistance organizations, five school districts and one major hospital involved in the organization.

Over the past decade, the City of Torrance has worked with chemical and petrochemical companies to develop and install warning sirens and other tools to be used throughout the community in case of a chemical emergency.

However, a greater public understanding of the warning system and appropriate response actions was needed.

The Community Warning System public awareness campaign was developed to teach Torrance residents how to identify a chemical release and how to respond should a chemical emergency occur.

Partnerships

Two chemical companies and one petrochemical company, along with Beach Cities CAER, the City of Torrance and the Torrance Unified School District sponsored the Torrance Community Warning System public awareness campaign.

The warning system targets the entire city, which is the location of a number of smaller chemical companies that were not directly involved in sponsoring the outreach campaign.

Budget

The budget was approximately $75,000, which was funded by the industrial companies involved with the campaign.

Beach Cities CAER suggests the following tips:

- Identify all tools, systems and procedures and pull together into one unified warning system;
- Conduct community discussion groups and distribute a survey to registered voters to determine their information needs and information access preferences;
- Develop outreach materials including: color guide (student version and adult version); stickers for home and car; teacher kits; press release and advertising campaign;
- Brief news reporters and kick off the campaign at a press conference at a local elementary school following a shelter-in-place drill;
- Send student-version warning system guides home to parents. Reward students with a “free French fries” coupon if they return a signed tear-off sheet in the guide indicating that they had reviewed the material with their parents (approximately 3,500 students returned sheets);
- Run large advertisements in local newspaper for six consecutive weeks to alert readers to check their mail for the guide;
- Mail adult-version guides to all residential and business addresses in your locality;
- Meet with the School District; City Council; homeowner associations; representatives of private schools, day-care facilities, senior-citizen centers, and senior citizen care and medical facilities;
- Establish a phone bank to handle calls during emergencies and to determine what additional training may be needed;
- Produce and air a program on city cable channel (repeat the program periodically); and
- Design and implement an annual refresher course.

Challenges

The group identified the following challenges:

- Large transient population (night time residential population is approximately 130,000, daytime population approximately 500,000);
- Diverse ethnic population , over 60 dialects are spoken, lending to language barriers in communication tools and the need for multiple communication techniques

(mailings, newspaper articles, cable television, community meetings);
- Condensation of pertinent information into readable and friendly language and in an accessible format; and
- Need to identify additional audiences and to develop refresher communication to initial audiences.

Increased Awareness

In June 2000, the Community Warning Siren was used for the first time to warn the community of a chemical release.

Schools within the 1.2-mile radius of the warning siren sheltered in place and waited for the all-clear signal.

Many neighboring businesses sheltered in place.

While some of the calls that came into the phone bank during the emergency indicated the need for additional training; many residents indicated they had followed the appropriate procedure and had sheltered in place.

Callers then requested specific information regarding the incident as well as next steps.

HOW TO MAINTAIN COMMUNITY CONFIDENCE: Eastman Kodak Company, Kodak Park, Rochester, N.Y.

HOME

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Background

Kodak Park, in Rochester, N.Y., is Eastman Kodak's largest manufacturing complex. The site is located in the midst of a highly-urbanized area that includes thousands of households and businesses. Over the years, eliminating the use of some highly hazardous substances, substituting less hazardous materials, and reducing the storage or use of hazardous materials has significantly reduced potential chemical hazards at the site. As a result, the company's RMP covered only two processes - one involving a formaldehyde tank and the other involving a storage tank of highly flammable vinylidene chloride. The RMP also required the facility to report on the "worst case" impact to neighboring communities for these two chemicals. Worst-case scenario reporting had the potential to be a community relations nightmare. However, actions taken prior to 1999 had minimized or eliminated risks from handling or storage of chemicals.

Public Outreach

Five times a year, the company mails a newsletter to approximately 13,500 plant neighbors and 10,000 employees that includes information about developments at the facility. Additionally, a staffed on-site Neighborhood Information Center is open Monday through Friday to anyone seeking information about Kodak Park-related issues. At the center, the public can obtain information such as material safety data sheets, risk management plans and other health and safety-related information. Community residents also can ask one of the center's staff to give further explanation or answer questions about chemical hazards. Citizens also can call a 24-hour hotline to voice concerns about plant operations. A Community Advisory Council, with members representing local government, local schools, plant neighbors, and special interest groups meets monthly to discuss issues raised by the community and other topics suggested by plant personnel.

Challenges

Kodak identified the following challenges:

- High profile company in the community;
- Active local public advocacy groups; and
- How to demonstrate the two "Ps -prevention and preparedness" in the context of RMP.

Results

Outreach helped Kodak Park retain a high level of community support - an annual survey of neighbors showed that 95% agreed the company was an asset to the community, while 89% agreed that the facility cooperated with government to insure health and safety. Despite the absence of community concerns, the company eliminated any off-site impact from worst-case scenario releases covered under RMP. This was accomplished by installing improved containment capabilities at a chemical handling facility.

Budget

Kodak Park has an annual $100,000 budget for community relations activities, such as a newsletter, community survey, public meetings, and citizen advisory council.

Tips For Enhancing Community Relations

Kodak Park suggests the following tips:

- Know your public: plant employees, other industries, local safety personnel, media, government officials, neighborhood groups and other interested individuals, school, hospitals, and nursing homes.
- Communicate early and often! Key messages should be clear and concise and come directly from you to avoid "filtering" by others.
- Tell the public what you are doing to prevent accidents and prepare to handle emergencies that do occur.
- Develop a system for keeping the public routinely informed about plant operations.
- Participate in community activities.
- Utilize newsletters, letters, brochures, meetings, and open houses to get your message out.
- Develop a mechanism to get citizen feedback.

MENTORING PROGRAM ENHANCES SAFETY: Lehigh Valley, Pennsylvania

HOME

RMP Network is designed to share successful practices in RMP implementation, risk communication, and use of the data. The projects detailed in RMP Network are easily reproducible, low cost and promote partnership-building in the community. This factsheet does not provide extensive information about a project. Rather, it is intended to help stakeholders generate ideas, identify tools and pinpoint funding sources for accident preparedness and prevention initiatives.

Purpose

The Lehigh Valley/Industry Mutual Aid group took action following a fatal explosion at a chemical plant in Allentown that left five workers dead and several other people injured. One of the fatalities occurred in an adjacent business in the industrial park near the Lehigh Valley International Airport. The explosion leveled the plant, seriously damaged nearly a dozen buildings in the industrial park and caused at least $4 to $5 million in damage. The accident spurred the group to initiate a mentoring program aimed at strengthening the safety performance of new “start-up” businesses.

Through the mentoring program small businesses will receive helpful compliance information about environmental, health and safety regulations. Another goal is to ensure local businesses are providing a safe work environment.

Partnerships

The Lehigh Valley in Pennsylvania boasts several highly industrialized cities including Allentown and Bethlehem. The area is rapidly growing as many new businesses and high-tech industries are re-locating from the New York City metropolitan area to the valley.

One of the challenges facing emergency responders and planners is to ensure that new businesses are following safe practices, particularly during the start-up phase of production. The Lehigh Valley/Industry Mutual Aid group is comprised of representatives from the LEPC and local industry.

Targeting Businesses

The group has identified 278 companies in the valley that manufacture, use, or handle chemicals. The list was compiled from a search of a telephone database and EPA’s EnviroFacts database. The group’s objective is to approach companies with the positive aspects of making safety and health a priority and improving their overall safety programs.

What Companies Need To Know

The group has determined what services or outreach materials should be provided. In addition to providing general compliance information, the group wants to provide small businesses with:

- Worker exposure concentrations;
- Basic industrial hygiene practices;
- Respiratory protection requirements;
- Fire protection requirements;
- Spill control requirements; and
- Compatibility of chemicals on site.

Challenges

LEPCs carry out the emergency planning and community right-to-know aspects of EPCRA and are a source of information about chemical risks in the community. Therefore, mentoring project participants are ever watchful that the project does not usurp the authority of the LEPC. Finding enough funding without using monies already earmarked for emergency response is an additional challenge. Additionally, some small businesses may not want to participate in the program because they fear: loss of proprietary business information; compliance costs; and inspections and penalties from a government enforcement agency.

Next Steps

The group will:

- Survey identified businesses to determine if they have conducted a hazards analysis;
- Contact State agencies and others such as universities to identify small companies;
- Work with community colleges to offer courses on chemical safety and regulatory compliance; and
- Gain buy-in from other area companies.

SOUTH CAROLINA SMALL BUSINESS ASSISTANCE PROGRAM: RMP Air Modeling Project

HOME

RMP Network is designed to share successful practices in Risk Management Program (RMP) implementation, risk communication, and use of the data. The projects detailed in RMP Network are easily reproducible, low cost and promote partnership-building in the community. This fact sheet does not provide extensive information about a project. Rather, it is intended to help stakeholders generate ideas, identify tools and pinpoint funding sources for accident preparedness and prevention initiatives.

Purpose

The South Carolina Small Business Assistance Program's (SBAP) RMP Air Modeling Project helped participating small businesses and small municipalities complete their RMP Offsite Consequence Analysis. The RMP requires approximately 36,000 facilities to provide important accident prevention data to the public beginning June 21, 1999. RMP facilities are required to give EPA information on their hazard assessments (including Offsite Consequence Analysis), accident prevention activities, five-year accident history, management systems, and emergency response plans. All information except the Offsite Consequence Analysis will be made available to the general public via the Internet.

Partnerships

The South Carolina SBAP partnered with technical staff in the Bureau of Air Quality (under the Department of Health and Environmental Control) to develop and operate the compliance assistance program. They also worked with the State Propane Board and State Fire Marshall's Office to publicize the program.

Funding

Approximately $5,000 was obtained from Clean Air Act Title V permit fees paid by industry.

Time Commitment

Estimates ranged from five minutes to 30 minutes for completion of each facility's air modeling, depending on the complexity of the facility. Questionnaires were mailed to 450 qualified small businesses and municipalities. The SBAP offered to perform the air dispersion modeling required under the RMP's Off-site Consequence Analysis. To qualify, a business had to employ less than 100, be privately owned and operated, and not be a major source as defined by the CAA. Confidentiality was guaranteed by SBAP. Sixty-four small businesses and municipalities took advantage of the free compliance assistance program and submitted key information about their RMP-covered chemicals. A printout was sent to each participating facility within two weeks that included RMP distance to endpoint values which could be incorporated directly into the facility's RMPlan. Additional facilities came into the program as a result of word-of-mouth publicity. As a result, SBAP discovered that small municipalities generally were unaware of RMP requirements and determined that additional outreach was necessary.

Technologies

RMP*Comp, free-of-charge software developed by EPA, was used to perform off-site consequence analysis modeling for the program participants. This software takes the guess work out of calculating RMP's Offsite Consequence Analysis - it makes the same calculations electronically that would have to be done manually after following procedures in EPA's written guidance. RMP*Comp generally gives conservative modeling results so that companies can be assured that they are within acceptable endpoint limits.

Challenges

SBAP received assistance from partners in the South Carolina DHEC to target small businesses that met the core requirements for assistance. Since the regulatory program areas made no distinction between large and small businesses in their databases, the SBAP narrowed the DHEC list manually using industry guides. Also, the SBAP found that "mom and pop" businesses needed more assistance due to lack of access to the Internet.

Next Steps

On an ad hoc basis, the SC Small Business Assistance Program will help small businesses with their RMP air modeling updates after the June 21, 1999, initial compliance deadline.

HOW TO IMPROVE SAFE HANDLING OF CHEMICAL PRODUCTS: Sartomer Company, Exton, Pennsylvania

HOME

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Program Overview

The proper handling of chemicals during their entire life-cycle, product stewardship, is key to chemical safety. Sartomer assesses a new or potential customer's or distributor's ability to handle hazardous products safely by reviewing their environmental, health and safety (EHS) practices and, if warranted, making recommendations for improvements.

These reviews are conducted by sales personnel who prioritize customer visits based on the hazard of the product(s) purchased and the types of safety and environmental programs implemented by the customer.

Hazard Evaluation

Sartomer evaluates the overall hazard of its products by using a numerical rating system. Rankings are based on each product's acute health hazard, flammability hazard, reactivity hazard, chronic health hazard, and carcinogenicity hazard. "Category A" products, the products with the highest overall hazard, are considered first when prioritizing customer reviews.

For example, customers that use or purchase "category A" products would go to the top of the evaluation list. Customers that participate in an industry-sponsored safety program would be given a lower priority on the evaluation schedule.

Customer Relations

Sartomer maintains a relationship with its customers and distributors by following a philosophy of "cradle-to-grave" product stewardship or product responsibility. Distributors are considered an extension of the Sartomer sales force and receive health, safety and environmental information and training on Sartomer products. Sartomer also maintains a relationship with its distributors' customers as part of the commitment to product stewardship.

In addition, some Sartomer customers receive health, safety and environmental training at their site or at Sartomer headquarters. Sartomer personnel address specific customer questions or issues regarding the safety or environmental aspects of products. Sartomer's product stewards ensure that all customer issues are resolved.

Challenges

One challenge was to ensure that the product stewardship principles were adopted throughout the company, not just by the EH&S department. Sartomer resolved this challenge by designating business managers as product stewards and incorporating product stewardship responsibilities into various job functions throughout the company (e.g., sales, marketing, purchasing).

Sales and marketing personnel now include product safety in their discussions with customers and consider product safety issues when evaluating customers. Quarterly reviews between sales personnel and distributors now include EH&S/product safety as a key topic.

Tips

- Allow all functions of your business to provide input at the beginning of a product stewardship program so they will "buy into" the process.
- Integrate the new program into existing systems to avoid complexity and to gain wider acceptance and implementation of the program.
- This customer/distributor program is something any company, including small businesses, can adopt if the company is willing and prepared to implement product stewardship throughout the organization.

Chemical Safety Network -- EPA 550-F-01-002, April, 2001

WORK WITH YOUR LOCAL FIRE DEPARTMENT TO ENHANCE COMMUNITY SAFETY: The Cory Company

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Project Overview

The Cary Company stores and distributes chemicals and other products to facilities that use or make paint and coatings, printing ink, plastics, and rubber.

Some of the chemicals stored onsite include resins, driers, liquid latex, pigments and extenders.

The company has 45 employees and has not had any previous chemical incidents.

When the Cary Company decided to add a 140,000 square foot building at their Addison, Illinois, warehousing facility, company officials immediately turned to the local fire department for help.

The partnership was beneficial to both groups: the Addison Fire Department learned more about warehouse operations, which helps them prepare to respond should an accident occur; and the Cary Company would benefit as fire codes would be strictly adhered to during the design and building phases of the project.

The project was beneficial to the town of 32,000 individuals through the enhancement of fire safety.

Challenges

National Fire Protection Association code allows various options when designing a chemical distribution warehouse.

However the designer must make certain that the design conforms to the applicable standards.

There were many issues that factored into the design of the Hazardous Materials room.

The HAZMAT room was designed to safely store hazardous and flammable materials.

This was done correctly through steady coordination between designers, the Cary Company and the fire department.

In the HAZMAT room there are two sprinkler systems, a foam suppression system and an early suppression system which is designed to spray twice the amount of water a normal fire protection sprinkler yields.

In addition to the sprinkler systems the HAZMAT room was constructed with a dyke to contain any spills within the room.

The Cary Company had to be sure they met their own needs while following the NFPA code in the design, to ensure the highest level of safety.

When the Cary Company built their new facility much of the equipment was designed to exceed fire code requirements to insure protection for personnel and property.

The warehouse is equipped with heat sensors, 11 hose stations, 54 fire extinguishers, and a fire protection room. The fire protection room is self-contained with a dedicated alarm, phone line and electrical circuits.

The Addison Fire Department keeps a key to the fire protection room so emergency responders have 24-hour access to: MSDSs, maps showing electrical power switches and emergency contact phone numbers.

Although, the Cary Company has not had any previous accidents the company still considers that this project has reduced the likelihood of accidents.

The company's main concern is safety.

Accidents may happen, but the design of this HAZMAT room allows any accidental releases or fires to be dealt with quickly, thereby reducing the potential for any injuries or off-site releases.

Continuing Partnerships

The partnership between the facility and the local fire department has continued to enhance community safety and improve fire service training activities.

New fire service recruits visit the warehousing operation routinely to learn about the chemicals that are stored, see what protection measures are in place, and familiarize themselves about the hazards of warehouse operations.

The Cary Company donated $2,000 to the fire department to buy a special hazardous materials cart.

The HAZMAT cart has communications equipment and is equipped to repair holes in storage containers, decontaminate and remediate.

Company employees participate in fire department training to learn more about the safe handling of hazardous materials.

The facility is also working with other local businesses that are planning building additions to educate them about fire codes and other fire safety issues.

Cost Savings

The partnership helped to trim the company's bottom line by tackling design flaws early on.

Company officials estimate that $100,000 was saved by forming this partnership.

Tips

Companies should support and cooperate with the local fire department to ensure compliance with fire codes and fire safety programs.

Companies should share emergency response needs with the fire department to build consensus, prepare firefighters, and ensure the company's and community's safety.

THE LUBRIZOL CORPORATION: New Chemicals Issues Assessment

HOME

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Program Overview

Lubrizol has developed and implemented a program called the New Chemicals Issues Assessment (NCIA).

This assessment has helped bring a more consistent and formal review of the environmental, health, and safety (EHS) issues associated with new chemicals early in the development cycle.

NCIA Features

1. Formal and easy risk analysis process
2. Assessment of manufacturing operability issues in all phases of development
3. Initial analysis is performed by the research chemist and development engineer
4. Economic impact of EHS issues is incorporated in commercial decision-making
5. Updated analysis is conducted with the manufacturing engineer at the “commit to commercialization” stage

The adoption of this system has led to more efficient, less complex and inherently safer products and processes.

Instead of addressing EHS issues after new products and processes have been commercialized, it is more effective to do so early in the research and development phase.

Safety, Health, and Environmental

Lubrizol has successfully used this process to replace some raw materials with less hazardous materials, reduce volumes of waste streams, improve product quality and process control, and improve yields.

The NCIA process has also helped enhance the quality of information available for the decision to commercialize a product, including risk to employees, customers, the public and the environment.

Implementation

Implementing the process went more smoothly than anticipated because it was beneficial for everyone involved.

- Manufacturing personnel support NCIA because it helps ensure that material and process issues that would cause manufacturing difficulties are addressed during development.
- Process development engineers support NCIA because it helps them obtain a more complete understanding of the material and process issues at the beginning of project, leading to better processes in less time.
- Research chemists support NCIA because it gives their research a better chance of being commercialized.
- Research management and business groups support NCIA because it helps reduce the time and cost to develop processes for new chemicals.

Tips for smaller businesses

Using an effective and well-established process to address new chemical issues prevents errors by inexperienced personnel.

This can be especially beneficial in smaller organizations where there are few experienced personnel available to closely supervise newer employees.

Combining safety, health, environmental, and operability issues into a single assessment process reduces duplication of effort.

Decisions to cancel projects with obvious safety, health, regulatory, or processing problems may be made earlier, thereby redirecting resources to more attractive projects.

HOME

WASHINGTON SUBUBRAN SANITARY COMMISSION: Public Meeting Project

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Purpose

The Washington Suburban Sanitary Commission manages two water filtration plants and three wastewater treatment plants in the D.C., metropolitan area that submitted a RMP under section 112(r) of the CAA by the June 21, 1999, deadline. New requirements of the Chemical Safety Information, Site Security and Fuels Regulatory Relief Act required plants to hold a public meeting by Feb. 1, 2000, to discuss the implications of their RMPs, including the local implications of the Off-Site Consequence analyses. The Commission's Communications Office led the effort to hold public meetings at all five facilities.

Challenges

The team had to work with top level management and engineers to:

- Open plant doors and let the public see first-hand how safe facility operations are;
- Gain buy in to take a straight-forward approach to discussing worst-case scenarios;
- Develop plain language presentations of worst-case scenario information; and
- Help them understand how much public disclosure was allowed under the new law.

Public Notice

WSSC did extensive outreach to the 1.6 million people in their service area:

- Elected officials were briefed prior to the public meetings;
- Notices were posted on the Commission's website and published in local newspapers for two consecutive weeks prior to the meeting;
- Plant managers placed flyers announcing the meeting in local stores; and
- Civic leaders received invitations.

Meeting Sites

The meetings were held from 7:00 to 9:00 p.m. to encourage attendance. Hosting the meetings at the site allowed the public to take a quick tour of the plant and see the safety measures in place. Refreshments were served to allow time for informal conversations with plant employees.

Lessons Learned

Of the five meetings, only one was fairly well attended. Plant officials concluded residents were ambivalent about the RMPs because the facilities had a good safety record. Good community relations had been forged previously through annual Open Houses. Inviting the local fire chief to attend the public meeting helps calm any possible fears as the fire chief can answer questions about evacuation procedures.

Cost vs. Benefit

Approximately $10,000 per facility was spent on the briefings of elected officials, a focus group meeting, and the public meeting. A consultant was hired to help prepare the presentation, develop a brochure and advertisements for local papers. Benefits were increased credibility with local officials and employee interaction. One facility will host a training for local volunteer firefighters after learning that the unit lacked money for chlorine safety training. The greatest benefit was pulling employees from safety, engineering, and communications to work as a team. The team forged new relationships and increased understanding of a variety of viewpoints. Plant personnel, who rarely get a chance to speak with the public, had an opportunity to learn a new skill, and in every instance, it was their presentation that made the greatest impression on the audience.

Next Steps

WSSC will continue to nurture the newly formed relationships within the Commission, the public and elected officials through continued dialogue.

EPA OSWER 89-006.1, January, 1989, Series 6, No. 1

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

State of Kansas; Washtenaw County, Michigan; Butler County, Kansas; Jefferson County, Kentucky

ABOUT THIS BULLETIN

This is the first in a series of bulletins EPA is issuing to provide examples of SARA Title III (the Emergency Planning and Community Right-to-Know Act of 1986) programs and practices that are innovative or have proven to be effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and Title III implementing agencies throughout the country with the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferrable to other programs in similar communities or with similar situations. The bulletins will provide information on a variety of practices -- e. g., planning, information management, compliance, outreach. The particular topics covered in each program description are listed at the upper right hand comer of the first page of the description for easy reference.

The descriptions of the programs are not exhaustive. They are meant to provide readers with enough information to decide if a particular idea is possibly applicable to their own situation. Each description includes a contact person who can provide more detailed information and assistance.

KANSAS

SERC Profile

State characteristics: 105 counties are LEPDs

SERC: Cabinet officers heading 11 state agencies, 3 public representatives, 2 industry representatives; Chair: Lieutenant Governor

Topics: Leadership Outreach, Planning, Training, Hazards Analysis, Information Management, Funding, Compliance

Kansas is often cited as an example of a Title III program that is working well. The Kansas LEPCs report that they have received the help they need from the SERC.

The keys to this success at the state level are strong leadership and a conviction that Title III must be a way of life in Kansas, that because we live in a world with the potential for chemical exposure, Title III work must be ongoing.

SERC ACTIVITIES

Leadership. The chairman of the SERC is Lieutenant Governor Jack Walker, M.D., who has been very active, pushing the eight-person SERC staff to make the program work.

The other SERC members are heads of cabinet offices and high-ranking officials of industry and interest groups. The combination of SERC members who have the power to get things done and who are committed to the program has made it possible for the state to develop a proactive program with limited resources.

In the first month or two after the LEPCs were appointed, Kansas LEPC chairs were resigning with alarming frequency. The SERC members and staff realized that most of these people were confused by the totally new program and somewhat apprehensive of it.

They decided the key to making Title III work was to make the LEPCs comfortable, to give them all the help possible, to show them how to make it work.

The SERC staff spent a couple of months designing a program of training and outreach activities that would make it possible for 15 lay LEPC members to understand Title III and put it into action.

The result has been a Title III program that is working throughout the state.

Outreach. Kansas has produced a series of brochures and booklets to explain Title Ill:

- Guide to Community Right-to-Know Compliance under SARA and Kansas Laws explains how to determine if a facility must comply with the various Title III requirements and how to comply.
- Summary of Registered Pesticide and Pharmaceutical Products in Kansas lists the section 302 extremely hazardous substances by their trade names and lists the threshold planning quantities in gallons rather than pounds because farmers, in particular, deal in gallons and trade name products. The booklet even tells how many flea collars add up to the threshold planning quantity.

- Brochures directed to specific audiences -- e.g., small businesses, farmers -- to explain how Title III might affect them. These brochures have been given to the LEPCs to help them with their outreach programs, which the state has required them to carry out.

These booklets, developed for facilities, farmers, and the public, were distributed at special conferences, state fairs, trade shows, trade association meetings, and at public meetings. In addition, Kansas had public service announcements on radio and television.

Training. One of the principal methods the Kansas SERC has used to make the LEPCs comfortable with Title Ill and their responsibilities has been training.

Using State and Federal funding, the SERC has given its training courses at locations around the State. The SERC believes it has trained the largest number of people at the lowest cost of any state in its region. The SERC has provided courses in:

- Recognizing and identifying hazardous materials (six hour course);
- The pesticide challenge (Pesticides and Title III) (16 hour course);
- Hazardous materials contingency planning (40 hour course); and
- Hazards analysis (16 hour course).

Because the SERC mandated that each LEPC conduct a vulnerability analysis as part of its planning, the SERC decided it needed a course that thoroughly explained the Technical Guidance for Hazards Analysis, the "green book" prepared by EPA, FEMA, and DOT.

Students are asked to bring their own county and city maps as well as their lists of chemicals present in their community.

Planning. To help LEPCs prepare their plans, the SERC developed a plan with one county that other LEPCs could use as a sample.

The sample is not a "fill in the blanks" model. Instead it is an example showing LEPCs the types of letters that have been sent to facilities, the by-laws that have been adopted by another LEPC, and the methods used for hazards analysis.

While some parts of the plan may be adaptable, the main purpose of the sample is to show other LEPCs what a real plan for a Kansas LEPC looks like.

The SERC is also working with LEPCs on the draft plans so that the final plans submitted will be acceptable.

Hazard Identification. In further support of LEPC planning, the SERC has suggested at least two methods to be used to gather information for the hazards analysis described in the "green book." For smaller counties, the SERC has asked for a 12-hour road survey (see Butler County description below).

The LEPCs collect information on all the hazardous materials being transported in the county over a 12- hour period.

The method has been an effective tool for making the smaller counties realize that even if they lack industry they have hazardous materials and may have to respond to emergencies.

For the more populated areas the SERC has developed the Hazards Incidents Complexity Analysis. This method divides the area into 2 mile by 2 mile grids. For each grid, the LEPC collects historical accident data, information on special populations (e.g., hospitals, schools), and environmental factors such as aquifers.

The LEPC then rates the hazards in each grid in relation to the other grids to determine where the highest priorities should be assigned for the planning process. Although the method is not statistically valid, the SERC believes it creates an awareness of the problems.

Information Management. The SERC is developing an information management system that will depend on state rather than LEPC efforts.

The SERC believes such a system is needed because individual LEPCs are not able to handle large quantities of MSDSs. The state has purchased the HAZOX software package and given it to four counties as a pilot project.

The package contains the J.T. Kansas (cont.) Baker Chemical Library that provides standardized MSDSs for each chemical as well as EPA chemical profiles. Eventually, the SERC hopes to have a system that can be accessed and used by every LEPC.

Funding. The State legislature has passed a bill to fund the SERC program. Half the funds come from general revenues, the other half from fees.

Originally, the state intended to fund the entire program through fees, but decided that because the program benefits the public, they should share some of the burden. The following fees have been adopted:

- For section 311 lists, $23/facility.
- For each MSDS, $6.
- For Tier I forms, $6/facility.
- For Tier II forms, $9/report.
- For section 313 forms, $187 /facility.
- For annual filing of any section 311-313 forms, $2.

The state charges no fee for filing section 302 notifications. The state does not provide funding for LEPCs.

The Title III planning process has forced the counties to look at their resources and, in some cases, to write ordinances to give themselves enforcement powers. For example, some are adopting ordinances that make the responsible party pay for a cleanup.

Compliance. On October 18, 1988, the SERC published a list of LEPCs that have not completed plans. The SERC is also emphasizing that the LEPCs have a public safety responsibility: if the LEPC fails to develop a plan and an accident happens, it could be liable if people are hurt or property damaged when planning could have prevented it.

LESSONS LEARNED

Have a Broad-Based LEPC Membership. Inclusion of people who are not typically part of the emergency planning process has been critical to the success of the Kansas program.

These people ask the "simple" questions that need to be asked and they bring new ideas to the process.

The SERC has also come to realize that there is a great deal of misunderstanding on the part of local officials and responders about the type of assistance that would be available from the state and federal government.

Some LEPCs expect that the state or federal government will send a hazardous materials response team to handle incidents. The process of working with the LEPCs has been useful in educating them about their responsibilities. The planning process is also being used to focus on needed resources to be requested in county budgets.

Committed SERC the Key. SERC staff emphasize that the key to success is a committed, active SERC that makes the LEPCs comfortable.

WASHTENAW COUNTY, MICHIGAN

LEPC Profile

LEPC: 28 members (elected officials, law enforcement, fire fighters, medical, transportation, community and environmental groups, labor, education, agriculture, emergency response, facilities; chair: community representative)

Population: 272,000

Facilities: 41 to date, primarily related to the automobile industry and waste water treatment.

Topics: Funding, Information Management, Prevention

Washtenaw County passed its own right-to-know regulation through the Board of Health in 1986. Because of State preemption, however, the county did not begin enforcing it until 1988.

The law is broader than Title III in that it covers OSHA hazardous chemicals and chemicals on a State registry; the county, however, is dovetailing the program with Title III and using the information being gathered during inspections to help with the plan required under SARA section 303.

LEPC ACTVITIES

Funding. The county regulations allow the local environmental health bureau to inspect facilities that handle or store hazardous chemicals and charge a fee for the inspection.

Until 1990, facilities with aggregate amounts of toxic chemicals in excess of 275 gallons are required to report the presence of those chemicals; each reporting facility will be inspected. After 1990, the reportable quantity will become 27 1/2 gallons.

Fees range from $100 to $600 based on aggregate volume. The money collected through the fee system will pay for the inspectors and for the administration of the inspection program; the fees do not pay for Title III planning.

Prevention of Chemical Accidents. So far the inspections have uncovered a number of potentially dangerous situations that have since been rectified.

For example, one person who was running a business from his home had blasting caps stored in the house and dynamite stored nearby outside the house. Another inspection uncovered ten-years worth of hazardous waste improperly stored.

In addition, during their inspections, the local environmental health bureau has discovered that many facilities lack any detection systems to alert them to a leak.

The LEPC is advising facilities of the need for better equipment and is urging them to install detection systems that will monitor potential leaks and thus protect their employees and the community.

All efforts are coordinated with local fire departments that would cover these facilities in an emergency situation.

Information Management. The county has developed forms that in some respects parallel the Tier II forms required under section 312 of SARA.

These county forms for the reporting of the chemicals covered under the county regulation can then be used as worksheets for filling in the Tier II forms.

The county has offered seminars to help facilities fill in the forms.

LESSONS LEARNED

Local Regulations Help. The County's local Right-to-Know regulation has provided funding for the program and has allowed the LEPC to identify many more facilities that are covered under Title III than originally reported to the SERC.

The LEPC has been able to work with these facilities to provide them with the information they need to comply.

BUTLER COUNTY, KANSAS

LEPC Profile

LEPC: 20 members (includes three county commissioners, health department, media, industry, county director of the environment)
Population: 48,000
Facilities: 1 major refinery
Topics: Hazards Identification Survey, Transportation, Outreach

Butler is a relatively rural county in southeastern Kansas. When the LEPC began its Title III work, members assumed that few hazardous substances were used or stored in their community. The county, however, has five major highways, two railroad lines, and 800 miles of pipelines.

LEPC ACTIVITIES

Hazards Identification Survey. The Butler County LEPC conducted a 12-hour survey to identify hazardous materials transported in or through the county. To carry out the survey, the LEPC developed a form for traffic watchers to fill in.

The form asked for the type of vehicle -- e.g., tank truck, non-tank truck -- and the placard number. They chose as the locations they would survey the eight main entrance points to the county (which includes the Kansas turnpike) as well as 7 other points within the county. They conducted the survey over 12 hours because they wanted to know peak times as well as the number of vehicles.

The LEPC members themselves took part in the survey and several volunteered the time of other people; for example, the sheriff volunteered his deputies; the Texaco representative brought a couple of his staff; and one member volunteered her mother. People took 4- to 6-hour shifts.

Using the LEPC members instead of an all-volunteer force helped involve the members in the process and gave them an investment in the plan. Once the survey was done, all the information was plotted on a large map to give the LEPC a picture of where the hazardous materials are and which are the major routes of concern for planning purposes.

Outreach. The public relations people on the LEPC persuaded the local newspaper to run articles on Title III and its significance to the public. The paper ran one major article and a couple of follow-up pieces later. The LEPC also ran spots on the radio. One LEPC member is a radio disk jockey so he was able to present the spots himself.

The LEPC members also spoke to the Secretaries' Club, the Lions, Kiwanis, and the Rotary Club to reach the local business community.

LESSONS LEARNED

Help Comes from Unexpected Places. One major lesson the Butler County LEPC learned, and the one for which it has received national publicity, is that help can be found in unexpected places. The LEPC hazards identification survey and emergency plan were developed by Allen Roe, an inmate at the state prison, who had been working as a file clerk in the county health office.

Roe estimates that he has Butler County, Kansas (cont.) now spent over 800 hours working on the plan, meeting with SERC staff to review the plan, and providing information and help to other counties. Roe urges counties to use inmates, if appropriate, and senior citizens. Not only do senior citizens have time, but they also are responsible and they know the county.

JEFFERSON COUNTY, KENTUCKY

LEPC Profile

LEPC: 200-plus members (including representatives of all facilities reporting)
Population: 675,000 (includes Louisville)
Facilities: 210 reporting facilities
Topics: Training, Planning, Funding, Information Management

In 1985, an accidental release of hexane resulted in an explosion that destroyed property above 2 1/2 miles of sewer lines. Following that incident, the county adopted an ordinance that required hazardous materials reporting and the development of emergency plans by facilities.

LEPC ACTIVITIES

Training. Partially as a result of the planning process that was begun following the sewer system accident, the county health department developed and delivered hazmat training for the Federal Agency for Toxic Substances and Disease

Registry {ATSDR), part of the U.S. Department of Health and Human Services. This hazmat training is focused on health department concerns (e.g., treatment of exposed people and equipment), but it also covers all other aspects of hazardous materials response. Many of the emergency services organizations within the county participate in this training process. The course is one week in length and is open to anyone interested. Health officials, planners, and first responders from various parts of the county have attended the training sessions.

Planning. As a result of the planning that followed the 1985 incident, fire departments in Jefferson County adopted FEMA's integrated emergency management system. Title III information is now integrated into the existing hazardous materials annex that was created initially under that plan.

The State of Kentucky has determined that all facilities subject to SARA reporting will be represented on LEPCs. As a result, in addition to county representatives, Jefferson County's LEPC has one member for each of the 210 reporting facilities. The number of initially affected facilities was 218, but 8 reduced inventories to avoid reporting requirements. At first the large number of members of the LEPC seemed unwieldy, but it has led to wide involvement in the planning process by industry. Most of the work is being done by subcommittees consisting of LEPC members.

Facilities have taken an active role in reducing hazards to the community, participating in the development of plans, and reducing and dividing inventories. For example, some facilities now break up stored hazardous substances into smaller containers. This reduces the overall hazard since the risk of all of the substance being involved in an accident is diminished. The overall relationship between the county and industry has been improved as a result of the legislation.

The county goes beyond the requirements of Title III by requiring the development of on-site and off-site plans by facilities. These plans are separate from the overall county plan. The on-site plans cover hazardous materials incidents that are completely contained within the facility fence-line.

The off-site plans include those incidents that pass beyond the boundaries of the facility. The facility must identify special populations and other sensitive locations nearby for inclusion in the plan. To assist facilities with these plans, the county prepared sample plans. The LEPC identifies the vulnerable zone for the facility using Computer Aided Management of Emergency Operations CAMEO system calculations based on the Technical Guidance for Hazards Analysis, a document jointly published by EPA, FEMA, and DOT.

The LEPC is broken into committees which individually are developing parts of the county's plan. The work of the committees is voted on by the full LEPC. The committees include the following: Health Issues and OSHA Regulations Committee, Community Emergency Planning Committee, Community Ordinance and Trade Secret Committee, and Information Committee.

Funding. The City of Louisville and Jefferson County each provided $25,000 and industry voluntarily provided another $50,000 for use by the LEPC information committee in undertaking public education about community right-to-know. Industry has contributed this money in the interest of providing the public with a full understanding of the information reported. Funding for other LEPC activities comes primarily from the city and county.

Information Management. Jefferson County is using CAMEO to assist with planning. The Office of Disaster and Emergency Services digitized a map of the county to put into the CAMEO system. In addition, on-site and off-site emergency plans that are required to be submitted by facilities will be included in the system.

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Calhoun County, Alabama; Pampa, Texas; State of Wisconsin; Cuyahoga County, Ohio; Racine County, Wisconsin; State of Idaho

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective.

The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations.

The bulletin's provide information on a variety of practices - for example, planning, compliance, information management, hazard analysis, and outreach.

The particular topics covered in each LEPC or SERC profile are listed at the upper right hand corner of the first page of the profile for easy reference.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

If you know of Title III implementation efforts that you feel would be of interest to others, please contact your EPA Regional Chemical Emergency Preparedness and Prevention coordinator (see list on the last page) or the Emergency Planning and Community Right-to-Know Information Hotline at 1-800-535-0202.

LEPC Profile

LEPC: 125 members (elected officials and representatives of all county law enforcement agencies, fire departments, medical, and emergency response units, military installations, facilities, and media; ex-officio chairman: county commission chairperson; working chairman; county emergency management agency director)

Population: 123,800

Facilities: 41, primarily textiles and apparel and primary and fabricated metals

Topics: Compliance, Funding, LEPC Organization

A Hazmat Task Force was in existence in Alabama prior to the passage of SARA Title III, although no state right-to-know legislation existed.

The Task Force was expanded by the Governor to form the Alabama SERC and each of the sixty-:seven counties was declared an LEPC. The Calhoun County Emergency Management Agency (CC EMA) in Anniston serves as the operations center for the Calhoun County LEPC, which has requested Tier II information from facilities.

LEPC ACTIVITIES

Compliance. To improve compliance with Title III requirements, CC EMA, the Alabama Department of Environmental Management, and the Alabama Emergency Management Agency conducted a pilot project with the assistance of US EPA Region IV during the winter of 1988-89 in Anniston, the seat of Calhoun County, Alabama.

The county was selected as a result of its economic diversity, which provided a wide variety of facilities, and the extensive experience of the CC EMA director.

The first phase of the project began in September, and the principal objectives were to identify and notify those facilities likely to be subject to sections 302, 311, and 312 of Title III which had not reported.

Regular meetings with the news media were arranged to intensify the outreach program through county newspapers, radio, and television.

A comprehensive database was developed, combining the information provided in the Dun and Bradstreet listings; the current CC EMA list of Title III reporting facilities; EPA Region IV' s list of water and RCRA permit-holders, and filers of the Toxic Release Inventory; county industry and business listings; the Anniston telephone directory; and local contacts and interviews.

Initially, the database contained approximately 250 entries, but it was reduced to 100 candidates for compliance following a series of interviews.

Arranged and coordinated by CC EMA, these conversations with civic officials and representatives of select industries sought to identify which county entities would be covered by Title III as a result of their use or storage of hazardous chemicals.

These interviews produced mixed results - the fire departments, despite limited training in chemical hazards response activity, proved to be a major source of information, but some industry representatives indicated they had little information to contribute about their competitors.

After review, 47 of these 100 entities were determined to be likely compliance candidates for the LEPC. These facilities were mailed a comprehensive package of Title III materials, including an explanatory cover letter, an EPA Title III Fact Sheet, a list of extremely hazardous substances, a flow chart on reporting hazardous material spills, and a list of Title III filing addresses.

The limited CC EMA budget prevented a certified mailing to insure the receipt of these materials, however, and only seventeen responses to this inquiry were received. One month later, non·respondents were sent a follow-up letter, asking them to review the Title III materials and indicate in writing whether they were subject to reporting requirements.

Although a few more responses were received in the following weeks, all of these were negative.

Phase two of the project was implemented in mid-February of 1989 with the assistance of EPA Region IV. Teams of government officials visited unresponsive facilities suspected of being covered by Title III.

These visits initiated a "get tough" program which produced the most significant results of the project - twelve entities with extremely hazardous substances and seventeen subject to sections 311-312 of Title III were identified and informed of their reporting obligations. Within several weeks, almost all of these had filed the appropriate reports. The LEPC is currently working to determine which identified facilities have failed to respond.

Funding. Funding for the Calhoun County LEPC and for the pilot outreach project is drawn from the budget of CC EMA. During the formation of the LEPC, CC EMA received donations from the Monsanto Corporation and the City of Anniston to purchase an IBM computer system; Monsanto also donated the time of an employee to provide word processing assistance. Aware of the financial burden of current regulations on county industry, the LEPC has not requested the establishment of a fee structure to provide for its funding. At the present time, however, the LEPC has only two employees, and the workload has prompted consideration of a fee system by the state legislature.

LEPC Organization. The Calhoun County LEPC is composed of approximately 125 individuals. An executive group of the chief elected officials, a business and industry subcommittee composed of all facility representatives, and seven task groups were established to perform LEPC, functions.

More effective and manageable than the entire LEPC, the smaller task groups are assigned responsibility for specific activities directly related to the knowledge and expertise of their members. Presided over by the acting LEPC chairperson, they have developed guidance documents, directed outreach efforts, and evaluated existing response resources for the LEPC.

LESSONS LEARNED

More Outreach Needed for Smaller Facilities. Prior to the Anniston project, a number of Calhoun County firms had filed submissions under sections, 302, 311, and 312 with the LEPC. As expected, these facilities were the largest in the county; the smaller firms appeared to lack comparable awareness and capacity to respond to Title III and thus require special attention in any compliance effort. Because of the dramatic increase in the number of reporting facilities described above, especially among smaller entities, the pilot project has been judged a success.

For example, an ice manufacturer who used 2300 lbs of ammonia in refrigeration had no knowledge of his obligations under Title III, but promptly filed under section 302 when informed by members of the project.

Developing a Facility Database is Important. Central to the success of this pilot project was the development of the database of organizations and firms likely to be subject to the provisions of Title III. Although holders of municipal and county licenses (a potentially more comprehensive listing) were not organized by SIC code in Alabama, the databases acquired proved to be a sufficient source of information. It should be noted that this project benefitted from the small, closely-knit nature of Calhoun County, where local officials and industry representatives know each other; the need for a comprehensive database is likely to be even greater in a larger, more industrialized area.

Coordinated Efforts at the Start. The success of the Calhoun County project illustrates the effectiveness of a combined effort by state and local Title III agencies. While Region IV staff did provide significant assistance in this project, these were exceptional circumstances because the project was designed to serve as a pilot for Alabama and potentially, for other states. It is likely, however, that the success of this project can be duplicated in other LEPCs, with SERCs or regional government agencies providing the database listings not available to local agencies and the enforcement clout necessary to reach recalcitrant facilities. At the present time, LEPCs across Alabama are taking part in a similar compliance program modeled on the Anniston outreach project. The Alabama SERC is providing local officials with guidance materials and lists of candidate facilities arranged by SIC code for their outreach efforts.

PAMPA, TEXAS

LEPC Profile

LEPC: Over 15 members including the city manager, police chief, health officer, Gray County Judge and Sheriff, and representatives from the city fire department, Texas Highway Patrol, Texas National Guard, American Red Cross, Santa Fe Railroad, industry, media, and citizens.

Population: 21,000

Facilities: 125 reporting facilities, including petrochemical refineries, and a carbon black production plant

Topics: Compliance, Training, Information Management

Pampa, Texas, first realized the need for planning for hazardous materials incidents and complying with other aspects of Title III as a result of participation in the Community Awareness and Emergency Response (CAER) program, which was organized by local industry. The CAER program served as a foundation for the development of the Title III program, coordinated jointly by the Pampa/Gray County Office of Emergency Management and the City of Pampa Fire Department. The city is relatively small in area, and the fire department cooperates with adjacent Gray and Roberts counties. The LEPC meets with members of industry reporting under Title III on a quarterly basis; these meetings are open to the public and the media; 40 to 50 people have attended on average. The LEPC has appointed an oversight committee which meets on a monthly basis to discuss current issues. This oversight committee designs the agenda for the quarterly LEPC meeting. The inclusion of the media in the process has resulted in a close working relationship between the media and the LEPC.

LEPC ACTIVITIES

Compliance. The Pampa Fire Department inspects all businesses within the city limits for fire hazards at least once per year. A hazardous materials specialist now accompanies the fire inspection officer on these inspections to assist with implementing Title III. During the course of an inspection, the specialist will survey the business to determine if any hazardous materials are on-site. If hazardous materials are found, the specialist will inform the owner or manager of the requirements of the Title III program. The manager is then offered assistance with meeting these requirements, including help with procedures, forms, and other paper work required of the facility; in addition, the representative will attempt to answer any questions that arise and may act as liaison: between the facility and the Texas Department of Health. Other assistance may include identifying where to obtain needed MSDSs and advice on storage and transportation of hazardous materials.

The surveys have resulted in increased awareness by the fire department and businesses of all hazardous materials that may be involved during fire-fighting operations, including materials that are not listed under Title III. The cooperative nature of the program has enhanced relations between industry and the fire department.

Training. Pampa doesn't have enough manpower to maintain a full-time hazardous materials response team, so the city relies on hazardous materials specialists who are matched to incidents as the need arises. In an emergency, the hazardous materials specialist works to identify the chemical, contain the spill, and notify the public. The fire department relies on the facility or state to handle the incident itself. A local facility has a hazmat team that responds to incidents throughout the Texas panhandle. To prepare for such an emergency, Pampa, Gray County and local industry, through the LEPC training subcommittee, conduct annual full-scale emergency exercises.

The LEPC training subcommittee agrees on a location for the exercise, as well as a scenario for an emergency or disaster. The subcommittee develops that scenario, coordinating with the appropriate agencies and industries.

Then, a table-top exercise is conducted and evaluated: Following the table-top exercise, a full-scale exercise is held. This allows industry and local responders to work together, not only through the planning process, but through the response process as well.

To train the hazardous materials specialists, the city took advantage of free training, including courses hosted by EPA, DOE, and the State of Texas. In addition, Pampa sought out other training opportunities. Knowing that Houston has an experienced hazmat team that sometimes responds to as many as three incidents per day, Pampa called the Houston Fire Department and asked if they could send someone to Houston on detail. Houston agreed, and, as a result, the Pampa hazmat specialists gained valuable hands-on experience for little cost. Pampa has also worked with the Santa Fe railroad, which brought in tank cars and personnel to talk about what to do and what not to do during railroad incidents.

Information Management. Pampa has acquired several computer software packages, which it has combined to create a menu-driven system to assist with management of information obtained under Title III. Most of the software was free.

- The city obtained a copy of CAMEO system from NOAA to aid with meeting the requirements of Title III. CAMEO contains a database of chemical information and may be used in response situations. CAMEO is also used by the LEPC to research chemicals for planning purposes.

- Pampa acquired a copy of Management Information of Title III (MITT), a system developed by EPA Region VI, to help individual facilities manage Title Ill information; the system has been adapted for use by the LEPC, The city uses Fyre Eyte, a software program that maintains records of fireman training and special skills; it assists with matching specialists to situations.
- The LEPC uses a desktop publishing package to maintain sketches of each facility including locations of all hazardous materials.

The city is attempting to acquire a portable computer and modem for use in the field, but, in the meantime, information is communicated via two-way radio.

LESSONS LEARNED

Assisting Industry Pays Off. Lasting and trusting friendships between the fire department and industry have developed. This relationship led to quick joint response during the Hoechst/Celanese explosion of November 1987, and resulted in substantial savings of lives, property, and time.

WISCONSIN

SERC Profile

State Characteristics: 72 counties are LEPDs

SERC: 14 members, representing state agencies, fire fighters, law ·enforcement, county and municipal governments, labor, environmentalists, and industry; chair: Administrator, State Division of Emergency Government

Topics: Funding, Compliance, Outreach

The State of Wisconsin has taken an active role in helping its LEPCs to implement Title Ill by providing funding and outreach programs as well as compliance procedures.

SERC ACTIVITIES

Funding. In the first year of its Title III implementation, Wisconsin appropriated $96,000 from general revenues to initiate its program. After estimating that the costs for LEPCs would be ten times that amount, the state legislature adopted a fee system to support both the SERC and LEPCs. Wisconsin has adopted the following schedule of fees to pay for Title III programs:

- A one-time fee of $800 for filing the notification required under SARA section 302 and state law.
- Annual fees based on the number of chemicals a facility reports on the section 312 hazardous chemical inventory form:
  - $100 for 1 to 100 chemicals;
  - $150 for 101 to 500 chemicals: and
  - $300 for more than 500 chemicals.

Funds are used to administer the state program and are made available to LEPCs for emergency planning grants. The State law requires that plan preparation be the first priority for use of grant funds. The grants, however, may pay for up to 50 percent of the cost of computers or response equipment, up to a maximum $6,000 for each. State law prohibits local governments from adopting fees of their own to fund the program. The State awarded grants totaling almost $380,000 to LEPCs for 1988. Initial payments on these grants totaling over $284,000 were made just before Christmas in 1988.

Compliance. The SERC is in the process of adopting formal compliance and enforcement procedures. If an LEPC or an individual citizen notifies the SERC that a facility is not complying, a form letter will be sent to the facility notifying it of the complaint and the Title III requirements. The LEPC will receive a copy of the letter and will be asked to contact the facility. If the facility fails to respond within a specific time, the case will be referred to the state for prosecution.

Outreach. The SERC sends regular Information and Guidance Memos to all LEPCs to keep them up-to-date on Title III issues. The
SERC has established procedures for LEPCs to apply for the planning grants. To help the LEPCs with their planning and outreach, the SERC obtained a printout from the Wisconsin Industry, Labor, and Human Relations Agency that provides the name of every business for the state, organized by county and SIC codes.

LESSONS LEARNED

Draft Your Laws Carefully. The SERC advises other states and local governments to be careful how they draft their Title III-related statutes. The Wisconsin law requires every facility with ten or more fulltime equivalent employees to pay the fees. Although the intent was to exempt small facility businesses, the law has allowed some unexpected exemptions. Many large companies keep their extremely hazardous substances in facilities where they have very few employees. As a consequence, because the law says "facilities" not "employers," 30 to 50 percent of the facilities that were expected to be covered by the fee system are now claiming to be exempt.

CUYAHOGA COUNTY, OHIO

LEPC Profile

22 members (covers 59 political subdivisions; subcommittees open to all interested parties)
Population:· Approximately 1,500,000 (includes Cleveland)
Facilities: Approximately 650 total, 250 subject to section 302
Topics: Hazards Analysis, Planning, Outreach

The Cuyahoga County LEPC covers 59 political subdivisions, including the City of Cleveland. The LEPC decided that if it was to obtain consistent, high quality information from all facilities subject to section 302 in its planning district, it needed to take an active approach.

LEPC ACTIVITIES

Hazards Analysis. The LEPC decided that the best method of ensuring that it received adequate information from the facilities covered by SARA section 302 was to conduct a survey of firms expected to be subject to the requirements of Title III. The LE.PC developed an initial list of facilities to survey from those who had submitted a section 302 notification, those who identified facility emergency coordinators, and those who submitted Tier II forms. The survey was mailed in April 1988. At the same time, they sent each fire chief in the county the questionnaire. The fire chiefs were asked to visit each facility and go through the questionnaire with facility staff to gather the needed information. The questionnaire covered the transportation of extremely hazardous substances (e.g., how they are transported, shipment size, type of carrier, and unloading system), alert systems, training, emergency equipment, and prevention equipment. Each facility's emergency coordinator was also asked to determine zones of vulnerability for each section 302 substance it reported.

The fire department was provided with a summary of the "Technical Guidance for Hazards Analysis" and was asked to assist the facility's emergency coordinator with the determination of the vulnerability zones. Facilities were encouraged to use their own methodology if they wished. Finally, the largest zone found from among all chemicals at each facility was drawn on a U.S. Geographical Service map to illustrate the area that might be affected in a worst case release of a section 302 substance. The interview process benefited both the facility and fire department. The fire department gained more emergency preparedness information than it previously had and established contacts within each facility. The facilities benefited because they became acquainted with the people who would have to respond to an emergency. Overall, the LEPC Sees this cooperation and information exchange as a major benefit of the process.

Planning. The LEPC has used the information gathered from the survey to develop its plan and will continue this interview process as it identifies additional facilities subject to section 302 requirements. It plans to conduct a small number of detailed follow-up interviews with facilities surveyed in 1988 as a first step in developing a more thorough analysis of each facility. The questionnaire also served as a way to gather information for the county's emergency response resources inventory. Each facility provided information regarding equipment and expertise it would be willing to share with the community in the event of an emergency incident. Fire department equipment and supplies information was also gathered as part of the process. This information has been added to the Cuyahoga Emergency Resources System (CERS) Reference Manual, which includes reference material for all types of emergencies.

Outreach. The LEPC distributed a set of guidelines on how to report an emergency release of an extremely hazardous substance or CERCLA hazardous substance in Cuyahoga County. The guidelines, published as a brochure, divide releases into three groups: releases discovered by a transporter; releases discovered by a third party; and releases discovered by a facility. For each, the brochure provides a flow diagram to show who gets contacted by whom and when. The guidelines, which include a list of reportable quantities of SARA section 304 substances, were distributed to each facility's emergency coordinator, to mayors, and to public safety professionals throughout the county. The guidelines were recommended by the LEPC's Emergency Notification Subcommittee and costs for layout and printing were underwritten by a private company, BP America.

LESSONS LEARNED

Familiarity Breeds Cooperation. Cuyahoga County has complex inter-jurisdictional issues to address with regard to emergency planning efforts. In addition, it has a large number of facilities to consider. From the beginning, the county has focused on inter-jurisdictional cooperation to encourage improved emergency response capabilities. The LEPC, in addition to managing the administrative requirements of Title III, has made a commitment to providing a service to facilities, to public safety forces, and to the public. This has resulted in significant contributions by most everyone involved in the process.

RACINE COUNTY, WISCONSIN

LEPC Profile

LEPC: 15 Members (emergency management, industry, environment, deputy city attorney, health department, EMS, Red Cross, elected official, police, sheriff, fire, business groups, media, civic organizations)

Population: 173,000 (including City of Racine)

Facilities: 74 facilities subject to section 302; 526 facilities reporting under sections 311 and 3.12 (expected agricultural facilities: 100+)

Topics: Outreach, Compliance, Training, Planning, Information Management

Racine County in southeastern Wisconsin is just south of Milwaukee and borders on Lake Michigan.

The county followed the development of Title III as the Superfund Amendments and Reauthorization Act (SARA) was being debated in Congress.

The county met with industry during the development of the legislation so that both would be prepared to start working together if the legislation was enacted.

As a consequence, the county was familiar with the provisions of Title III and ready to start planning as soon as the legislation was signed.

LEPC ACTIVITIES

Outreach. When the LEPC first received a list of potentially covered facilities from the SERC, the LEPC realized that the list included many facilities that were unlikely to be covered under SARA section 302 requirements.

The problem arose because a number of facilities had notified the SERC that they were covered based on a misunderstanding of Title III requirements.

In addition, a number of facilities known to have extremely hazardous substances above the TPQ were missing from the SERC list.

Only a few agricultural sites had reported yet the indications were that a hundred or so farms would be covered under the reporting requirements of section 302.

To begin to handle these problems, the industry members on the LEPC ran a series of programs for businesses to explain Title III and to identify which facilities are covered.

For the agricultural community, the LEPC felt it needed to do more.

The section 302 list of chemicals is not readily translated into the kind of information farmers can use because the chemicals are listed by generic names used by chemists, not by the names recognized by farmers on product labels.

A group of LEPC members looked up every section 302 chemical.

They identified 66 chemicals that are used in agricultural products and cross-referenced them to over 1,000 trade name products.

This cross reference list was then taken to the agricultural dealers in the county who identified those products used locally by the farm community.

From this second list, calculations were made with information supplied by the agricultural distributors on how much of each product a farmer would need on site to fall within the reporting requirements.

Posters with this information were printed up and distributed throughout the county as was a "compliance station," which included cards and mailing labels that could be used by the farm community to report to the SERC and name a facility coordinator to the LEPC.

Compliance. As part of the City of Racine, Wisconsin, program for ascertaining compliance with Title III, a variety of small businesses were inspected.

Besides identifying facilities not in compliance with Title Ill, the results of these inspections were unexpected.

Major safety violations were identified in the inspections and, in fact, one facility had to be immediately evacuated because of the imminent potential for a serious chemical accident.

All of these facilities' inadequate safety practices escaped detection despite obtaining building permits, insurance and bank loans, and meeting fire codes.

The managers of these small businesses all claimed to be running safe operations.

A good number of these facilities have fallen outside of the loop, claiming never to have heard of Title III and OSHA's Hazard Communication Standard.

Their facilities have been inspected by the fire department and issued building permits with no mention of their safety practices or lack thereof.

Training. The medical subcommittee raised the question of what would happen if members of the hazmat team were hurt or contaminated during an incident.

To explore the question, the county held an exercise, the results of which indicated that they were not prepared to deal with this problem.

Further, the medical community was not prepared to handle the problems of contamination control with the ambulance fleet and the hospital emergency department.

In cooperation with St. Mary's Medical Center of Racine, the emergency medical services section of the Wisconsin Division of Health, the coordinator of the Emergency Government Office, and others used funds obtained under the section 305 grants to develop two eight-hour courses, one for emergency medical technicians and one for hospital emergency room staff, to teach them how to deal with contaminated victims of a hazmat incident.

These programs have been conducted throughout the State with more than 20 offerings scheduled for 1989.

Planning. The LEPC has focused on the community consequences of an incident.

Areas being investigated include establishing emergency day care centers to care for the children of emergency workers.

Many families were found to have both spouses employed in emergency response or care elements within the community.

These people could not fully respond to deal with an emergency because of family commitments.

The LEPC has also considered the provision of emergency medical care in shelters to the chronically ill who may have left vital medications at home.

The LEPC is looking into preservation and retrieval of critical records needed in an emergency such as nursing home charts, pharmacy prescription records, and medical charts from areas impacted by a chemical incident.

Information Management. The LEPC is using CAMEO to manage all the data for the county and to take the burden off local fire departments.

The CAMEO information has been loaded into a Macintosh II computer set up as a file server and is linked to several fire departments using 9600 baud modems and Timbuckto Remote software, which allows multiple users to view the information being called from the system.

The LEPC is exploring the transmission of data over high speed radio systems to provide greater flexibility for field use.

The LEPC has used CAMEO to prepare response plans for 58 facilities; the plans have been submitted to the SERC for its approval.

LESSONS LEARNED

Everyone Has To Work. One key to the LEPC's success has been that everyone on the LEPC has a defined function and everyone has worked hard at their assigned tasks.

When routine jobs such as stuffing envelopes have to be done, several LEPC members groups can rally civic groups to get the job done in a timely manner.

Business and industry members assisted with mailings and handled follow-up information and requests.

Civic groups and the media helped with public presentation and gave their time and talents at regular LEPC meetings and functions.

This involvement makes everyone feel that they have a role to play and provides a sense of purpose to the process.

Involve Non-LEPC Experts. The LEPC's subcommittees have not restricted their membership to LEPC appointees.

Instead, they have opened the subcommittees to interested people and have actively sought out people with relevant expertise.

For example, they have drafted a retired chemist to work with them on issues such as the chemical list for farmers and used high school students to design posters.

By adding non-LEPC members to the subcommittees, the LEPC has been able to expand their knowledge base significantly.

Get to Know the Big Picture. Critical to the success of the program has been the importance the LEPC has placed on understanding the differing views of SARA held by the players.

By working together industries and business have learned' the concerns of emergency responders and vice versa.

Differences in views and opinions were found to be minimal once discussion and communication lines were opened up to participants on all levels of the program.

IDAHO

SERC Profile

State characteristics: 6 Local Emergency Planning Districts

SERC: 10 members (6 State agency directors, 2 local representatives, 1 state-based facility representative, and an Idaho Mining Association representative; chair: Mining Association representative)

Topics: Planning, Outreach, Compliance, Training, Information Management

One of the first questions Idaho had to face was how to divide the State into planning districts.

One option, to set up one LEPC for each of the 44 counties, was eventually rejected because some counties are very sparsely populated - one has only about 600 residents and one paid public official, the sheriff.

The State chose instead to piggyback on the districts that the law enforcement and transportation departments use.

SERC ACTIVITIES

Planning. The division of the State into six planning districts led to some identity crises over what exactly was the county versus the LEPC role.

The SERC has solved some of those problems by having each county do a plan as an annex to existing emergency plans and using the LEPCs as coordinating bodies.

The LEPCs have become forums for training local officials and responders and for information sharing and mutual aid.

Counties that were reluctant have been educated about the State's emergency management system and are learning how planning for a hazmat incident enhances their multi-hazard emergency plan.

Outreach. The SERC has been going out, county by county when asked, to provide as much face-to-face help (e.g., training) as possible.

A temporary research/planning position has been created to provide direct assistance to counties on hazard/vulnerability analysis.

EPA and FEMA regional offices have also participated in some of these meetings with the LEPCs and counties.

The SERC has prepared a brochure of general information on Title III for the public and did a large scale mailing.

Compliance. The SERC mailed an 8-page brochure with State-specific compliance information to pesticide dealers and applicators, extension agencies, all local Chambers of Commerce, all hazardous waste generators, air permit holders, National Pollution Discharge Elimination System (NPDES) permit holders, local governments, OSHA inspectors, the association of industrial hygienists, and all waste water treatment plants.

SERC staff have conducted several compliance workshops for trade associations.

A series of 12 workshops were held, in the summer of 1989. These were open to any business, industry, or individual interested.

These outreach efforts reflect the policy of the SERC that the most efficient, effective, and economical compliance strategy is educating the regulated community.

Training. The SERC sent three people to FEMA's Emergency Management Institute for the "train the trainer" course in Hazardous Materials Contingency Planning (a joint EPA/FEMA/DOT course).

That course was delivered to each LEPC with the help of EPA, FEMA, and an experienced fire chief.

A cadre of 60 new trainers have now been certified and have trained over 700 people on recognition and identification of hazards and on hazardous material incident analysis.

Another 35 instructors have been trained in "Hazardous Materials: The Pesticide Challenge."

These "train the trainer" courses have been extremely successful.

The SERC has focused its training efforts on non-fire department personnel - for example, industry and police - because the fire departments already have access to training.

Information Management. The SERC has decided to handle all the data submitted.

The information from the section 312 Tier II forms is being entered into the Idaho Department of Transportation's mainframe computer because it has terminals at a minimum of two points in each county so the data can be retrieved locally.

LESSONS LEARNED

Title III Is Positive. The SERC believes that the Title III process has done a tremendous amount of good.

The industry people who initially participated in LEPCs strictly out of self-interest have dropped out of the LEPCs or expanded their views and those who remained have developed a new rapport with the government officials.

The SERC sees a new level of openness and mutual understanding between government and industry that is allowing them to work together to prevent accidents.

Non-government Chair Can Help. The SERC chair is the representative of the Idaho Mining Association, the state-level mining trade association.

Because the person is outside the State government, he has been able to guide the SERC without being involved in interdepartmental conflicts.

EPA OSWER 89-006.3, December, 1989, Series 6, No. 3

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Woodbury County, Iowa; State of Virginia; Fairfax County, Virginia; Pierce County, Washington

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LE.PCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices -- for example, planning, compliance, information management, hazard analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed at the upper right hand comer of the first page of the profile for easy reference.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation.

WOODBURY COUNTY, IOWA

LEPC Profile

LEPC: 60 members representing 48 entities, including civil defense, police, fire, hospitals, ambulances, funeral directors, American Red Cross, Salvation Army, ham radio operators, media (print, radio and television), and industry

Population: 100,000

Facilities: 140, including 40 which reported for section 302 farm chemical manufacturers and distributors as well as some warehouses that handled over one million pounds of hazardous chemicals a week were among the section 302 reporters

Topics: Compliance, Funding, LEPC Organization

Woodbury County, Iowa, is a mostly agricultural community bordering Nebraska and South Dakota. Sioux City is its only urban area.

On July 19, 1989, United Air Lines Flight 232 was forced to attempt an emergency landing at the Sioux City airport while en route from Denver to Chicago. The plane's entire hydraulic system had been destroyed and the plane was virtually uncontrollable.

If it was not for the heroic efforts of the pilots and the quick response of the emergency response personnel on the ground at Sioux City, there would not have been over 180 survivors from a plane that had cartwheeled across a runway and exploded into a great ball of flames.

The response at Sioux City would not have been as quick and coordinated had it not been for the teamwork developed through the establishment of a disaster committee long before this tragedy.

This disaster committee includes all elements of the community that have a role to play in any emergency. After the passage of Title III, this disaster committee incorporated into its charter all the functions and the mission of a local emergency planning committee.

LEPC ACTIVITIES

Formation of the LEPC. The disaster committee was formed as a result of a continuing series of emergency simulation exercises held within the county.

These exercises were originally conducted to fulfill State obligations for the local hospitals to maintain certification and for the local civil defense agency to conduct an emergency exercise every five years.

Faced with these obligations and understanding the need to be prepared for any emergency, the county chose to conduct a full-scale emergency exercise every year. Initially, representatives from civil defense, fire, police, hospitals, and ambulatory services would meet only to design and conduct the yearly exercise.

Based on evaluations of these exercises, the representatives determined it was important to meet to discuss emergency preparedness and response issues beyond conducting exercises. These groups agreed to meet on a monthly basis.

After the passage of Title III, the State assigned the county the task of developing an LEPC.

The county recognized the disaster committee as the most appropriate vehicle for establishing the LEPC. However, because the disaster committee was composed of a limited group of community organizations, representatives of other elements of the community were added to achieve the broad-based participation required by Title Ill.

These other elements included elected officials and representatives of industry, funeral directors, ham radio operators, and the media.

These new members have valuable and varied experiences and expertise to offer, especially the industry representatives.

Funeral directors were able to help the county address the issue of handling mass fatalities in an emergency situation (for example, in the crash-of Flight 232). The addition of elected officials helped elevate the profile of the disaster committee within the community.

Emergency Exercises. The county utilizes a well-developed and organized emergency exercise program to continually improve its coordination and communication skills. In 1987, the county conducted an exercise based on the scenario of a major plane crash at the Sioux City airport.

The next year, 1988, the exercise scenario was a train with hazardous materials colliding with a school bus. These exercises provide the county with an excellent opportunity to test their response system and improve the coordination and cooperation of all elements of the community that would be involved in such a response.

The emphasis of these exercises is on improving communications during crises.

One result of this emphasis on communications has been the formation of a communications subcommittee, which is exploring ways to improve the county's emergency communication and broadcast systems.

This subcommittee is also developing a mobile command post for the county.

The base for this command post is a 40-foot trailer donated by a facility. A union local has donated labor, while the remaining funding for this project will also come from donations.

Outreach. The county has employed all of the local media -- print, radio, and television -- in providing facilities and the general public with information on Title Ill, through articles and public service announcements.

The local hospital sponsored a free luncheon for 30-40 businesses in which a panel of civil defense, police, fire, Red Cross, and other officials discussed the Title III requirements.

The panel members provided assistance to these businesses in complying with the regulations and developing emergency plans.

The hospital, in association with the disaster committee, is planning another luncheon this fall for school officials and, then, next spring, for businesses in neighboring communities, including out-of-State communities that border the county.

Inter-County Coordination. The county is coordinating its planning and response activities closely with the neighboring communities. Woodbury County shares borders with four counties in Iowa and two States, Nebraska and South Dakota. With all counties having limited resources, better coordination and sharing of resources are needed for comprehensive responses to crisis situations. Woodbury County plans to move aggressively in expanding the tri-State preparedness activities.

The county recently contracted with Siouxland Interstate Metropolitan Planning Council (SIMPCO), a regional planning authority, to review all county plans to ensure that the county's plan parallels the plans of neighboring communities that have contracted with SIMPCO.

Following improved coordination among neighboring communities, the county would like to see the creation of a regional hazardous materials response team. This team would not only be designed to better utilize limited resources for the entire tri-State area, but it could also assist in planning and conduct training for first-responders throughout the area. However, because of limited funds, the counties of the tri-State area cannot establish such a team at this time.

LESSONS LEARNED

Teamwork is Essential. The county believes they were prepared for the crash of Flight 232 because of the dedication and determination of a group of individuals to work together as a team to prepare for the worst. The county had the commitment and active support of many members of the community, including elected officials, industry, and even funeral directors.

This positive spirit of teamwork was especially apparent on the part of industry facilities. In response to the plane crash, industry representatives on the disaster committee offered and provided clerical and support staff, technical information, and an airplane hanger for the storing of the passengers' personal effects gathered from the plane wreckage. Through the working relationships developed within the disaster committee, this assistance was efficiently and quickly coordinated and provided.

Know All the Title Ill Players. While most LEPCs have limited resources and financial support from Federal and State sources, the county believes it is still vitally important for the LEPC to get to know all the Title III players, especially at the Federal and State level. LEPCs should learn to work with their State and Federal counterparts for two reasons: 1) to identify any available resources the State and Federal officials may have to offer including guidance, training, and technical assistance; and 2) to create a working relationship with these officials, which will be extremely helpful in an emergency situation. Now is the time to learn to work together, not after a DC-10 crashes in your community.

STATE OF VIRGINIA

State Profile

State Characteristics: 114 Local Emergency Planning Districts, including 73 counties, 18 cities, 2 towns with populations of 5,000 or more and 21 joint districts

SERC Membership: Eight State agencies, including the Department of Waste Management (Chair); Water Control Board; and the Departments of Emergency Services, Air Pollution Control, Fire Programs, Health, Labor and Industry, and State Police

Tropic: Training, Outreach, Liability, Information Management, Use of Section 313 Data

Virginia has been one of the most active States in implementing Title III. It has provided training for its LEPCs and affected facilities to help both in understanding their roles in the Title III process. Its SERC, the Virginia Emergency Response Council (VERC), has been assigned the responsibility of providing guidance and training to each community to assist in developing a chemical emergency planning and preparedness program that meets each community's specific needs.

SERC ACTIVITIES

Training. The VERC has been very active in providing training and technical assistance to its LEPCs and the regulated community. The VERC has sponsored and presented numerous training seminars for LEPCs, other local government officials, and industry at locations throughout the State.

The five-day ''Hazardous Materials Contingency Planning Course," developed by FEMA, EPA, and DOT, has been offered eight times in Virginia. Virginia, like many other States, has sent personnel to be trained as trainers for this course. For industry in Virginia, the VERC presented 10 seminars that provided a general, but thorough, overview of all Title III requirements. The VERC also sponsored eight seminars that specifically addressed the section 313 toxic chemical release reporting requirements.

Outreach. In supporting its LEPCs, the VERC has developed many outreach materials that have helped the LEPCs recognize their responsibilities as well as provided concrete assistance in fulfilling those responsibilities. For example, the VERC published a guidance document for its LEPCs to use in establishing procedures for handling requests for Title III information from the public. The VERC also produced a training video entitled, "Preparing for Chemical Emergencies." This video gives LEPCs a general overview of their roles and responsibilities under Title III and suggests how to prepare for chemical emergencies without Federal or State funding.

The VERC maintains regular communications with all its LEPCs and acts as a conduit for any relevant guidance, training, and technical assistance offered by the Federal government. As part of the VERC's commitment to keeping its LEPCs informed, the VERC provides each LEPC with copies of any EPA guidance or outreach document within one week after it becomes available to VERC.

The VERC believes that the success of Title III· depends on an effective outreach campaign to inform industry of its responsibilities and citizens of the information available to them on chemical hazards in their community. One of its first products was a series of advisories for facilities on each of the Title III requirements and deadlines. These advisories were sent to over 5,000 facilities identified as potentially subject to the requirements. These advisories served a dual purpose: they provided industry with information on complying with Title III requirements and informed the LEPCs, who received copies of these advisories, that they would be the recipients of this information.

Liability. One of the first concerns LEPCs raised in the early days of Title III was LEPC members' liability in planning for and responding to a chemical emergency. The VERC sought the advice of the Virginia Attorney General's office, which concluded that the LEPC members are agents of the SERC. Based on this opinion, the VERC obtained a commitment from the Virginia Division of Risk Management to provide insurance coverage for all LEPC members for any claim made against them for any acts, errors, or omissions that occur in the course of their authorized governmental duties.

Information Management. In order to manage the significant amount of Title III information more effectively and make it more accessible to the LEPCs, the VERC developed an information management system that allows for systematic retrieval of the thousands of facility reports submitted. Title III information is currently available to the LEPCs upon request to the VERC. However, the VERC plans to makes this information management system accessible to any LEPC with modem capabilities.

The computerized information management system used by the VERC for storing the Title III information and developing its planning initiatives is the Emergency Information System/Chemical (EIS/C) software. EIS/C is run on an IBM-compatible computer and records chemical, facility, transportation, and other planning and response information. This information is graphically displayed on color maps. The EIS/C system also stores the MSDS and Tier I and II information for the VERC.

The VERC has also purchased the Occupational Health Services' (OHS) MSDS ON DISC software, which provides generic chemical information on over 9,800 hazardous chemicals. As the recipient of the section 313 toxic chemical release reporting submissions, the VERC has input these facility reports on a database to provide citizens ready access to information on annual releases of toxic chemicals to all environmental media from facilities within the State. The public can write or call to request a hardcopy of any available facility report. Section 313 data also can be obtained on disk upon request.

Use of Section 313 Data. In November 1989, the VERC developed a report for the Governor that evaluates the section 313 data submissions for calendar years 1987 and 1988. The report focuses on how much facilities in Virginia reduced their emissions from 1987 to 1988. The VERC believes this report shows that most facilities have strived to reduce their releases following their reporting for calendar year 1987.

LESSONS LEARNED

LEPC Role Goes Beyond Planning. The VERC believes that the role of the LEPC, in keeping with the spirit and intent of Title III, goes far beyond the preparation of an emergency plan. The LEPC is the front-line for all planning, preparedness, and prevention activities because of its relationship with the community. More and more, citizens are looking to the LEPC to provide answers concerning health effects of hazardous and toxic chemicals, waste reduction, chemical process safety, and emission reduction.

As a recipient of most of the Title III information, the LEPC has a vital role to play in addressing these concerns. As preparedness and response groups, the LEPCs have an inherent responsibility to protect the health and environment of their community. The LEPC provides an excellent vehicle for providing information to the community, particularly industry, on how to identify chemical hazards and safely deal with them. The VERC believes the section 313 data are a very useful tool for expanding the capabilities of the LEPC; more local governments should use the data.

Develop Generic Chemical Hazard Data. The VERC found using generic information on chemical hazards -- for example, the MSDS ON DISC database -- more useful and effective than searching through the numerous filing cabinets that contain all the MSDS submissions received under section 311.

Besides the easier access to the information, the VERC found that the information on this computerized and updated database was more thorough and informative than sifting through duplicative MSDSs, which sometimes contain conflicting, outdated, or inaccurate data. However, recognizing that the MSDS ON DISC did not include all hazardous chemicals, the VERC reviewed its copies of MSDSs and entered all those MSDSs that were not in the computerized database.

Computers Are Good Planning Tools. Computers can be useful and efficient tools in the planning process. Hazard analysis and plan revisions can be accomplished quickly and accurately. Computers can significantly reduce the paper burdens associated with planning and allow for greater and more effective manipulation of the data for planning as well as response.

FAIRFAX COUNTY, VIRGINIA

LEPC Profile

LEPC: 30 members, including elected officials and representatives of county and city law enforcement; count fire department; county environmental, planning, health, and transportation agencies; public interest groups; hospitals; media; public utilities; industry; and citizens

Population: 750,000

Facilities: 286 reporting facilities, including gas stations, pesticide distributors, county waste water and drinking water treatment plants, a printing ink manufacturer, and a large metal finishing plant

Topics: Use of Section 313 Data, Compliance, Planning, Information Management, Outreach, Funding

Fairfax County is part of the greater Washington, DC, metropolitan area. The county includes several major highways which transport many hazardous chemicals.

Its LEPC, which has been organized since late 1987, holds monthly meetings which are always open to the public.

The Fairfax County Fire and Rescue Department, a member of the LEPC, is one of the largest and best equipped fire departments for handling hazardous chemical emergencies in the Mid-Atlantic states.

LEPC ACTIVITIES

Use of Section 313 Data. In order to improve facility compliance with all Title III requirements, the LEPC has obtained the 1987 and 1988 toxic release Form R submissions for its jurisdictions from the Title III Reporting Center, and compared those submissions with the list of facilities that submitted Tier II forms (requested by the county for section 312 reporting).

Based on this comparison, the LEPC determined that all facilities that reported for section 313 also reported for sections 311-312.

The LEPC now has direct computer access to the section 313 data using the county fire department's hazardous materials response vehicle link to TOXNET (see the Information Management section).

Compliance. In addition to using the section 313 information to assess compliance, the LEPC checks the list of facilities that report releases under section 304 to determine if these facilities had reported under sections 311-312. The LEPC is also conducting a survey of all businesses and apartment buildings to identify facilities that are subject to the Title III requirements.

The survey identifies hazardous chemicals these facilities may have present on site (for example, chlorine for swimming pools) and determines what fire prevention equipment, if any, they have available.

A local ordinance requires any facility handling hazardous materials to obtain a fire prevention permit before starting operation. The county has established permitting procedures that require the fire department to inspect each facility before issuing the permit.

Access to information supplied in response to permit requirements allows the LEPC to identify new facilities subject to Title III compliance.

Planning. As part of the LEPC's planning process, any facility that submitted a Tier IT form for an extremely hazardous substance is identified as a critical hazard facility.

The LEPC requests that the critical hazard facility submit a facility response plan, facility maps with locations of all hazardous materials, and information on the facility's release detection equipment and practices.

The LEPC requests the information using its authority under section 303(d)(3) of Title III, which allows the LEPC to request any information relevant to emergency planning. Using this information, the LEPC annually updates their emergency response plan.

Information Management. Currently, the LEPC has one fully equipped hazardous materials response unit for responding to chemical emergencies.

The hazmat unit uses the Harwell chemical database for chemical hazard information and protective clothing recommendations.

This database is specifically designed to provide this information for the initial response to a hazardous material situation before detailed information on the extent and cause of the accident is identified.

The hazmat unit also subscribes to HAZARDLINE database, which provides on-line response and medical effects information on hazardous substances, and TOXNET, which provides on-line toxicological information on hazardous substances, as well as the section 313 toxic release inventory.

The hazmat unit is equipped with these multiple sources on chemical hazard information because their response procedures require that information used in incident decision-making be verified by three sources.

The hazmat vehicle has a cellular telephone modem, which allows the response personnel, while en route to the incident, to access Tier II information, especially storage locations and chemical hazard data, from the database maintained at the station.

The vehicle is equipped with an IBM PS/2 Model 30 personal computer. Using the modem, HAZARDLINE and TOXNET on-line databases can be accessed from the hazmat vehicle.

At present, the facility maps cannot be adequately accessed. However, the hazmat unit is planning to obtain equipment necessary to transmit the maps and allow for plume modelling with the on-board computer.

In the future, an IBM PS/2 Model 80 personal computer located at the station will store the Title III submission information on dBase (a software package for database management).

Data for planning and response activities -- for example, storage, facility, and transportation locations -- will be stored on this computer using the Emergency Information System/Chemical (EIS/C) software package. EIS/C records chemical, facility, transportation, and other planning and response information.

The EIS/C system also stores the MSDS and Tier I and II information.

Use of EIS/C also allows the LEPC to develop facility maps and conduct hazard analyses.

At present, this information is only available for response personnel serving on the hazmat unit. However, the LEPC plans to make all information collected under Title III available via computer to all fire stations within the LEPC's jurisdiction.

Outreach. Through the cooperation of the area's media, the LEPC has been able to communicate their Title III messages to the public and potentially covered facilities. In particular, shortly after the LEPC was formed, a series of articles on Title III, planning for chemical emergencies, and response procedures and equipment was published in the local suburban newspaper.

Announcements of all LEPC meetings have also been published. The LEPC developed a brochure to explain the Title III requirements, the roles of the LEPC, and how the public can access the Title III information.

Fairfax Hospital and Washington Gas and Light printed a short, straightforward brochure for citizens.

Funding. Effective with calendar year 1988 reporting for Title III, the Fairfax County Fire and Rescue Department has been assessing fees based on their fire prevention code fee schedule.

A one dollar per page fee is charged for all Title III submissions including MSDSs, facility plans, and Tier II forms.

LESSONS LEARNED

LEPC Serves as Focal Point for Hazardous Materials Issues. The LEPC's active role in publicizing its activities and responsibilities under Title III has fostered an additional role as the focal point for the community on hazardous materials issues.

Citizens now look to the LEPC for answers to their concerns about particular chemical hazards in their community.

In addition, citizens look to the LEPC, and its regular public meetings, as a forum for expressing these same concerns.

Information Is Not A Paper Burden. The LEPC members have learned that the Title III information is not a part of some burdensome paper exercise with no usefulness for responding to a chemical emergency.

In fact, LEPC members now believe that the Title III data are very useful; if managed thoughtfully, in helping their community to better prepare for a chemical emergency.

Cooperative Attitudes Breed Cooperative Relationships. The LEPC members' experiences with facilities show that most facilities understand the objectives of the LEPC and are more than willing to help.

Most companies realize that the LEPCs need this information even though it may be burdensome to their facilities.

Cooperation goes a long way in developing a relationship which may be beneficial to the LEPC (access to technical resources and equipment) and the facility (better publicity and community relations.)

The LEPC has found that it is better to seek the cooperation of industry in meeting the intent and spirit of Title III rather than to demand industry's participation in an adversarial manner.

PIERCE COUNTY, WASHINGTON

LEPC Profile

LEPC: 37 members, including the county executive, representatives of city mayors, two State Representatives, and representatives of the county emergency management and health departments, the fire marshal, local fire districts, police, hospitals, the American Red Cross/Salvation Army, local military bases, the Sierra Club, Safety Council, citizens, media, Port of Tacoma, railroads, hazardous waste clean-up contractors, and industry. In addition, many organizations do not regularly attend LEPC meetings but are on the LEPC mailing list and contribute resources or expertise in some LEPC efforts. These organizations include labor unions, other neighboring LEPCs, universities, local libraries, and the Puget Sound Air Pollution Control Agency.

Population: 500,000, including the city of Tacoma

Facilities: 96 companies or agencies have reported on 256 facilities throughout the county. The majority of these facilities are associated with the Port of Tacoma, including major chemical manufacturing and transportation companies.

Topic: Planning, Training, Outreach, Funding, Liability

Pierce County, located south of Seattle in the southern part of the Puget Sound, includes the Port of Tacoma. This port, which accounts for 80 percent of the Title III reporting facilities within the county-wide LEPC, is one of the busiest ports on the West Coast. Pierce County also has one of the most active LEPCs on the West Coast. One advantage Pierce County had in developing an active LEPC was the prior establishment of a planning group under the CMA's Chemical Awareness and Emergency Response (CAER) program. The CAER program, created following the tragedy in Bhopal, India, encourages industry to work cooperatively within the community to identify chemical hazards and prepare for potential emergencies through the formation of community planning groups.

LEPC ACTIVITIES

Planning. One of the first activities in the LEPC planning process was reorganizing the county's emergency notification system. A single point of contact was named for all emergency notifications within the county, including the section 304 reporting requirement. The LEPC developed a uniform notification worksheet and distributed it to all facilities and response personnel within the county. Training programs are continuously offered on the notification system. The LEPC is incorporating its Title III emergency planning requirements into the county's overall integrated community preparedness plan, as a specific hazardous materials component of the overall generic plan. This approach was chosen in order:

- To maintain consistency with the emergency plans being done for different hazards; and
- To avoid duplicating planning efforts and thereby wasting limited resources.

To assist in developing its emergency plan, the LEPC requested each reporting facility to conduct a hazards analysis and an assessment of their response capabilities. Based on this information and the other Title III data submitted by facilities, the LEPC did a vulnerability analysis of hazards in the community. Using a mapping system, a facility can be located on a map of the county and any number of clear overlays can be added to show locations of schools, hospitals, nursing homes, etc. Other overlays display floodplains, transportation corridors, potential earthquake hazards, and other hazards. Using this planning tool, the LEPC can better identify potential hazards and affected areas in the event of a release. The LEPC is also meeting with each facility to create site plans for inclusion in the LEPC plan.

The LEPC is moving towards closer coordination with neighboring LEPCs. Initially, this multi-jurisdictional coordination is being accomplished through the sharing of LEPC meeting minutes. However, this coordination may be expanded in the future to include planning and exercising for emergencies affecting multi-jurisdictions.

Training. The LEPC has sponsored numerous hazardous materials exercises to evaluate and improve the emergency planning efforts and to foster training among responders. The LEPC has also developed and conducted many training sessions for responders on identifying hazardous materials and understanding the Title III requirements and their responsibilities -- for example, a two-hour course for law enforcement personnel on recognizing and identifying hazardous materials. These courses were designed specifically for first responders such as the police and fire personnel. Following the promulgation of the training requirements for hazardous materials responders under SARA section 126, the LEPC assisted in the development of training courses for first responders that meet those requirements. SARA section 126 requires all local emergency responders, including volunteer fire fighters, to be provided with training in understanding chemical hazards and proper safety procedures. All of the county training courses have been made available to response personnel in other counties on a limited basis.

Outreach. The LEPC has been very active in disseminating information on the Title III requirements to the regulated community and general public. Numerous seminars were conducted to provide facility representatives with detailed overviews of the Title III requirements.

The LEPC held workshops on each specific Title III provision as the deadline for that requirement approached. The LEPC compared a list of all facilities located in the county prepared by the Washington Department of Labor and Industry with their list of reporting facilities. Over 4,600 non-reporting facilities were identified as potentially subject to Title III requirements. To reach these facilities, apparently unaware of the Title III requirements, the LEPC is developing an insert on the Title III requirements for the local business newspaper (circulation: 16,000). The LEPC has provided public access to the Title III information through the public libraries throughout the county. The main branch of the Tacoma Library and the main branch of the Pierce County Library have on file the community right-to-know information submitted by facilities under Title III. Ten other branches have a workbook containing information on the Title III requirements and regulations. Facilities that inquire about Title Ill are referred to one of these libraries to obtain further information on Title III reporting requirements.

A brochure is being drafted to help increase awareness of hazardous materials and the public's right of access to Title Ill information on those hazards. Public service announcements on Title III were produced and distributed to all county television and radio stations to inform the public, including local industry, of the Title Ill requirements.

Funding. Basic costs for LEPC activities have been defrayed by the Pierce County Department of Emergency ·Management under its general operating budget and supplemented by the volunteered time of many LEPC members. In addition, the LEPC requested donations from all reporting facilities for the purchase of a computer system to help in managing the planning process and Title III community right-to-know information. The LEPC sent a letter to each reporting facility requesting a donation of $250 towards the purchase of the Emergency Information System/Chemical (EIS/C) software. The State has endorsed this computer program as a standard for managing Title Ill information. Follow-up letters were sent to all facilities that did not provide donations after the first mailing. At present, over $7,000 has been raised through this effort, enough to purchase the EIS/C software and to cover LEPC costs for postage, office supplies, printing, and some training.

Liability. During the establishment of the LEPC, many concerns were raised by LEPC members about their liability for participating in the planning process. Based on this concern, the LEPC played an active role in the passage of State legislation that provides liability protection to members of the LEPCs. One of the State Representatives on the LEPC has been a very active member from the beginning. Using his influence within the State legislature and his intimate understanding of the roles of an LEPC member, he was able to help ensure the timely passage of this legislation. The new law states that all LEPC members in Washington who, in good faith, assist in the development or review of LEPC plans are not liable for civil damages as a result of any act or omission in the development, review, or implementation of such plans. This protection does not apply to any act or omission that constitutes gross negligence or willful misconduct.

LESSONS LEARNED

Planning Helps to Prevent Chemical Accidents. The Pierce County LEPC believes that the planning process fostered under Title III and the pre-existing CAER program has helped reduce chemical hazards in the community. As a result of identification of chemical hazards and planning by the LEPC, many facilities have taken measures to prevent the possibility of serious chemical accidents, as well as to mitigate the consequences of such accidents. The knowledge gained in the county's planning efforts has led many facilities to increase or improve their employee training programs focusing on safer handling procedures. The LEPC also recognized that many facilities are not aware of the Title III requirements or the need for improved chemical process safety practices. Through their thorough outreach program, the LEPC has reached many of these facilities to make them aware of the requirements of Title III and, to some extent, the need for reducing chemical hazards in the community.

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SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

New York, New York; El Paso County, Colorado; Alexandria, Virginia; State of Maine

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices - for example, planning, compliance, information management, hazard analysis, and outreach.

The particular topics covered in each LEPC or SERC profile are listed at the upper right hand comer of the first page of the profile for easy reference.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

NEW YORK, NEW YORK

LEPC Profile

LEPC: 25 members, including city law enforcement, fire, transit, environmental, general services, health, and education officials, and representatives from the mayor's office, State assembly, Red Cross, community groups, business and industry, media, and State agencies. The chairman is a representative of the mayor's office.

Population: 7,500,000

Facilities: Over 9,000, ranging from large manufacturing operations to gas stations and metal fabrication shops

Topics: Information Management, Planning, Compliance, Outreach

The New York City LEPC is faced with one of the largest and most complex emergency planning assignments of any LEPC in the country.

The jurisdiction's enormous population and area combined with thousands of potentially regulated facilities presents an extraordinary challenge to the effective management of the Title III mandate.

The LEPC is chaired by a representative from the Mayor's Office, and has an Emergency Coordinator (from the Police Department's Office of Emergency Management) and an Information Coordinator (the Deputy Commissioner of the New York City Department of Environmental Protection (DEP)). The New York City Community Right-to-Know (CRTK) Law (Local Law #26 of 1988) provides the DEP with supplementary information on approximately 3000 hazardous materials used, stored, manufactured, or processed by facilities.

In addition, the CRTK law expands DEP's enforcement and inspection authority, effectively making DEP the lead agency for New York City Title III efforts.

LEPC ACTIVITIES

Information Management. Facilities provided the LEPC with either a facility inventory (Tier II) form, or a "Statement of Retraction" indicating their exemption from Title III reporting requirements. The LEPC reviews the reporting forms for accuracy, completeness, and trade secret claims, and then requests supplemental information in the event of incomplete submissions.

For facilities with extremely hazardous substances (EHSs) present on-site above specified threshold planning quantities, DEP requires facilities to provide specific chemical and storage information. The information obtained is entered into CAMEO, a computer software package, for DEP's risk assessment and inspection programs. CAMEO (Computer-Aided Management of Emergency Operations) is a MacIntosh-based software package designed by NOAA in collaboration with EPA to assist emergency planners and first responders with Title III activities and is used for planning, response, and enforcement purposes.

Three IBM-compatible personal computers are used to enter the information into the city facility-inventory database, which is designed for both emergency response and CRTK activities. Because the DEP system is otherwise an IBM-compatible system, a Macintosh-IBM converter is necessary to transfer information.

A Right-to-Know software mini-system, which will simplify the database structure and improve the speed and efficiency of information exchange with other agencies, is being developed. A system of portable laptop computers will expand the availability of the mini-system and assist response personnel at accident sites in accessing emergency information through modems and cellular phone hook-ups.

The LEPC uses chemical information for the whole range of Title III purposes. Citizen requests for Title III information must be met within ten business days, although the average turn-around on requests is three business days. The information can be delivered in various formats (photocopies, computer printout, etc.). Facility-inventory information and MSDSs are currently downloaded monthly onto the fire and police department computers from the city facility-inventory data base. This practice, which updates these departments existing files, will be unnecessary after the Title III mini-system is put into operation.

In addition, the LEPC uses facility submissions under Title III sections 302-3, 304, and 311-12 to coordinate compliance inspections and emergency incident response by identifying facilities not in compliance. Upon request, the LEPC has also provided a local hospital with information on neighboring facilities and their chemical inventories to assist in patient treatment.

Planning. The chemical accident planning required under Title III has been incorporated into an existing generic emergency planning system established by New York City for large -scale emergencies- such as severe weather, utility failures, fires, civil disorder, and epidemics. Rather than addressing specific operations for individual incidents, the emergency plan defines the specific roles of the various city, State, Federal, and private organizations involved in emergency response, and the procedures for activation of the established levels of response operations. The emergency plan stresses the importance of flexibility and adaptability in meeting the mobilization and communication needs of incident response in New York City.

The city emergency plan places preparedness responsibility for large-scale incidents with the Emergency Control Board (ECB) consisting of representatives of municipal agencies and various organizations. ECB activities are administered by the Police Department's Office of Emergency Management (OEM), which develops incident response procedures in addition to providing guidance and training for response personnel. A computerized city resource directory and a comprehensive directory of city officials are updated regularly to assist in the coordination of response activity.

An emergency management center staffed by senior city officials controls response operations for major emergencies, and is supported by the Emergency Coordinating Section (ECS) of middle managers who directly supervise the response. In addition, a Press Information Unit accumulates in formation and prepares press releases, and a Public Inquiry Unit may also be activated to respond to telephone requests on a hotline number. At the close of an incident, the ECS prepares an evaluation report to assist in any revision of the emergency plan.

As part of the city's hazardous materials planning, facility inspections are conducted to identify and plan for chemical hazards. The priorities for facility inspections are based on the hazards analysis results from the use of CAMEO's vulnerability/risk screening function. Facilities reporting EHSs are contacted for additional information, which is then entered into CAMEO to calculate the potentially affected geographic areas.

Over 100 facilities with high-risk, large vulnerability zones situated in densely populated residential areas have been inspected. The inspectors' findings and recommendations focus on improving the facilities' safety practices, including its management practices, spin and leak prevention, release containment, labeling, detection devices, safety and emergency equipment, employee training, and emergency contingency plans were issued to the facility. The follow-up activities to these inspections include referrals to other regulatory agencies for possible violations, including improper waste disposal, permits, and registration. Eventually, DEP plans to work with these facilities in reducing potential accident risks involving EHSs and other hazardous substances.

Compliance. The LEPC has received permission from the SERC to allow facilities to report information for both the city and Federal laws on the New York City Facility Information Form. They have received over 800 facility inventory forms, over 7,000 MSDSs, and approximately 150 site plans from 3,000 total facilities along with an estimated 3,500 Statements of Retraction this year. In addition, the fire department provides data to the LEPC on the presence of fossil fuels, petroleum products, and combustible or flammable chemicals or materials at almost 10,000 additional facilities. These facilities have been issued permits for the use of hazardous chemicals under the city fire code. A list of the reportable hazardous chemicals under the city's CRTK law, adopted from New Jersey Community and Worker Right-to-Know Act, is alphabetized by common name and synonyms, and includes Chemical Abstract Service (CAS) numbers in an effort to simplify chemical identification. It remains difficult to judge actual overall facility compliance as a result of the considerable ownership turn-over and bankruptcy among smaller facilities.

Outreach. The LEPC has identified facilities subject to CRTK reporting requirements from a number of different sources, including the DEP Bureau of Wastewater Treatment's facility discharge permit database; the section 302 facility database developed and maintained by the SERC to track facilities with EHSs; universities, libraries, and schools; other municipal agencies; trade associations; and communications with community groups and individual citizens. The LEPC also used facility information from the New York City Office of Business Development and Department of Finance, as well as other agencies such as the NY State Department of Labor database in outreach and compliance efforts.

To reinforce these existing outreach efforts, the LEPC has identified more than one hundred trade associations whose members may be subject to CRTK regulations. The LEPC has worked with two of these trade associations (the New York Sanitary Suppliers and the Association of Graphic Arts) to develop mailings and presentations on CRTK issues and has also offered compliance workshops for numerous municipal agencies. The LEPC has found that these presentations and workshops have resulted in significant numbers of facility submissions.

A citizen outreach bulletin on the city and Federal CRTK laws has been developed and will be distributed to neighborhood groups including community boards and public libraries. Similar information will also be distributed in pamphlets accompanying utility and water bills. A business outreach brochure on city CRTK reporting requirements has been mailed to 8,000 facilities identified by the SERC, and approximately 3,000 more were mailed to facilities complying under Title III. Outreach materials (the business brochure, and compliance forms and instructions) are also available from facility inspection personnel.

LESSONS LEARNED

Size Should Not Be an Impediment to Success. While it might appear that the task facing the New York City LEPC was extraordinary, the city's greatest challenge involves coordinating, rather than developing, the necessary resources. City officials believe the emergency plan for New York City serves as a flexible document that provides a comprehensive response strategy for the thousands of potentially serious incidents that could occur. The plan establishes an integrated structure of responsibilities and communication. The consolidation of facility identification information from various municipal agencies in the targeting of outreach efforts also strengthens this integrated approach.

Data Management is a Key to Large-Scale Efforts. Continual upgrading of the New York City LEPC data management system is essential to the success of the city's Title In efforts. The availability of CAMEO both simplifies and supports emergency planning, response, and inspection activities. The complexity of the facility inventory database -- which has separate sections for general facility information, CRTK requests, Material Safety Data Sheets, outreach efforts, toxicological data, fire department permits, and Statements of Retraction -- has convinced the LEPC to integrate these parts directly into a Title III mini-system easily available to local responders.

EL PASO COUNTY, COLORADO

LEPC Profile

LEPC: 23 members, including elected officials and representatives of the county attorney's office, emergency management agency, fire departments, police, hospitals, American Red Cross, League of Women Voters, and the Sierra Club.

Population: 90,000 (excluding the population of the City of Colorado Springs)

Facilities: 40-50, including aerospace and electronics manufacturers and metal fabricators.

Topics: Planning, Information Management, Training, Outreach, Use of Section 313 data

El Paso County is located along the Front Range of the Rocky Mountains, south of Denver. The county's terrain varies from semi-arid to alpine mountain forests. The city of Colorado Springs, which is the largest urban area in the county, has formed its own LEPC. The county LEPC handles Title III planning within the other parts of the county and coordinates closely with the Colorado Springs LEPC.

LEPC ACTIVITIES

Planning. The LEPC developed its Title III emergency plan as a hazardous materials annex to the county's multi-hazard disaster response plan. To maintain consistency, the multi-hazard county emergency response plan was used as a broad framework to develop the Title III plan. The sheriff's office was designated as the community emergency coordinator for the Title III plan to be consistent with its role as the designated emergency response agency as mandated by county resolution.

As a way of focusing their planning efforts, the LEPC surveyed each potential reporting facility. If a facility was determined to be subject to the Title III planning requirements, a standardized facility profile was completed. The profile includes facility information such as contacts, types of chemicals handled, on-site safety equipment, and other internal resources for responding to chemical emergencies. The fire department and LEPC assisted facilities in completing their profiles.

The LEPC used these profiles and information from other sources, including the regional Council of Governments and the State Highway Department (for transportation data), to develop a county-wide hazards analysis. Based on this analysis, the county was able to develop a draft plan, receive State comments, make revisions, and complete the final plan well before the October 1988 deadline.

To aid future Title III planning, the LEPC developed a questionnaire for facilities, especially new businesses, to determine if they may be covered under Title III. Based on the questionnaire results, if a facility appears like to be covered by Title III, a more detailed survey and the facility profile form is sent to the facility for the owner or operator to complete. If appropriate, LEPC representatives will meet with the owner or operator of the newly identified facility to review the facility profile, identify the facility coordinator, and explain the facility's responsibilities and requirements in the planning process.

Information Management. The LEPC recognized that computer capability was vital to effective managing of their planning process and all the Title III information. Specifically, the LEPC wanted to develop a computerized information management system that was affordable for the emergency response agencies in the county.

The Computer Aided Management of Emergency Operations (CAMEO), a planning and response management program, and dBASE IV software, an information management program, were chosen as appropriate tools to be used by the LEPC as a start. CAMEO, which runs on a MacIntosh computer, is used by the county for response and planning purposes.

CAMEO is used by itself to provide quick information on chemical hazards and help formulate response decisions by providing hazards analyses for the chemicals.

The dBASE IV program allows the LEPC to store all the Title III information, including the facility profiles. The database also can cross-reference MSDSs to obtain supplementary information - for example, if a coordinator for a facility where a response action is occurring is unavailable, the emergency responders can access the database by modem to identify other facilities that use the same chemical and attempt to contact those facility coordinators for more information. Additional software was acquired that allows emergency responders at an incident to access Title III information through a cellular phone modem.

The LEPC also developed procedures to relay Title III information via computer to response sites using "packet radio." A relatively new concept in communications, packet radio allows a computer to be connected to a high frequency radio (e.g., police radio) via a device called a radio modem that relays data to a receiving computer that also has a radio modem. The term "packet" is used because the information is transmitted via the radio modem in small packets of data (seven to eight words or figures) to a receiving computer, which must return a message that the information was received correctly before the next packet is sent. Because the information is transmitted in these small "packets" and there is down-time between each packet, one frequency can be used by five or six computer stations at one time. This is important in an emergency when many frequencies are in use. The LEPC believes this communications system is an invaluable tool in response actions, especially at very remote sites.

It allows the LEPC to transmit Title III information or other emergency information to response sites where conventional communication systems are non-existent, malfunctioning, or destroyed. In addition, the costs of establishing such a system are very small when compared with other, more elaborate communication systems. It relies mostly on existing hardware -- police and fire radios, personal computers and existing short wave radios, run by a network of HAM radio operators more than willing to volunteer in any emergency situation.

Training. The LEPC acts as a coordinating body for all hazardous materials training for responders in the county. The LEPC believes it should be a focal point for information on the training requirements under section 126 of SARA for local emergency responders. Section 126 establishes minimum levels of training for any private or public employee involved in hazardous materials response actions or hazardous waste clean-up operations. The LEPC disseminates information on these requirements and identifies how to obtain the proper training. Moreover, the LEPC will provide this information service to industries that may be covered by the requirements as well.

Local industry, especially the railroads, has provided the LEPC with access to hazardous materials training. With a major transportation corridor cutting across the county, transportation incidents are a major concern. Every year, the railroad brings a special hazardous materials training team to help train first responders, especially those from the rural fire districts. The training is free and includes classroom and "in the field" sessions focusing on transportation-related response situations.

Outreach. The LEPC uses various means to achieve public awareness of Title III requirements and information. Flyers were disseminated through trade associations; library displays were developed; inserts accompanied utility bills and fire permit applications; and the education channel on the local cable television system was used to broadcast information concerning Title III requirements.

The LEPC believes reaching its community's youth can be an effective way to inform parents and the children, themselves, of the presence of chemical hazards and how to be prepared as citizens if an accident were to occur. To reach the primary school level with information on chemical hazards and Tide III planning efforts, the LEPC developed library displays for the school library system. All school faculties were provided with a package of information on Title III and surveyed to determine if any classes or extracurricular groups would be interested in receiving a "Chemicals in Your Community" presentation, which is based on the EPA informational brochure on Title Ill. The LEPC is expanding this presentation beyond Title III to capture the interest of students in grades 1-6. Flyers, contest materials, and award programs are being designed to address topics of environmental safety and pollution and to attract the interest of these younger students.

Use of Section 313 Data. In addition to helping provide workshops on the section 313 requirements for reporting annual releases of toxic chemicals to facilities in the county, the LEPC has been active in evaluating the accessibility of the section 313 data. In June and July 1989, the LEPC was one of a handful of LEPCs in the country to participate in the testing of the national computer database containing information on releases and other data reported under section 313 prior to its release to the public.

The LEPC role in this study was to test the accessibility of the database and evaluate the user-friendliness of the menus. Problems were identified in the time taken to conduct information runs. Because the database users are charged for the time they are on the database, the LEPC believed EPA should institute program changes to reduce that time. The LEPC found the menus designed to help citizens use the database to be good tools in educating the public on the section 313 data benefits and limitations. EPA and the National Library of Medicine, which maintains the database for EPA, also received input from the LEPC on the types of information that the public would want from the database.

LESSONS LEARNED

Public Education is an Ongoing Challenge. The LEPC believes its role in educating the public, especially small businesses, is a continuous one. There are new businesses starting all the time and they are probably unaware of Title III and its requirements. Because of this situation, the LEPC must continually provide the basic Title III in formation while providing more detailed information on Title III and reducing chemical hazards in the community to the other, more informed facilities.

Another public education challenge concerns reaching facilities which are aware of Title III but are still not comp lying with the law's requirements. With the cost of doing business always increasing, many of these facilities are looking to keep expenses down and perceive Title III as an economic burden. It takes considerable motivation and energy to persuade these facilities to comply and, if appropriate, be involved in the planning process.

Motivated LEPC Members Are Critical To Success. Because the lack of funding is common among most LEPCs, the quality and commitment of LEPC members is crucial. Having LEPC members dedicated and possessing the proper background and credentials is the essential difference between a LEPC that fulfills the spirit of Title III and a LEPC that follows only the letter of the law. Integral to the success of a LEPC is keeping its members, virtually all of whom are volunteers, motivated. This is a continuous process, including regularly scheduling and holding monthly meetings, continual plan review and revision, and, if necessary, broadening the role of LEPC to meet the capabilities and commitment of its membership.

One-on-One Relationships Foster Better Cooperation. LEPC members believe they have established a successful planning process because of the personal relationships developed with the facility coordinators in their community. By conducting interviews with each reporting facility's coordinator, the El Paso County LEPC has been able to establish these one-on-one relationships. Each facility coordinator is able to better understand the facility's requirements and responsibilities under Title III, and the LEPC is able to obtain better cooperation from the facility's owner or operator in obtaining detailed planning information.

ALEXANDRIA, VIRGINIA

LEPC Profile

LEPC: 10 members, including city councilmen and representatives of the police and fire departments, citizens, the media, industry, and railroads

Population: 108,000

Facilities: 7 reported for section 302, including public utilities, a waste to energy facility, a dairy operation, and the Coca-Cola Bottling Company.

Topics: Planning, Inter-County Coordination, Compliance, Training

Alexandria, a primarily residential community, is located just south of Washington, DC.

It does not have any heavy industry but does have several major transportation corridors, including the Potomac Yard, a 540-acre railroad classification and marshaling yard operated by five major railroad systems.

The first true test of the LEPC's Title III emergency response plan, however, occurred not because of the railroads but because of a release of 1,425 pounds of chlorine from the Alexandria Sanitation Authority's water treatment plant

The incident occurred on August 24, 1989, when a six-inch section of 1.5" plastic pipe ruptured and a mechanical safety pressure valve simultaneously malfunctioned at the facility.

The police closed down two major highways and evacuated three blocks of an adjacent residential area.

The quick decision to evacuate was based on the LEPC's use of information obtained through a hazards analysis of the facility completed earlier during the Title III planning process. The Title III planning process helped to ensure a coordinated, timely response to this incident.

LEPC ACTIVITIES

Planning. The chlorine release demonstrated to the LEPC that its planning process was necessary and effective. A vital ingredient of that process was the identification and documentation of hazards within the community, including a special emphasis on transportation hazards. The fire department is required to develop a hazards analysis and a "Title III Facility Data Sheet" for each extremely hazardous substance (EHS) present at a facility that reported under section 302.

The hazards analysis identifies the hazards of the EHS and the probability and type of release that could occur at the facility. A description of the worst case scenario is also included in the hazards analysis. For example, the hazards analysis for the Alexandria Sanitation Authority facility identified a worst-case scenario of a total release of 28,000 pounds of chlorine from a rupture of all cylinders present at the facility, but also acknowledged that a more likely release would involve only one cylinder. A release quantity that would pose a high level of concern was identified and a vulnerability zone determined using the Technical Guidance for Hazards Analysis developed by EPA, the Federal Emergency Management Agency (FEMA), and the Department of Transportation (DOT).

The fire department prepares a "Title III Facility Data Sheet" to furnish the LEPC with basic information on reporting facilities' uses of an EHS. The form provides information on the likely transportation routes the EHSs would use within the city. Other required information includes identifying additional facilities at risk (e.g., hospitals, nursing homes, and hotels), methods of detecting releases, employee training programs, evacuation procedures, and a list of emergency response equipment and personnel available from each facility.

As part of the LEPC's emphasis on transportation, many of Alexandria's planning efforts have focused on the Potomac Yard. This railroad facility has been very cooperative and has developed a computerized tracking system that allows them to identify which hazardous substances are in each rail car. This system has proved useful in response situations, enabling emergency responders to identify, in advance, the hazards they are responding to as well as identifying potential hazards in other nearby rail cars. This tracking system has been tested by local responders in exercises conducted at the railroad yard.

Although Potomac Yard is in the process of downsizing railroad operations, Alexandria's other major transportation corridors, specifically highway routes, pose additional concerns to the LEPC. To address these concerns, LEPC representatives serve on a multi-jurisdictional task force on hazardous materials transportation. This task force is exploring means of reducing the transportation of hazardous materials and the likelihood of hazardous materials accidents. The task force is also developing incident response procedures for multi-jurisdictional responses.

Inter-County Coordination. As a suburban community sharing many transportation corridors with other cities and counties, Alexandria has recognized the need for multi-jurisdictional cooperation in developing its emergency plan. The city has developed mutual aid agreements with Fairfax and Arlington counties. Personnel and equipment of one jurisdiction may be dispatched into another jurisdiction as needed and requested by that jurisdiction; for instance, the Virginia State Police responded to the chlorine release at the Sanitation Authority to assist in closing a nearby major interstate highway.

The city's dispatcher, who also serves as the city's emergency notification recipient, has a listing of equipment and personnel from other jurisdictions that can be made available for a response in the city. The city, as a member of the Metropolitan Washington Council of Governments, has also entered into a regional emergency response planning effort to further coordinate multi-jurisdictional response within the Washington, DC area.

The Alexandria LEPC appreciates the value of maintaining liaison with adjacent LEPCs as well as awareness of its facilities and other related activities. The chairman and other LEPC members have attended meetings of LEPCs in both the District of Columbia and Fairfax County.

Compliance. The LEPC has actively pursued obtaining compliance from potential reporting facilities. A comprehensive document, What Alexandria Businesses Should Know About SARA Title III, was developed to explain Title III requirements and the role of the LEPC. This document was distributed to businesses that have been issued a hazardous materials use permit (see next paragraph). The Alexandria Chamber of Commerce also helped the LEPC create an exhibit to use at local business conventions.

A city ordinance requires all commercial businesses that store, use, or handle hazardous substances to obtain a hazardous materials use permit from the fire department. As part of the review and approval process, the fire department conducts a facility inspection.

This fire prevention inspection verifies the types and quantities of the hazardous chemicals stored, used, or handled at the facility. The inspectors also verify that pressure valves and other safety equipment are laboratory-rated and calibrated and that personnel operating such equipment are properly certified. Underground storage tanks are checked to ensure they are located at the proper depth and meet specific Federal tank standards. In addition, facilities that file for a hazardous materials use permit are sent a Title III information package.

The LEPC as signed the fire department the responsibility of conducting inspections to identify those facilities subject to Title III that have not yet reported. The fire department targets businesses that have not reported under Title III but, based on fire department personnel's knowledge and experience, are thought to handle hazardous chemicals.

Failure to comply with Title III may prevent a facility from receiving a hazardous materials use permit and, therefore, from operating. Using this permitting process, the city believes it has achieved almost total compliance with Title III.

Training. To increase the level of hazardous material awareness and planning expertise of LEPC members, LEPC members have been encouraged to take the week-long Hazardous Materials Contingency Planning course developed by EPA, FEMA, and DOT. This course provides guidance on developing an effective planning process and contains Title III-specific modules. A three-day training course, underwritten by EPA Region III, has been offered for first responders as well as LEPC members. The course was held over a weekend to allow volunteers to attend more readily. The first two days of the course were classroom instruction on Title III requirements and first responders' duties and responsibilities.

The third day was devoted to a field exercise to test their skills in a simulated situation. A truck was used in simulating a transportation accident. In addition to police, sheriffs, fire department personnel, and LEPC members attending this training, facility representatives were invited. Five out of the seven facility representatives attended this course along with their emergency response personnel.

The facilities in the city conduct or coordinate their training exercises with the LEPC. The Alexandria Sanitation Authority had, for example, exercised its plans with the city and neighboring Fairfax County prior to the accident. Joint training with Potomac Yard is conducted regularly.

To gain a better understanding of its mission within the city, the LEPC has held its meetings, from time to time, at facilities subject to Title III reporting, including Potomac Yard, Ogden Martin Systems, and Potomac Electric Power Company. The LEPC was given a briefing of the facility's operation and a tour of the facility by each of its hosts. This liaison keeps LEPC members abreast of activities, capabilities, and areas for improvement at each of these facilities. Recently, an LEPC meeting was held in the offices of the Chemical Transportation Emergency C enter (CHEMTREC), operated by the Chemical Manufacturers Association in Washington, DC.

LESSON LEARNED

Training and Preparedness are the Keys to Response. The incident at the Alexandria Sanitation Authority demonstrated the value of the joint hazardous materials training that the LEPC and the Sanitation Authority personnel have received. It also helped ensure that all responders knew how to approach the incident and work together effectively. Regular exercises of emergency procedures, such as have been conducted at the Sanitation Authority facility and the Potomac Yard, are vital to the effectiveness of the LEPC's planning process.

The city was prepared for this incident through the comprehensive planning process established under Tide III. Critical time was saved by accessing the hazards analysis and data sheet prepared for this facility to determine what response action to undertake. By having this information available, informed decisions could be made rapidly and knowledgeably. By being prepared and trained, the LEPC was able to effectively identify the hazard, secure the site, and mitigate the release.

STATE OF MAINE

State Profile

State Characteristics: 16 LEPCs, designated by county

SERC Membership : 14 members, including the Commissioners of Environmental Protection, Human Services, and Labor, the directors of Emergency Medical Services and Emergency Management Agency (who serves as the chair); the Chief of the State Police; and representatives of the Maine Fire Chiefs' Association, municipal government, a professional firefighters' union, volunteer firefighters, organized labor, and an environmental organization.

Topics: State Right-to-Know Law, Funding, International Coordination, Training

The State of Maine provides an excellent example of states that are incorporating the Title III provisions into state law and strengthening the requirements to fulfill the spirit of the Federal law. In addition, Maine has considered the funding issue and has establish an elaborate fee system to fund the program and designated a state agency to provide administrative support directly to the State Emergency Response Commission.

SERC ACTIVITIES

State Right-to-Know Law Strengthens Title III Requirements. On June 26, 1989, the Governor of Maine signed into law legislation, "An Act to Implement, Administer, and Enforce the United States Emergency Planning and Community Right-to-Know Act of 1986." This law (PL 464) formalized the establishment of the SERC and LEPC structure. While containing the basic reporting elements of Title III, this State legislation expands the planning requirements well beyond the scope of the Federal provisions.

Under the new state statute, the Maine SERC has the added responsibilities of monitoring, participating, and reviewing LEPC exercises; coordinating Title III activities with the Maine Emergency Operations Center-, and reviewing hazardous materials training courses offered throughout the State. Pl, 464 also directed the LEPCs to identify facilities that reported under section 313 for additional planning; annually review and exercise their emergency plan; and incorporate facility plans into their planning efforts. Membership in the SERC and LEPCs was mandated to include broad-based participation of public- and private-sector groups and citizens.

The scope of the Title III planning requirements for facilities with an extremely hazardous substance (EHS) exceeding the threshold planning quantity was greatly expanded by PL 464. Primarily, PL 464 requires these facilities to develop a comprehensive emergency plan by December 26, 1989, that must be annually exercised and reviewed. Each facility plan must identify and describe the facility's warning systems; identify transportation means and routes for EHSs; describe their employee training and testing programs; list companies that provide emergency response equipment and personnel to the facility in case of an accident; and list all mutual aid agreements between the facility and emergency responders or public safety agencies.

By October 1, 1989, these facilities must also have made primary response equipment available for use by emergency responders for containment of EHS releases. If not already available, this equipment must be purchased by the facility or made readily available through agreements with nearby facilities. In addition, any facility that provides personnel or equipment through mutual aid agreements with State or local entities is now immune from civil liability under Maine law for the use of its equipment and personnel except for cases of gross negligence.

On March 1, 1990, state legislation was enacted (PL 638) that expanded the definition of facility to specifically include transit facilities such as railroad and marine terminals. Any materials stored for more than 12 hours at these facilities would be subject to all applicable regulations under PL 464. In addition, PL 638 provided the state with the authority to conduct inspections of facilities to insure compliance. In the event of an accident, the state may investigate and inspect facilities to determine the cause and circumstances of the incident. The state can order a facility to undertake any appropriate reporting, facility response mitigation and corrective actions as deemed necessary.

The state is also considering developing a Hazardous Materials Administrative Inspection Team, composed of representatives of state environmental, emergency management, and transportation agencies.

This inspection team would focus on facilities subject to PL 464. PL 638 requires the development of a checklist to facilitate the inspection which will be primarily a compliance audit.

Funding. Another provision of Maine's law is the establishment of a system for assessing and collecting fees from facilities reporting under sections 312 and 313 of Title III. In addition, the SERC collects an annual facility registration fee from all facilities that have submitted any information under sections 311 and 312 to the SER C or have filed a Form R under section 313 with the State and EPA.

The fees assessed for facilities reporting under section 312 are determined based on the average daily amount in pounds of each EHS and hazardous chemical present on-site, while the fees assessed for reporting under section 313 are based the total releases of each toxic chemical. All fees are due annually.

The following fee schedules have been established by the SERC:

- Annual facility registration fee, $50, due October 1st;
- Annual inventory fees (section 312), due March 1st;

Extremely Hazardous Substance Fees	
Total average daily amounts of:	Fee:
less than 99 lbs.	$20
100 - 99 9 lbs.	$50
1,000 - 9 ,999 lbs.	$70
10,000 - 99,999 lbs.	$100
100,00 0 - 999,9 99 lbs.	$150
greater than 1,000 ,000 lbs.	$200

Hazardous Chemical Fees	
Total average daily amounts of:	Fee.
less than 10,000 lbs.	$ 0
10,000 - 99,999 lbs.	$50
100,000 - 999,999 lbs.	$75
greater than 1,000 ,000 lbs.	$100

Annual toxic release inventory fees (section 313), due July 1st: Toxic Release Fees	
Total release of:	Fee:
0 lbs.	$ 0
1 - 499 lbs .	$20
500 - 99 9 lbs.	$50
1,000 - 9 ,999 lbs.	$70
10,000 - 99,999 lbs.	$100
100,00 0 - 999,9 99 lbs.	$150
greater than 1,000 ,000 lbs.	$200

A $5,000 fee cap per facility has been established. Retail marketers of petroleum products with a storage capacity of 75,000 pounds or less per product (e.g., gas stations) and commercial agricultural operations (e.g., farmers) are exempt from paying reporting fees.

All fees collected will be placed in the Emergency Response Commission Fund. Because fees have been collected for the first year, the SERC would like to provide the LEPCs these funds based on a priority basis (i.e., identified needs or hazard s) rather than dividing them evenly among Maine's 16 LEPCs. This prioritization process will direct funds to LEPCs based on a number of factors, including the number of facilities, the amount of EHSs, and the potentially affected populations within each county.

The remaining funds collected in the Emergency Response Commission Fund will be disbursed to: employ additional staff at the Maine Emergency Management Agency (MEMA), which provides administrative support to the SERC; fund county training programs; and provide training grants to State and local emergency response personnel. The SERC has hired a full-time hazardous materials planner whose time will be dedicated to assisting LEPCs in their planning efforts and to integrate the LEPC plans with the overall State emergency plan.

International Coordination. Maine meets annually with representatives from five Canadian provinces to discuss issues of common concern. For more than a year, this International Emergency Management Group has been focusing on hazardous materials issues. A steering committee, which meets every six months, identified six cities on the border that have industries handling hazardous materials. One town has a paper company with facilities on both sides of the border.

Two committees were recently formed to address the hazardous materials issues for these six towns. The committees will focus on planning and implementation and are composed of representatives of provincial and Federal Canadian emergency management ministries, MEMA, and local Canadian and American emergency management officials.

Training. With section 305(a) training grant funds, the SERC has hired trainers to teach a four-hour hazards recognition course. Using a "train-the-trainer" technique instructing people on how to train others, the SERC has now trained more than 9,000 emergency responders. In addition, the SERC, through the local Chambers of Commerce, has provided its LEPCs and industry a short two-hour course on the Title III requirements.

At present, the SERC is preparing to hold five workshops on the training requirements of section 126 of Superfund Amendments and Reauthorization Act for local emergency responders. Section 126 establishes minimum levels of training for any private- or public-sector employee involved in hazardous materials response actions or hazardous waste clean-up operations. As part of the workshop, the SERC will identify participants' individual training needs and the level of training required to meet their needs.

LESSONS LEARNED

Consensus is the Key to Developing Legislation. The passage of Maine's emergency planning and community right-to-know law was accomplished through the development of a consensus among the various groups interested in increasing public awareness of, and planning for,, chemical hazard s. The various interest groups involved in this cooperative effort included State agencies, industry, environmental and labor groups, and the State Legislature.

While it was a long process with many compromises from all interested parties, a law, which greatly strengthens the planning elements of Title III, was passed with the approval of all interested parties. The SERC believes that, through this consensus, the regulated community has a better understanding of the law's Purpose and its responsibilities. Also, a more comprehensive planning process has been established that formally incorporates the expertise and resources of the facilities into the planning effort of each county in the State.

Conduct Thorough Research Before Establishing Fees. The Maine SERC believes its fee system established fees that may be conservative and which may lead to the underfunding of its SERC and LEPC activities. Because many facilities subject to reporting in Maine do not handle large quantities of hazardous chemicals, most facilities are not paying anywhere near the $5,000 fee cap. The SERC realizes the fee assessed per chemical needs to be raised to reflect the fact that most facilities subject to the state law do not handle large quantities of hazardous chemicals.

The Maine SERC believes it is essential that any SERC considering a fee system should research the number of facilities subject to reporting, the number of hazardous chemicals handled at each facility, the maximum quantities of hazardous chemicals present at one time. This should be compared with the needs of the SERC to administer its Tide III program along with the needs of its LEPCs. Hence, a SERC should balance its needs with the scope of the subject facilities to establish a fee system that is reasonable for the facilities while assuring adequate funds to meet the needs of the SERC and its LEPCs.

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Tinker Air Force Base, Oklahoma; State of Connecticut; Cumberland County, Maine; Wyandotte County, Kansas

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve. Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices - for example, planning, compliance, information management, hazard analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed at the upper right hand corner of the first page of the profile for easy reference. The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

TINKER AIR FORCE BASE, OKLAHOMA

LEPC Profile

LEPC: 32 member Tinker AFB Environmental Protection Committee (representatives of the various tenant and major staff organizations; Chairman: Air Logistics Center Vice Commander)
Workforce: Over 26,000 military and civilian personnel
Facilities: 24, primarily related to aircraft maintenance activities
Topics: LEPC Organization, Compliance, Planning, Information Management, Outreach, Training

Tinker Air Force Base (AFB) is located within industrialized Oklahoma County, adjacent to Interstate 40 and Midwest City, which has a population of 55,000. Tinker AFB is one of five Air Force Logistics Centers nationwide, and one of the largest military and industrial complexes in the world.

Two hundred and fifty-four acres of floor space are devoted to industrial facilities where the majority of the work force reconditions, modifies, and services military aircraft, missiles, jet engines, accessories, and other military products.

Base operations include the largest electroplating facility in the country, with 150 process vats; a 7 5-vat chemical cleaning facility; two painting and paint stripping facilities; and numerous support operations. Tinker AFB also has an Industrial Wastewater Treatment Plant (IWTP) that treats approximately one million gallons of wastewater daily.

LEPC ACTIVITIES

LEPC Organization. In December 1989, Tinker AFB decided to comply voluntarily with the requirements of Title III in recognition of the value of such efforts to the surrounding community and the importance of strengthening inter-governmental emergency response communication. This determination was consistent with and pursuant to Department of Defense (DOD) policy, which encourages DOD facilities to comply with Title III to the greatest extent practicable.

In keeping with the demands of national security arising from its classified operations, the base was designated by the Oklahoma Emergency Response Commission as a separate Local Emergency Planning District within Oklahoma County in February 1990.

The Tinker AFB Emergency Planning Committee (LEPC) is comprised of the members of the base Environmental Protection Committee. Upon completion of the contingency planning process, Tinker AFB may serve as an example for the other federal facilities, including other Air Force Logistics Centers, in complying with Title III.

Compliance. The Environmental Management (EM) Directorate serves as the central point of contact for environmental compliance at Tinker AFB, and, in that role, ensures Tinker AFB's compliance with the requirements of Title III.

As part of its Title III program, the EM Directorate is responsible for identifying the quantities and locations of all hazardous materials stored and used on the base. For the purposes of reporting under Title III, each building on the base is considered to be a separate facility. Once a covered facility has been identified, designated facility managers are briefed on the Title III program and their compliance responsibilities.

Building 3001, covering 61 acres of floor space, is the largest industrial facility in the world. To survey this facility, a twelve-person environmental compliance team divided the building into five sections for inspection.

Extremely hazardous substances (EHSs) present in this facility above their threshold planning quantities include sodium cyanide, potassium cyanide, phenol, sulfuric acid, and nitric acid.

The survey of Building 3001 and other facilities on the base provided valuable information for the Tinker AFB Fire Department concerning the storage locations of EHSs, and was used in the development of the Title III emergency response plan.

The base has provided the Oklahoma SERC with information on all EHSs that have been identified at the base, and intends to comply with the public access requirements of section 324.

Planning. Prior to its involvement in Title III efforts, Tinker AFB had prepared a spill prevention and response plan addressing many of the hazardous substances contained in its facilities.

The base has finalized its Title III contingency plan, which was developed separately from the preexisting spill prevention and response plan. Now that the emergency response plan has been finalized, the base intends to carry out table-top exercises to prepare surrounding municipalities for coordination of responsibilities in the event of a serious hazardous materials incident.

The base maintains a 24-hour emergency spill response team, composed of safety, health, environmental, fire, and other specialists and headed by the Tinker AFB Fire Department, whose representative serves as the on-scene commander for most spills.

The Fire Department also maintains a hazardous materials vehicle, which serves as a Mobile Command Post. This specialized vehicle is equipped with emergency response and decontamination equipment and a Wang lap-top computer which will be linked with the Tinker AFB Title III computer system to retrieve MSDSs and facility-specific information.

Information Management. Tinker AFB is using a locally developed dBase III program to help manage the volumes of data collected by the EM Directorate and present the data in Tier II form for each facility.

In the near future, the base will implement the second phase of its data management system, the Chemical Tracking System (CTS), developed by the Tinker AFB Directorate of Communications-Computer Systems.

CTS will 2 incorporate the information currently stored in the dBase system into a more comprehensive structure that contains MSDS information and tracks storage locations of all EHSs. The update system will also contain section 311-312 information for other hazardous chemicals.

Outreach. Information on Title III was provided to Tinker AFB management personnel during the hazardous material inventory survey of base facilities. In addition, the Tinker AFB newspaper, the "Tinker Take-Off," has featured several articles on Title III, the latest describing compact disc information on the chemicals used and stored on the base. Once the emergency response plan is approved, outreach information will be provided to the media in surrounding communities to update citizens on Title III activities at Tinker AFB.

Training. Ongoing training is provided to the emergency response team, as well as to the personnel working in shops that use hazardous chemicals.

A number of the response team's first responders have received training from the state fire academy; the others have been trained in conjunction with Oklahoma State University.

In the future, there are plans to provide further training for all facility managers, the emergency response team, and other personnel as mandated by section 126 of SARA, which requires that local emergency responders be provided with training in understanding chemical hazards and proper safety procedures.

To train these specialists, Tinker AFB plans to take advantage of EPA training courses and to develop in-house training packages, and to coordinate training efforts with nearby LEPCs.

LESSONS LEARNED

Worker Right-to-Know Coordination Supports Title III. The size and complexity of the task of identifying the hazardous materials for even one of Tinker AFB 's facilities posed a difficult task to the EM Directorate.

As a result, it was essential to seek the cooperation of the base work force during the course of the hazardous materials survey.

At the present time, worker right-to-know efforts are supported by a program designed to reinforce the awareness of the locations and hazards posed by hazardous materials as well as other regulated chemicals, as required under the Occupational Safety and Health Administration's Hazard Communication Standard.

Participation of Federal Facilities is Part of the Title III Mandate. The determination to voluntarily comply with the reporting requirements of Title III is consistent with DOD policy, which encourages DOD facilities to participate in the Title III program.

Furthermore, the base was able to address the national security problems that would otherwise have limited their Title III achievements by establishing its own LEPC.

This decision satisfied the SERC because it enabled the emergency planning concerns arising from Tinker AFB to be directly addressed by the base in cooperation with the

Oklahoma County LEPC, while still allowing the public around Tinker AFB access to non-national security information.

In addition to the identification of chemical hazards at Tinker AFB, this spirit of cooperation between Tinker AFB and the surrounding community will provide expanded and faster access to emergency response resources. Finally, by creating a functional Title III emergency planning organization in three months, the base serves as an example to federal facilities of how management can follow the Title III mandate within the scope of normal operations.

Outreach Magnifies the Benefits of Emergency Planning. The Title III program at Tinker Air Force Base has been instrumental in focusing emergency planning efforts on EHSs. These planning efforts are addressing off-site impacts and have led to better cooperation with state and local authorities on common emergency response and preparedness concerns. Awareness by neighboring communities and local government officials of this vital, comprehensive program will enhance the success of the program, and assure the public that Tinker AFB officials are fully aware of their responsibilities and are truly concerned about the public's well-being.

STATE OF CONNECTICUT

SERC Profile

State Characteristics: 156 Local Emergency Planning Committees, with over 2200 members, including 153 single municipality districts and 3 multi-municipality districts consisting of sixteen municipalities

SERC Membership: 16 members, including representatives from the Departments of Environmental Protection (Chair), Transportation, Health, and Public Safety; Connecticut Conference of Municipalities; Offices of State Fire Administration, Emergency Management, and Policy and Management; State Senate; New Haven Department of Fire Services; Bureau of State Fire Marshals; labor, industry, and the League of Women Voters

Topics: Planning, Funding, Information Management, Outreach, Training, Use of Section 313 Data

In November 1985, the Connecticut Governor appointed a 60-member Task Force on Accidental Toxic Releases, composed of representatives from state and local government agencies and industry, to address release prevention and emergency response issues. Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986, the Task Force laid the groundwork for Title III in Connecticut and produced legislation to institute emergency planning and community and worker right-to-know programs, and to establish an inspection system for hazardous materials transportation and storage equipment. Title III was implemented by Public Act 88-246, which designated the Department of Environmental Protection (DEP) as the lead agency for administrative matters, and the Office of Emergency Management (OEM) as the lead agency for emergency planning.

SERC ACTIVITIES

Planning. Connecticut was one of the first states to achieve 100 percent compliance with the initial emergency planning requirements of Title III. OEM supported this accomplishment by providing emergency planning guidance to Connecticut's Local Emergency Planning Committees (LEPCs).

OEM distributed the Hazardous Materials Emergency Planning Guide (NRT-1) together with a supplemental OEM bulletin providing clarification and guidance on each of the nine planning elements required under section 303 of Title III. OEM staff has also developed a model LEPC emergency plan and DEP developed Connecticut-specific guidance on hazards analysis. The hazards analysis guidance indicated that LEPCs should initially either request a vulnerability analysis from facilities subject to section 302 or perform the analyses themselves using the Technical Guidance for Hazards Analysis, a joint publication of EPA, the Federal Emergency Management Agency (FEMA), and the Department of Transportation (DOT), and DOT's Emergency Response Guidebook.

In December 1989, a member of the SERC, the Connecticut Business and Industry Association, produced the Emergency Resource Manual, developed from a survey of over 100 businesses across the state. The 130-page manual has been distributed to all Connecticut LEPCs and fire departments, and serves as a means of quickly identifying response resources available at nearby facilities in the event of a hazardous materials incident. These emergency response resources are separated into 11 categories: expertise and personnel; instruments and labs; chemical handling equipment; special construction equipment; fire suppression equipment; special mechanical equipment; neutralizing chemicals; personal protective equipment; breathing apparatus; spill control/cleanup materials; and tanker truck facilities. Each category is broken down alphabetically by the city in which the facility is located, and includes the company name, phone number, 24-hour phone number, and the specific type of resources available; an index provides the street address and emergency contact for the facility. The manual also includes sample provisions for borrowing or use of these resources in the event of an emergency.

Funding. Connecticut Title III activities have been funded from several sources, including a state trust fund, Title III training grant funds, and appropriations from the state general fund. The Connecticut Municipal Liability Trust Fund was created from a budget surplus at the close of FY '86; over $1 million was made available to 74 Connecticut cities and towns for Title III-related hazardous materials planning, training, and surveys. Title III training grants provided through FEMA totaled $72,000 in 1987, $52,000 in 1988, and $30,000 in 1990 for training of state and local administrative and response officials; $100,000 was appropriated in both 1989 and 1990 from the Connecticut General Fund for the administration of the Title III program by the SERC. The majority of Title III program accomplishments, however, have been achieved by the staff of agencies represented on the SERC. As a result, the staff costs have been absorbed by individual agency budgets, rather than by the SERC.

Information Management. DEP has developed a data management system using the SAS statistical software package. The system consists of two modules: administrative and Form R. The administrative module is a tracking program for the reports received under sections 302, 311-312, and 313, and contains components that create a facility reporting history; log in public information requests; enter and update LEPC membership; and generate reports on facilities, LEPCs, and public information requests. The Form R module allows the entry of all information on completed toxic chemical release inventory reporting forms (Form R) received from facilities, as well as the generation of reports from this data.

A third module of the data management system is being developed for accidental release information reported under Title III section 304 and Connecticut law, which is more comprehensive and requires reporting of any quantity of a petroleum product or hazardous waste which is spilled or released. In addition, local fire departments have found the information on chemical quantities and storage locations contained in the section 312 Tier II form to be valuable; consequently, the SERC currently requires the submission of Tier II forms rather than Tier I forms.

Outreach. The Connecticut SERC has made education a major priority in its Title III implementation activities. In the last two years, the SERC and Waterbury State Technical College have sponsored an 18-hour program on Title III compliance for representatives of business and industry. Over 7,000 Title III compliance brochures have been mailed to potentially covered facilities and organizations. The SERC also sends bi-monthly mailings on Title III issues to LEPC chairpersons. In conjunction with the League of Women Voters, the SERC has produced an informative citizen's guide called "An Ounce of Prevention" identifying the roles of SERCs, LEPCs, communities, government, and business and industry in the Title III effort. The guide is distributed at conferences and made available to LEPCs for distribution. Finally, the SERC encourages its members and staff to accept speaking engagements with community and business groups.

Training. The SERC has sponsored or supported a number of Title III training activities. Regional training conferences for over 400 local officials were conducted from October 1987 to January 1988. In the summer of 1988, a series of outreach workshops were held with over 800 attendees from state and local government and the media. A two-day, statewide LEPC conference, held in May 1989, had almost 200 attendees and a second conference was held in February 1990. All of these activities were developed with the assistance of Title III training grants. In August 1989, OEM conducted a four-day exercise design course for LEPC members. The SERC also sponsored four hazmat personnel safety courses in 1988 and 1989 for emergency medical personnel, transportation road crews, and municipal police.

In addition, the SERC and the Commission on Fire Prevention and Control (CFPC) have sponsored over 130 training courses for first responders, police officers, hazmat technicians, hazmat instructors, and LEPC members which have reached a total attendance of over 1700. Courses include first responder hazardous material recognition, contingency planning, the Computer-Assisted Management of Emergency Operations (CAMEO) system, and emergency response.

They were taught as the by-product of a series of train-the-trainer courses, which achieved substantial savings in training funds while preparing 220 instructors by the end of 1988. CFPC has also sponsored Incident Command training for 196 emergency management officers in 22 separate programs. More than 75 additional first responder courses were offered in 1989, and a number of additional instructors have been trained to deliver courses on first responder procedures and the chemistry of hazardous materials.

Use of Section 313 Data. The SERC has analyzed the 1987 Toxic Release Inventory (TRI) data by media, chemical, and facility. The TRI data on emissions to water were examined in conjunction with discharge permits issued by the Bureau of Water Management, and the ten companies reporting the highest level of emissions were all permitted by the state. While most of the chemicals that were reported in the TRI are in compliance with existing regulations and standards, in some cases additional controls are necessary and are being implemented under the state water program. In addition, TRI data have been presented as evidence in support of chemical-specific and emission control legislation pending before the Connecticut legislature.

LESSONS LEARNED

Effective Coordination of SERC Activities Enhances Achievements. Without sufficient funding for its own staff, the SERC has relied upon the staff of its members to achieve its Title III obligations. Fortunately, the agencies and groups involved have contributed successfully to these efforts under the overall leadership of DEP, whose deputy commissioner serves as the chair of the SERC. The extensive Title III training program supported by the Commission on Fire Prevention and Control and the Emergency Resource Manual developed by the Connecticut Business and Industry Association serve as prime examples of the contributions of an active, well-coordinated SERC.

Education and Awareness are Critical to Continuing Title III Efforts. Outreach for the general public, business and industry, local officials, and emergency responders is an important aspect of a successful, long-term Title III program. Connecticut has made extensive efforts to provide preparedness and response training as well as outreach materials for all members of the community in order to establish a basis for future activities. As a result of these efforts, the SERC experienced a threefold increase in section 312 filings from 1987-88 to 1988-89, and has received over two hundred Title III information requests from the public.

CUMBERLAND COUNTY, MAINE

LEPC Profile

LEPC: An elected official and representatives from police, emergency management, fire, emergency medical, and health departments, hospitals, citizens groups, and facility representatives

POPULATION: 230,000

FACILITIES: 141 facilities reporting under section 311-12 and 22 facilities reporting under section 302

TOPICS: Planning, Exercises, Training

Cumberland County is located along the southern coast of Maine, and is the most industrialized and densely populated county in the state. It contains the largest city in Maine, Portland, which has a population 63,000; the 125 square mile Sebago Lake; and several major transportation routes, including US Route 1, Interstate Highways 95 and 295, and State Route 302.

On July 15, 1989, Rigby Yard in South Portland reported a leaking railroad tank car. The initial response unit surveyed the scene and reported the placard information and tank car number to the fire department; minutes later a second unit donned encapsulating suits to confirm this information, identifying the substance as muriatic acid. After a brief meeting, senior police and fire officers decided an evacuation was necessary, and designated response units to carry out the evacuation while other units sealed off the area.

The plume modeling system from the Computer-Aided Management of Emergency Operations (CAMEO) system, a software package designed to assist emergency planners and first responders with Title III activities, was employed to assist with the response to this event. Information on the substance, its rate of release, and the weather conditions were input into the modeling program, which produced a plume diagram that was overlain on a local map to assist responders in determining areas for evacuation.

The responders established a forward command post to carry out the immediate response operations and a rear command post or staging area for equipment and the media. Rotating pairs of response personnel spread four tons of soda ash under and around the tank car during the next several hours; next, the leak was plugged, and the remaining muriatic acid off-loaded. The following day, several units returned to monitor the purging of the remaining product and vapors from the tank car before it was returned to the manufacturer for inspection. Over 150 responders were involved in response activities at the site; these personnel and their equipment were provided by several nearby municipalities and included two dozen response vehicles.

LEPC ACTIVITIES

Planning. The events surrounding this and another more recent transportation-related incident that involved muriatic acid validated the LEPC's emergency planning assumptions and response procedures to the extent that they had been developed. Principal planning successes highlighted by these events include the identification of available public and private response resources, industry contacts for technical and resource expertise, and sheltering locations. In addition, the development of standard operating procedures (SOPs) and staffing protocols for an incident command post and equipment staging area during the planning process allowed for improved coordination of response activities.

In both recent events, however, the complexity of the response operations and the necessity of relocation and sheltering produced situations that went beyond the range of elements contained in prior full-scale exercises. One revision to the LEPC response plan suggested by these experiences involved access to the incident site. Private industry response vehicles, equipment, and personnel could not be readily identified by officers in charge of maintaining the security of the incident site. On weekends or off-days, industry responders and clean-up personnel do not normally have company identification readily available. As a result, the LEPC may develop a system of identification cards for private citizens who may be needed at an emergency response operation, and an insignia system (e.g., a colored ribbon on the radio antenna) for response and clean-up vehicles.

These incidents also highlighted several difficulties in carrying out an evacuation: (1) giving directions to the nearest shelter proved excessively time-consuming for the personnel in charge of the evacuation; (2) tourists in nearby hotels were unwilling to evacuate to shelters and wanted to move to another hotel or motel; and (3) evacuees in shelters need to have access to the latest incident information because they are generally cut off from normal media connections -- radio and television. As a result, the Fire Department is considering a system of pre-designed cards with directions for evacuees that can simply be handed out by response personnel. The cards will provide a list of things to do before evacuating, a list of necessities to bring to the shelter, and an indication of the nearest safe hotels or motels for tourists. Existing communication and response procedures have also been updated to insure that the latest information on the incident will be transmitted regularly to evacuation shelters. The Title III planning process in Cumberland County also identified a major deficiency in response capability -- the lack of sufficient emergency response vehicles. The Cumberland County Fire Chiefs Association (CCFCA) has set a goal of three units for the county in keeping with the provisions of Maine Public Law 464, which implemented and expanded upon Title III.

This law requires facilities reporting under SARA Title III section 302 to have response vehicles and/or equipment on-site, provide or buy this equipment in conjunction with the local fire department, and/or establish a mutual aid agreement with the LEPC. The CCFCA initiative, funded from the county budget, has so far produced one of the three vehicles needed; this vehicle was provided by a facility. The LEPC hopes that county facilities will provide the two additional vehicles, otherwise, school buses may be converted for response use. In addition, a comprehensive mutual aid agreement, as well as SOPs for activation of mutual aid pact resources, are being developed between facilities and county fire departments to implement this initiative. Public Law 464 also requires contingency planning by all facilities that report under SARA Title III section 302. Facilities with extremely hazardous substances present in quantities above specified thresholds must submit a facility contingency plan to the local fire department, LEPC, and SERC. This plan, which must be exercised and reviewed annually, must address warning systems, transportation routes, employee training, and response procedures and equipment. Of the 22 facilities in Cumberland County that reported under section 302, 19 have already submitted contingency plans.

The three other businesses were sent a notice of noncompliance via registered mail; of these, two are currently in the process of preparing their plan. The last facility has not yet responded to successive notices, and the case will be handed over to the State Attorney General's office, through the Maine SERC, if action is not soon forthcoming.

Exercises. In conjunction with a local wastewater treatment training program, field demonstrations/exercises were held in 1985 and 1986 that increased local awareness of preparedness and response issues before the passage of Title III. Prior to the recent incidents, the LEPC held a table-top exercise simulating a hazardous materials accident at a fixed facility; the exercise focused on the establishment and staffing of an incident command post.

Although it posed a different scenario than that of the two transportation-related accidents, the exercise, by sponsoring direct communication among all county response organizations, helped to clarify the roles and responsibilities of command post staff, which proved extremely beneficial during the actual responses.

Training. The LEPC established a four-hour hazardous materials identification and recognition course for its members and all emergency responders. A 24-hour course is under development to meet the requirements of section 126 of SARA, which requires local emergency responders to be provided with training in understanding chemical hazards and proper safety procedures. In addition, a management-level course for public officials on hazardous materials incident command is being developed. The LEPC is also identifying a core of response personnel to receive hazardous materials team training. These responders will man the new emergency response vehicles as they become available.

LESSONS LEARNED

Face-to-Face Contact Between the LEPC and Industry Crucial. The LEPC believes that face-to-face contact between the LEPC and industry officials is the most important feature of Title III activities. Above and beyond the completion of an emergency response plan, the planning process is a most effective means of promoting interaction and awareness among local government and private industry. In addition, the preparedness process has been further strengthened by interaction between these individuals at field exercises and other initiatives (e.g., the response vehicle project), as well as at actual response incidents. The opportunity for the exchange of ideas, concerns, and suggestions provided both formally and informally by the LEPC structure and its activities remains the critical element in the success of an emergency preparedness and response program. Community and facility officials are better able to interact and respond to an emergency situation when the planning process has already established mutual respect and understanding.

Evacuation Coordination Meetings: Short but Effective. Following upon its response experiences, the LEPC strongly believes that if the nature of an incident permits (i.e., time and risk considerations are less stringent), a conference between fire, police, EMS, and other involved officials prior to the evacuation can be extremely helpful.

In just a few minutes, these response personnel can make specific determinations on who will be evacuated and where and how far they will be evacuated, as well as identifying where traffic control officers should be located or traffic barriers should be established. Such a procedure will insure that all evacuation participants are familiar with the evacuation and sheltering plan, and that response and evacuation activities are coordinated to eliminate potential conflicts.

WYANDOTTE COUNTY, KANSAS

LEPC Profile

LEPC: 21 members (elected and other local officials, and representatives of police, fire, emergency medical, civil defense, environmental, and public health agencies, as well as industry, community groups, and the media; chairman: Kansas City-Wyandotte County Health Department Director)
Population: 200,000
Facilities: Approximately 55 under section 302 and 100 under section 311-12, including soap and detergent and automobile manufacturing plants, and chemical processing facilities
Topics: Hazards Analysis, Planning, Compliance, Data Management, Inter-LEPC Coordination, Public Alert Systems

Wyandotte County is a heavily industrialized and densely populated county that includes Kansas City, Kansas, the second largest city in Kansas with a population of 160,000.

The county was selected by the Kansas SERC as the urban counterpart to rural Washington County when it developed model emergency plans as guidance for LEPCs in Kansas.

Numerous transportation routes, including Interstate Highways 35, 70, 435, and 635 and several major railroad routes, pass through the county. Wyandotte County borders on the intersection of the Kansas and Missouri Rivers, and lies across the state line from Kansas City, Missouri.

LEPC ACTIVITIES

Hazards Analysis. The county air pollution control program initiated a hazards survey under EPA's voluntary Chemical Emergency Preparedness Program (CEPP), the predecessor to Title III.

This survey was designed to determine which facilities in the county handled materials on EPA's list of acutely toxic chemicals, which were later designated as extremely hazardous substances (EHSs) under Title III.

Every facility in the county was sent a comprehensive survey based on EPA's CEPP: Interim Guidance.

If the facility indicated that one or more of these toxic chemicals were present, they were asked to supply further information on quantity and location of storage and use.

The survey produced a very sizable response from local facilities, and using the Technical Guidance for Hazards Analysis, a joint publication of EPA, FEMA, and DOT, the LEPC determined quantities of concern for the chemicals present in the community.

Because its limited resources could not support a full-scale effort, the LEPC ranked facilities based on the amount of the toxic chemical on-site and identified 20 facilities that had at least 1,000 times the quantity of concern for one or more chemicals.

A second tier of facilities with a smaller multiple of the quantity of concern were to be addressed in the second phase of the program. In this fashion, the ranking reflected not only the raw quantity of acutely toxic chemicals present at a facility, but also the relative health and safety threat that a release might pose to the surrounding community.

The LEPC met with the top 20 facilities and provided them with relevant portions of the Hazardous Materials Emergency Planning Guide (NRT-1), a document to assist LEPCs in preparing and reviewing emergency plans produced by the National Response Team, the organization consisting of the 14 federal agencies with oil and hazardous materials expertise.

The LEPC asked these facilities to prepare a hazards analysis for all of the identified EHSs that presented a significant threat to people or property beyond the facility perimeter. The LEPC also distributed copies of:

- Technical Guidance for Hazards Analysis along with a worksheet the LEPC developed to assist in vulnerability zone calculations;
- EPA chemical profiles on identified EHSs; and
- Response Information Data Sheets, which are similar to Material Safety Data Sheets (MSDSs), but more heavily emphasize emergency fire response information for the various chemicals.

Each facility was asked to complete a facility resources questionnaire as well as the hazards analysis matrix recommended in NRT-1. The LEPC set up a team to assist facilities, but placed most of the analytical burden on facilities for several reasons:

- LEPC resources were extremely limited;
- Facilities were more likely to have the technical expertise; and
- Facility operators would give much more credibility to the analyses if they did them themselves.

Planning. The Fire Prevention section of the fire department reviews the survey submissions and other facility information (e.g., information obtained from previous inspections and hazards analyses) to determine if a fire permit will be required under the Uniform Fire Code.

In addition, businesses whose responses indicate an extra hazard potential are identified in fire department records with an orange or red warning flag, which focuses emergency planning efforts on these facilities.

Information on the warning flags is forwarded immediately to the Hazmat Unit and all dispatchers to promote safer emergency response activity. The fire department will inspect flagged facilities and all other businesses handling hazardous materials to confirm the hazard information.

In addition, the Hazmat Unit will work with red- and orange-flagged businesses to pre-plan for an emergency response situation, develop a working knowledge of the facility, and collect information to perform hazards analyses.

The LEPC developed an innovative system known as Hazard Incident Complexity Analysis (RICA) to evaluate and rank geographical quadrants within the community according to their specific combinations of special hazard and vulnerability factors.

This analysis helps determine whether emergency response resources within a quadrant are commensurate with its hazard and vulnerability potential.

Although the Hazardous Materials Emergency Planning Guide provides a methodology for performing such an analysis, the LEPC did not have sufficient personnel resources to carry out this more complex procedure.

As a result, the LEPC decided to rely on RICA, a highly qualitative evaluation of the chemical hazards in the community. The RICA method took advantage of readily available LEPC resources, enabling useful analysis to be accomplished in a fraction of the time of more conventional methods.

In April 1988, the RICA workgroup, representing fire, health, police, public works, railroads, and civil defense, divided Wyandotte County into 2.6 square mile quadrants or portions of quadrants.

During a single, day-long session the workgroup developed a numerical hazard incident complexity ranking value for every quadrant within the community based on information from prior Title III activities (e.g., hazards analyses and inspections) and personal experience.

This evaluation considered 13 separate factors such as transportation corridors; the location of hazardous and toxic chemical users, manufacturers, and storage facilities; population density; traffic routes; institutions such as hospitals, nursing homes, day-care centers, senior citizen complexes, and schools; and geographic features.

The analysis produced a number from zero (the lowest value) to 100 (highest), representing an initial judgment by local officials concerning the relative likelihood of incident complexity and the availability of resources that may be needed to manage an incident for each quadrant.

Compliance. The LEPC believes that many facilities affected by Title III are not aware of its requirements, and instituted a comprehensive compliance program to reach these facilities in 1989.

The compliance program was a multi-faceted effort designed: (1) to obtain information essential to firefighter safety, the community, and businesses with hazardous materials; (2) to alert businesses to the necessity of obtaining fire department permits; (3) to inform businesses about the requirements of local, state, and federal law on hazardous materials reporting; and (4) to serve as the first step in the development of a system to insure that critical hazards information is readily available to first responders. The county is also planning to use the newly adopted Uniform Fire Code, which specifies more than 40 categories of activities that require permits, as an additional compliance tool.

The county included a notice on Title III with the 1989 annual business tax bills to 4200 businesses and individuals with occupational licenses.

The notice simply stated that the business might be subject to Title III, gave them a phone number to call for more information, and alerted them to expect a package of materials from the county.

This package included a cover letter, fact sheets on reporting requirements, and a screening survey on hazardous materials.

The survey questions addressed the development of facility contingency plans and OSHA hazard communication programs, as well as the use, production, storage, handling and reporting of hazardous materials, including:

- explosives;
- flammable liquids and other combustible products;
- poisonous, infectious, radioactive, or corrosive substances; and
- toxic chemicals.

The LEPC cross-checks the survey information against the data reported under Title III to insure compliance. Although the screening survey is quite comprehensive, it includes the option of requesting additional information, rather than providing a specific answer, to avoid intimidating potential respondents and support outreach to businesses unfamiliar with Title III.

Data Management. As with many other LEPCs, Wyandotte County has confronted the problem of incompatible computer systems; fire departments have or are getting Macintoshes to run CAMEO (Computer-Aided Management of Emergency Operations), but county and state governments have IBM-compatible mainframe systems and personal computers.

At the same time, the LEPC is trying to develop a data management system that will encompass all the Title III information it receives and simultaneously meet all three facets of Title III: community right-to-know, contingency planning, and emergency response.

The immediate solution to the data management problem has been provided by the Chemical Data Management Unit of the Kansas Right-to-Know (RTK) program. Wyandotte County was the first LEPC to take advantage of a new data transfer service provided by the Kansas SERC that allows Tier II information contained in the state RTK database to be imported into CAMEO.

The program became operational in early 1990; the time required to perform the transfer is primarily a function of the amount of data being converted, which in the case of industrialized Wyandotte County was substantial.

The program first converts the existing database records into dBase III+ files, then transfers the dBase III+ files into

Macintosh files using the MacLink utility, and finally imports the data into CAMEO.

For the long term, in summer 1990, Wyandotte County will be testing CAMEO II - DOS, the updated version of CAMEO designed for IBM-compatible computers that has recently been developed.

Inter-LEPC Coordination. Representatives from all the municipal and county LEPCs in the area attend regular coordination meetings sponsored by the Mid-America Regional Council, which serves as a metropolitan planning agency spanning the Kansas Cities and their environs.

A series of table-top exercises have been conducted involving response organizations on both sides of the state line.

Until recently, Wyandotte County possessed the only fully equipped (Level A) hazardous materials response team in the interstate metropolitan area, and thus responded to all major hazardous materials incidents, whether in Kansas or in Missouri.

An accident during a response in Kansas City, Missouri, in November of 1988 led to a voter referendum which raised sales taxes to fund a separate hazmat team for the city.

Public Alert Systems. Largely because of difficulties in rapidly and effectively alerting and informing the public during two actual hazmat incidents, the LEPC is involved in two public alert initiatives.

The LEPC has supported the introduction of chemical hazard incidents into the tone-activated radio weather alert system sponsored by the National Weather Service (NWS).

When an emergency is reported to the fire department, the dispatcher calls the NWS, which confirms the event and then activates the radio alert system, consisting of tone-activated radios, which broadcast the NWS emergency message to locations in every major media (i.e., radio and television) office.

In concert with local media, the LEPC developed a Chemical Watch and Chemical Warning declaration system. In the past two years, three incidents have produced Chemical Watch conditions, involving regular radio and television updates on events that might have produced a serious threat to public health, such as an overturned tanker truck.

Because the terminology and triggering circumstances are very similar to those for tornado hazards, the LEPC has been able to piggyback onto extensive tornado public education efforts.

In addition, actual experience has shown that there is often no time to evacuate people during a hazardous materials event.

Unless a long-term release is anticipated, in-place protection can prevent individuals from coming into direct contact with hazardous materials during their evacuation, which may not precede the arrival of a toxic cloud by a sufficient time span.

As a result, the LEPC has participated in several conferences to learn more about in-place protection as an alternative to evacuation. This knowledge will be used in concert with the Chemical Watch and Chemical Warning system to provide timely information to individuals within the area of a hazardous materials incident on how to remain safely in their homes and businesses.

LESSONS LEARNED

More Detailed Reporting Information Supports Emergency Planning. During the development of hazards analyses in conjunction with facilities, the LEPC recognized that it needed the chemical-specific data contained on Tier II forms instead of the general hazard category data required by Tier I.

In addition, the LEPC determined that the ranges for chemical quantities provided inadequate data for planning and response, and recommends that LEPCs require facilities to provide actual quantities.

As a result, Wyandotte County now strongly requests Tier II information and more exact quantity information (the actual value for the maximum quantity of a chemical on-site) from facilities.

Hazards Analyses Support More than Just Emergency Planning. The hazards analysis task served as a means of introduction and reinforcement of the chemical emergency preparedness and prevention message, educating facility personnel on the specific hazards posed by the EHSs at their facility.

In addition, the process introduced facility owners and operators to a new factor in determining the quantity of material stored at the facility, one which did not rely solely on the lowest per-unit cost for purchase and storage, but instead took into account the health threat (and potential liability) posed by larger quantities of hazardous materials.

Some facilities have already started to identify ways to reduce the quantities of hazardous chemicals stored on-site; others have decided that they should eliminate their on-site storage of certain hazardous chemicals.

After working with the facilities, the LEPC modified the hazards analysis matrix to include a comments column to give facilities the opportunity to explain why they must store larger quantities, indicate their past safety record with the material, or provide any additional information that the facility considers relevant.

Rapid Communication of Hazard Information to Responders is Essential. The November 29, 1988, accident in Kansas City, Missouri, led the Wyandotte County LEPC to expand responder safety efforts.

In the accident, six fire-fighters were killed when they responded to a fire at a highway construction site where almost 50,000 pounds of explosives were stored in an unmarked trailer.

In Wyandotte County, red or orange flags from the compliance survey now help to direct appropriate response personnel to an emergency incident. When a chemical-related emergency is reported at a red-flagged facility, the county hazmat team is automatically dispatched; if the facility is orange-flagged, the responding units are immediately notified, and the hazmat team is placed on alert.

A second approach adopted in Kansas City and just now being implemented is a uniform law requiring placarding of fixed facilities similar to the placarding required on trucks carrying hazardous materials.

Such placarding can serve as a safety net if the other systems prove insufficient, alerting responders "at the gate" to which materials are present on-site and thus reducing the likelihood of unknown hazards threatening the lives of responders.

In doing so, the community adopted the National Fire Protection Association Standard 704 placarding system, in addition to the requirement that the United Nations number, a unique international identification number for each hazardous substance, also be displayed.

Public Alert Systems Critical in an Emergency. With the experience of two hazardous materials incidents, it has become apparent that public alert systems play an important role in a successful emergency response.

The Wyandotte County LEPC has taken advantage of existing notification systems to develop a two-fold chemical emergency alert system, which is readily comprehensible to people very familiar with the dangers posed by weather emergencies such as tornadoes.

In addition, sheltering and evacuation planning must take into account that there is often very little time to perform an evacuation, and that individuals may not leave homes and businesses until the threat is upon them, or even after the emergency has passed.

With this in mind, the LEPC regards in-place protection and requisite public education efforts as an integral part of future Title III activities.

Data Management Must Address Compatibility Issues. The incompatibility of DOS and Macintosh data management systems has been a continuing concern of state and local Title III officials nationally.

In Wyandotte County, this problem has been addressed in the short run by the development of a system for data transference by the Kansas SERC.

In the long run, the LEPC anticipates that CAMEO II-DOS will finally solve most of the computer compatibility problems that have plagued fire departments and LEPCs, but until its development is complete, LEPCs and fire departments should consider the advantages of the data transferal option.

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

State of Ohio; Hamilton County, Ohio; Wallingford, Connecticut; Ouachita Parish, Louisiana

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve. Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices - for example, planning, compliance, information management, hazard analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed at the upper right hand corner of the first page of the profile for easy reference.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

SERC Profile

SERC Membership: 19 members, including representatives from the Departments of Health and Industrial Relations; Attorney General's and State Fire Marshall's Offices; Emergency Management Agency; Environmental Protection Agency; Industrial, Public Utilities, and State and Local Government Commissions; the State House and Senate; industry and trade associations; environmental groups; county commissioner's association; three fire service associations; and an elected municipal official; chaired by the Ohio EPA

State Characteristics: 87 LEPCs, 86 are single-county districts and one is a two-county district

Topics: Planning, Data Management, Outreach, Funding, Section 313 Implementation

Executive Order 87-16 established the Ohio SERC on April 15, 1987, and the SERC has established five subcommittees: executive, planning and exercises, procedural rules, training, and LEPC membership. Ohio Substitute Senate Bill 367, which became effective December 14, 1988, establishes chemical emergency preparedness and prevention activities to support implementation of the Emergency Planning and Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986). There are also local right-to-know laws, subject to grandfather clauses in the state law, in the communities of Akron, Cleveland, Cincinnati, Canton, Lancaster, Kent, Morwood, Oregon, Toledo, and Columbus.

SERC ACTIVITIES

Planning. The Ohio Emergency Management Agency (EMA) is responsible for the review of local emergency response plans. Plans are submitted to Ohio EMA, which formally reports its evaluation and comments to the SERC. Ohio Code requires that a plan must be designated as deficient if any of the thirteen state planning requirements are not addressed.

These requirements were adopted and expanded by the state of Ohio from the National Response Team's Hazardous Materials Emergency Planning Guide (NRT-1) and elements of Title Ill.

Ohio EMA prepared a Guidance for Submitting Plans and Updates to assist LEPCs by identifying what needs to be submitted for initial plans, updates, and the correction of deficient plans, as well as who must receive a copy of these materials.

Ohio EMA presented nine training sessions in August and September of 1990 on hazards analysis based on the EP AJFEMA/DOT Technical Guidance for Hazards Analysis, the Computer-Aided Management of Emergency Operations (CAMEO) software system, and the IBM-compatible Automated Resource for Chemical Hazard Incident Evaluation (ARCHIE) software system to assist local emergency planners in the preparation of plans.

Ohio EMA conducts its review of local plans using NRT-1 and a Hazardous Materials Plan Cross Reference, which Ohio EMA developed directly fromNRT-1. The Cross Reference is an outline which the LEPC is requested to submit along with its plan. It identifies the location of the planning elements and considerations listed in NRT-1, which were adopted as guidelines by the SERC, within the plan itself.

The Cross Reference thus serves as an indexed checklist for the reviewers of the essential plan components, and assists the LEPC in developing their Title III plan. Ohio EMA also uses this detailed Cross Reference to comment on planning elements during plan review.

State planning and exercise rules require each Ohio LEPC to carry out three exercises within each three year period, including at least one full-scale and two table-top, functional, or full-scale exercises. LEPCs must submit a notification to the SERC and Ohio EMA thirty days prior to any hazardous materials exercise.

A form has been developed to simplify this procedure for the LEPCs and to assist the SERC in evaluating the exercise. The SERC, through Ohio EMA, has designated five planners to assist the state's 87 LEPCs. Ohio EMA has provided exercise facilitator training for the state agencies who will evaluate LEPC exercises for the SERC.

The Ohio Revised Code also required the Ohio SERC to prepare a separate hazardous materials emergency plan for the state; the plan as compiled by Ohio EMA identifies responsibilities for 26 Ohio agencies in the event of a hazardous materials event.

Ohio EMA developed and then conducted a functional exercise to evaluate the state plan on August 1, 1990. The state exercise was a joint exercise with all state agencies located at the Ohio EMA offices, as well as the Montgomery/Oreene County/Miami Valley LEPC and the Monsanto Agricultural Company at the Monsanto plant in Dayton, Ohio.

Data Management. Ohio EPA is responsible for Title III data management under state law. Ohio EPA's Division of Emergency and Remedial Response is responsible for collecting and maintaining sections 302, 304, and 311-312 information. The state recommends the submission of chemical lists instead of MSDSs if more than ten chemicals are being reported. The state also requires Tier II information under section 312.

The SERC developed and adopted a more comprehensive industry reporting form for sections 311 and 312 submissions. A facility identification form requests data on the facility's latitude and longitude,' state permit numbers, number of employees, and phone number of the local fire department.

The revised Ohio sections 311-312 form requests specific storage locations (i.e., floor and sector of the building) of the on-site hazardous chemicals. Ohio also requires a facility map which correlates to the information submitted on the state sections 311-312 form.

Outreach. In order to maintain the critical ties between state and local Title III entities, the SERC is planning to develop a technical assistance and guidance program for LEPCs. The program would develop a series of guidance manuals and cassette tapes on selected Title III topics - What is Title Ill, Starting an LEPC, Role of Elected Officials in Title III, Role of LEPC Members - to support a more consistent and coordinated Title III effort state-wide.

The materials would be distributed to the LEPCs and would enable new LEPC members to get up to speed more quickly and clarify questions for existing LEPC members. Finally, the SERC has developed a training and outreach program for LEPC members on achieving Title III compliance that is to be presented at five locations in Ohio during September of 1990.

Funding. Ohio's enabling legislation provides a flat fee of $50 for facilities which have no EHSs, no more than ten hazardous chemicals, and less than 500,000 pounds or 74,000 gallons of hazardous chemicals.

A fee of $75 plus $5 for every hazardous chemical beyond ten up to a maximum of $2,500 is charged to all other facilities. Oil and gas extracting companies are charged $10 dollars per tank battery storage location over thirty-five, with a cap of $700. In addition, there is a 15 percent late fee for filing past the section 312 deadline.

These fees are submitted to Ohio EPA and deposited in a state Right-to-Know grant fund- $328,000 during 1989 and $692,000 during 1990.

State law requires that 15 to 25 percent be provided to state agencies on the SERC, 60 to 75 percent be handed out as grants for LEPC activities, and 5 to 15 percent be provided as grants for first responder training -- these training funds are to be coordinated between the fire department and their county-designated LEPC. The state legislature appropriated approximately $580,000 from July 1, 1987, to June 31, 1990, from general revenues for Ohio EPA to fund the operations of the SERC.

TOXIC RELEASE INVENTORY PROGRAM

Section 313 Implementation. S.B. 367 authorized the establishment of the Ohio Section 313 Toxic Release Inventory (TRI) program. The law gave Ohio EPA the authority to pass rules necessary to enforce section 313 consistent with federal regulations, to collect filing fees which will support the administration of the program, and to collect civil and criminal penalties from facilities and individuals failing to report or falsifying data.

Thirteen rules were developed by Ohio EP A's Division of Air Pollution Control (DAPC), and were effective as of June 22, 1989.

TRI data for reporting years 1987 and 1988 are already in the state database; reporting year 1989 data are currently being entered and should be complete by the fall of 1990. Ohio EPA received over 5,900 forms from over 1,500 companies in 1990.

A formal policy has been created to fulfill public requests for this information. Written requests are filled within 10 working days, except in the case of large requests, which may require more time. The standard copying fee of $0.20/page will be charged, although computer-generated reports are provided free of charge. The TRI data files are also available for public inspection, under supervision, during normal business hours - appointments can also be made upon request. A section 313 network has been established comprised of representatives from each Ohio EPA division and the Ohio Department of Health to provide a forum for addressing TRI right-to-know issues.

The network reviews the concerns of citizens and identifies which forms are being requested by the public. During the announcement of the initial availability of the TRI database, the network met primarily to discuss public information requests from citizens and public interest groups; at the present time, the emphasis is shifting to maximizing effective use of TRI data by state agencies, such as for prioritizing air toxics and ground water quality activities and in preparing grant applications.

The primary concern of the DAPC at this time is enforcing compliance with section 313. Ohio DAPC and Resource Conservation and Recovery Act (RCRA) permit-holders have been sent information on section 313 and a section 313 survey, which upon completion becomes part of the facility's file.

Ohio EPA has co-sponsored three seminars with the US EPA Regional Office for industry on the section 313 reporting requirements. At the request of trade and professional organizations, Ohio EPA has also participated in section 313 workshops to provide information to the regulated community.

The Form R report serves as the starting point for the compliance and enforcement initiatives. First, every section 313 submission is reviewed for completeness. This administrative review focuses on clerical reporting errors, and notices are sent to those facilities submitting incomplete reports.

The second phase is a review of the accuracy of the forms - current air permit records and RCRA generator lists are cross-referenced with section 313 reports to evaluate the accuracy of the release estimates. Once again, facilities will be contacted if questions arise concerning their estimations. The third element in the program is a series of section 313 audits of reporting facilities. Select facilities are audited to review how Form Rs were completed and how release estimates were calculated. The enforcement initiative also includes an inspection program for non-reporting facilities. Facilities have been identified primarily from RCRA and air permitting records, although DAPC is coordinating with other Ohio EPA divisions to identify further non-reporting facilities. The facilities first receive a written notice of inspection, approximately two weeks before an inspection.

Inspections (30 have been conducted) and subsequent legal enforcement action (seven have been initiated) will be carried out if necessary. DAPC personnel have also visited paint manufacturers to insure that MSDS information is being prepared and provided to their customers as required under the section 313 supplier notification requirements.

Under the Ohio Code, the owner or operator of a facility is liable for civil penalties of up to $25,000 per day for non-compliance with section 313. In order to insure consistent enforcement, Ohio EPA has developed a formal policy detailing various options for dealing with these facilities, including issuance of a compliance order or requesting action from city, county, or state prosecutors. In addition, Ohio EPA has developed distinct enforcement alternatives for each type of violation: late reporting (following a one-month grace period), administrative (clerical) errors, technical (release estimation) errors, filing false information, and supplier notification (identifying the presence of a toxic chemical in a mixture, its concentration, and the relationship to section 313 reporting obligations). DAPC section 313 activities became self-sufficient with the implementation of filing fees in fiscal year 1990. The program is now fully funded by a fee system which provides a staff of two engineers, one clerical position, and one intern for data entry. Each facility reporting under section 313 is required to submit $50 plus $15 per Form R submitted, not to exceed $500 per facility. There is also a 15 percent late fee for facilities which submit after expiration of a 30-day grace period.

In 1988, Ohio EPA had $65,000 to implement the program. For fiscal year 1989, the program was budgeted $65,000 and over $160,000 in filing fees was collected for 1989 reporting. It is ·estimated that $150,000 will be generated through the filing fees in fiscal year 1990.

LESSONS LEARNED

It's Not Over. The SERC is developing a number of projects for the near future to re-establish important connections and dialogue between itself and Ohio LEPCs. In the first days after Title III was passed, there was considerable enthusiasm in the state for the new program, but this has since diminished due to funding difficulties. The SERC hopes to develop an LEPC recognition program to support and encourage increased Title III activities and to serve as a method to publicize LEPC efforts within the state.

Effective Outreach Creates a Positive Atmosphere. The Division of Air Pollution Control at Ohio EPA has made a concerted effort to maintain a high level of outreach to facilities subject to reporting under section 313. By contacting facilities that received Ohio air and RCRA permits, the DAPC was able to identify a number of smaller facilities previously unaware of the requirements of section 313, and survey them to identify which of these facilities were obligated to submit Form Rs.

In addition, the DAPC annually contacts facilities who have filed under section 313 during the previous years to remind them of the reporting requirements. This effort has produced a positive environment in which the Ohio EPA is viewed as helping facilities comply with Title III, rather than simply enforcing penalties.

HAMILTON COUNTY, OHIO

LEPC Profile

LEPC: 35 full-time appointed members and 70 volunteers, including representatives from local .government, law enforcement, emergency management, local fire departments, first responders, health organizations, hospitals, local environmental and community groups, transportation, Red Cross, and covered facilities, who provide expertise for the various LEPC subcommittees

Population: 850,000

Facilities: 130 facilities reported for section 302 including large chemical manufacturers and small gas stations

Topics: Hazards Analysis, Planning, Exercises, Data Management, Outreach, LEPC Organization, Prevention, Compliance

Hamilton County is located in southwestern Ohio and borders the states of Kentucky and Indiana; The county is composed of 49 separate political jurisdictions, including the city of Cincinnati, and contains many major transportation routes including several interstate highways, major railroad systems, and the Ohio River. The LEPC has formed eight subcommittees to handle the following subject areas: plan oversight, hazard analysis, training, hazardous materials exercises, technical interpretation, data management, public and media relations, and membership nominations. Each subcommittee fulfills its responsibilities utilizing experts drawn from ~he community applicable to the subject area; for example, a representative from the local television station serves on the public and media relations subcommittee.

LEPC ACTIVITIES

Hazards Analysis. The LEPC decided a detailed hazard assessment of the chemicals, particularly extremely hazardous substances (EHSs), was necessary to provide a focus for emergency planning in the community. A technically-oriented LEPC subcommittee was assigned the task of identifying facilities and substances that posed the most serious threat to the community. This assessment will serve as the primary means for the LEPC to revise its emergency plan annually. Section 302 reports indicated that 130 facilities in the county use EHSs, and the LEPC sent these facilities a comprehensive survey which requested information on facility location, emergency notification and communications systems, emergency equipment and personnel resources, chemical-specific storage and transport, spill prevention and control, hazardous waste management, and contingency planning. As this information was being collected, the subcommittee decided to focus the hazard assessment on a small list of chemicals rather than on the entire EHS list so that emergency planning could address the hazards most immediately dangerous to the community.

The list was narrowed based on each substance's physical state, acute toxicity, reactivity, and explosive potential. For example, compressed gases and volatile liquids were considered more .hazardous to the community than inert solids. In addition, hazardous chemicals subject to sections 311-312 reporting were also evaluated to determine if some were as hazardous and also needed to be included.

Principal factors in this decision were a National Institute of Occupational Safety and Health (NIOSH) Immediately Dangerous to Life and Health (IDLH) level at or below 100 ppm and spill records from EPA's Acute Hazardous Events Database. This screening of EHSs and other hazardous chemicals produced a list of 85 substances, and after cross-checking with facility section 302 submissions, the subcommittee identified 74 facilities where 20 of these substances were present. The subcommittee then further reviewed these facilities' sections 311-312 submissions to identify the maximum and average range of the substances present on-site and to conduct preliminary dispersion modelling. This was done to identify 10 facilities of primary concern. These facilities serve as the initial phase of the program, which will be completed later this year. Upon completion, the subcommittee will begin to analyze the hazards posed by other facilities with significant quantities of EHS and other hazardous chemicals. In addition, the LEPC plans to begin work on hazards analysis for transport of hazardous chemicals in the near future.

As a pilot program, the subcommittee decided to request ten selected facilities to assist the LEPC in performing a detailed hazards analysis for these substances. A letter was sent to each facility along with a copy of the Technical Guidance for Hazards Analysis, requesting that the facility conduct the analysis pursuant to the authority of section 303(d)(3). The facilities were also provided with a simple worksheet for conducting a vulnerability zone and risk analysis for specified release scenario(s).

The results of the risk analysis section of the submitted worksheets indicated that some facilities had underestimated both the probability and severity of the potential release. (Even though the vulnerability zone analyses indicated that several facilities could potentially affect a ten-mile radius in populated areas, this was not reflected in the risk analyses.)

To correct this situation, the subcommittee developed a two-page risk analysis evaluation form to serve as the basis for a more quantitative estimate. The evaluation form asked a series of questions specifically designed to evaluate first the likelihood of an incident and secondly, the severity of the consequences. Each question was to be answered with one of three provided responses (i.e., choose A, B, or C). A certain number of points were assigned to each response. When totaled, the number of points corresponds to a scale which translates the number into a measure of the likelihood and severity of an incident. For example a score of 16-24 points in the "Likelihood of Incident'' portion of the form corresponds to a "Medium Likelihood" that the event will occur.

The questions pertaining to the likelihood of the event included areas such as contingency planning, storage facilities, monitoring and inspection procedures, history of leaks and spills, location of storage tanks, and employee hazardous materials awareness. The questions pertaining to the severity of the consequences covered areas such as the population within the vulnerable zone estimated by the facility, the capabilities of on-site and local response personnel, the anticipated property damage, and the expected environmental effects.

Planning. The Hamilton County Office of Emergency Management and Civil Defense is primarily responsible for coordinating the LEPC's planning efforts. This office had in place an approved Emergency Operations Plan (EOP), required by the Federal Emergency Management Agency, at the time of the enactment of the Emergency Planning and Community Right-to-Know Act (also known as Title III) and used it as the basis for the LEPC plan. The EOP was closely examined with respect to the Title III emergency plan requirements using the Hazardous Materials Emergency Planning Guide (also known as NRT-1), which was adopted as the LEPC's official planning guide. The planning efforts of the LEPC have also been assisted by Hamilton County's Disaster Planning and Coordinating Council. The Disaster Council, formed in 1962 under the auspices of Civil Defense, has provided first response and planning organizations a forum for the exchange of ideas, expertise, know ledge of resources, plans, and limitations· of each organization prior to a disaster.

The LEPC sent every facility that reported under section 302 and every local fire department with jurisdiction over a covered facility an extensive questionnaire requesting facility specific emergency planning information, such as emergency contacts, the jurisdictional police department, characteristics of the surrounding community, emergency response capabilities, and the names and quantities of the chemicals stored on-site. The questionnaire instructs the facility emergency coordinator to meet with the local fire department to jointly fill-out the information.

The questionnaire has proved successful in prompting initial and continued face-to-face contact between the facility, the local fire department, and the LEPC.

Exercises. The Hamilton County LEPC uses table-top, functional, and full-scale field exercises to test their emergency plan. A table-top exercise was conducted in January 1990 and consisted of examining a chemical release within the city limits of Cincinnati. Although the release was limited to the city boundaries, personnel from bordering counties also participated. The focus of this exercise was to test the basic provisions of the emergency plan: first responder coordination, communication procedures, and the roles of the different authorities involved.

The table-top exercise identified weaknesses in the existing plan that have since been corrected. Lines of emergency communication have been better defined for more effective information dissemination both during and following an incident. The precise roles of the different authorities involved in a response have also been better defined as a result of the exercise. Currently, a full-scale field exercise is being coordinated for May, 1991. The Monsanto Ports Plastics facility, in Addyston, Ohio, has volunteered to serve as the incident site. The exercise will involve a chemical release from a tank car into the Ohio River. Such an incident will require multi-jurisdictional coordination between various local emergency planning districts and will include the US Coast Guard. The exercise was formulated to test the mutual aid provisions of the emergency plan, the role of the LEPC in an emergency, and the coordination of emergency response personnel, and will involve local fire and police departments, local hospitals, and the media.

Data Management. The Hamilton County LEPC is examining various software packages for information management as well as creating their own programs to integrate and supplement the existing programs. Currently, the LEPC is using dBASE III plus on an IBM PS 2 to store information such as facility locations, facility emergency coordinators, and local fire departments, and CAMEO on a Macintosh II to store chemical information, such as sections 311-312 information. In order to evaluate their own progress and solicit suggestions for improved management of Title III data from other LEPCs, the Hamilton County LEPC sent a: questionnaire to every LEPC in Ohio. The responses from the LEPCs indicated a majority wanted more computer software and support. As a result, Hamilton County petitioned the SERC to increase its development of software and support for data management to LEPCs and to help fund seminars for state-wide training programs.

Outreach. The LEPC has distributed information to the public and community groups about the LEPC and Title Ill. Specifically, they have developed a three-page fact sheet describing the role of the LEPC, the information available under Title III, and the local emergency response plan. This fact sheet, US EPA documents, and a letter offering additional information and speakers was mailed to all community groups identified within Hamilton County. A series of newspaper articles was also published describing the LEPC and its activities. As a result of these efforts, the LEPC has received several requests for chemical information from the public. Some community groups also have identified facilities that may not be in compliance with Title III. For the future, the LEPC is creating presentation packages and a speaker's roster to be distributed to community and industry groups to improve awareness of Title III.

LEPC Organization. LEPC members are first officially recommended by the County Commissioner's Office and reviewed by the SERC for approval. The LEPC reviews and evaluates the performance of each LEPC member every two years. The purpose of the evaluation is to review the member's level of activity and commitment to the LEPC. At the end of this process, members are either recommended to be offered a continued membership or asked if they wish to resign their membership.

Prevention. Included in the planning questionnaire sent to facilities discussed in the planning section, is a very detailed self-evaluative prevention test for the facility. It includes areas such as alarm systems, chain of command information, equipment maintenance schedules, and other questions of similar nature. The check-list is intended to stimulate facilities' awareness of the need for chemical accident prevention. In the future, as resources and time permit, the LEPC wants to pursue more actively additional prevention initiatives.

Compliance. The LEPC has experienced a 90 percent compliance rate on the questionnaires that were mailed to the facilities. The universe of facilities that should be reporting has not yet been estimated. In order to identify facilities for both compliance and outreach efforts, each local fire department was sent a list of the facilities for which a questionnaire had been submitted to the LEPC. The local fire department was then asked to identify facilities in their jurisdictions that had not submitted a report. In addition, the state of Ohio has provided each LEPC with a list of all the permit-holding facilities, such as state and federal air and water discharge permits, in their emergency planning districts. Both the information from the local fire departments and the state of Ohio will be used to increase awareness of and compliance with Title III.

LESSON LEARNED

Broad Participation, Broad LEPC Capabilities. Prior to the enactment of Title III, there was no specified or required membership on an emergency planning team. As a result, many valuable representatives with valuable knowledge were left out of the planning process. The LEPC's hazard analysis subcommittee conducts a much more effective and efficient hazards analysis because its membership is very broad. The membership includes a toxicologist, facility representatives, a mechanical engineer, and first responders, as well as local planning officials. Toxicologists and health professionals can provide a clearer picture of the hazards posed by chemicals, and simplify prioritizing release scenarios. Response personnel can provide insight into previous incidents and the effort necessary to conduct a full-fledged response. Engineers and facility representatives can better assess the hazards associated with specific industrial processes and the value of prevention and mitigation systems.

In addition, the inclusion of industry members will improve facility cooperativeness with the process. In addition, many residents concerned about hazardous chemicals in their community have become active in the LEPC. Through working together on the LEPC, industry and residents have developed a cooperative, non-adversarial relationship. As a result, the emergency response plan resolves facility hazards and community concerns in a more responsive manner.

WALLINGFORD, CONNECTICUT

LEPC Profile

LEPC: 30 members, including elected officials; representatives from local fire, police, civil defense, utilities, and public works, as well as facilities reporting under sections 302 and 311-312; and the Red Cross and other community groups (chair: mayor; vice-chair: American Cyanamid plant manager)

Population: 41,000

Facilities: Large and small chemical companies and specialty metal Manufacturers

Topics: Planning, Exercises, Data Management, Hazards Analysis, Training, Outreach

Wallingford is located in New Haven County between New Haven and Hartford, Connecticut.

Heavily-traveled commercial Interstate Highway 91, a freight rail line, and the Quinnipiac River run through the area.

The Wallingford LEPC has established several subcommittees, such as Public Education and Educational Institutions, to address specific Title III issues.

LEPC ACTIVITIES

Planning. The Wallingford LEPC is in the process of completing its annual emergency response plan review. A current issue of concern is educational institutions -- what is the need for emergency planning for chemical incidents at these locations (e.g., lab or maintenance incidents) or from incidents in the surrounding neighborhoods which could affect a school. Local educational institutions have been participating in a special LEPC subcommittee on schools, which has addressed the integration of school contingency planning with the LEPC plan, particularly in reference to evacuation and in-place protection decisions. As a result of an incident in nearby New York State in the Spring of 1990, where a school wall collapsed during a violent storm, the LEPC has been exercising an extra degree of caution before making firm decisions on appropriate locations for sheltering school children.

Exercises. In conjunction with the local American Cyanamid facility, the LEPC held a full-scale exercise in 1989 which was attended by state and local officials as well as representatives from US EPA Region I. Because the facility and the local fire department had a long history of cooperation and coordination of preparedness activities, the exercise was designed to test the other branches of the community's response system -- primarily the police department and emergency medical services (EMS). The scenario featured a ruptured tank of aqueous ammonia, which produced a toxic cloud which was to pass over a primarily commercial and industrial area.

The police department was responsible for establishing roadblocks and conducting notification of potentially affected businesses of the need for in-place protection and/or evacuation. Police cruisers were dispatched to the areas in the path of the cloud, and were provided with index cards for a building representative to sign and indicate the time, so that the length of the operation could be estimated. In return, each building representative was provided with a statement that described evacuation and/or in-place protection options.

Meanwhile, emergency medical personnel treated and transported the "contaminated" victims to local hospitals via ambulances. During the in-depth critique of the exercise, the primary concern raised was with the proper decontamination of not only the victims, but also ambulances and hospital treatment areas. These issues have been addressed by revised EMS protocols, and the two local hospitals and the ambulance service have been in the forefront of the planning for an exercise later this year. This exercise, scheduled for October, 1990 at the Ametek facility, will also involve an ammonia release.

Data Management. The Wallingford Fire Department uses the Computer-Aided Management of Emergency Operations (CAMEO) software system, designed by US EPA and the National Oceanic and Atmospheric Administration (NOAA), to assist local emergency planners and responders with Title III activities. At this time, CAMEO provides Material Safety Data Sheet and storage location information on hazardous chemicals to the fire department and dispatcher. Tier I and Tier II information is accepted from facilities for emergency planning purposes and is available at the fire department, city hall, and the local library.

For emergency response, the LEPC has developed Chemical Information Inventories, which identify each hazardous substance by DOT class, Tier I form hazard class, Occupational Safety and Health Administration hazard categories, National Fire Protection Association section 704 labeling standards, and Paint Industry standards, in order to provide a comprehensive rating system for the hazards associated with each substance, and to identify the personal protective equipment needed during a response action.

Hazards Analysis. The LEPC has developed vulnerable zones using four separate methodologies- the National Response Team's Hazardous Materials Emergency Planning Guide (NRT-1), the Department of Transportation's Emergency Response Guidebook, CAMEO, and the ToxChem software system used by local chemical companies. The LEPC determined that the most dangerous release scenarios involved ten-mile radius zones of vulnerability, i.e., they could conceivably have impacts beyond the municipality of Wallingford. The hazards analysis has prompted prevention projects at local facilities, including moving storage tank locations, switching to less hazardous chemicals, and introducing engineering controls (such as improving the protection of tanks to prevent vehicles from backing into them and installing diking to contain a release or spill).

The LEPC has also been concerned with transportation incidents that could result in a release at a fixed facility. In 1981, for example, a train derailment almost resulted in a serious incident when a derailed car narrowly missed a collision with a. steel annealing furnace building which uses hydrogen and ammonia.

Training. Firefighter training on hazardous materials response is a priority in Wallingford. The entire Wallingford Fire Department, consisting of 60 paid and 150 volunteer firefighters, have been trained to "operational level," as regulated under SARA section 126, which requires local emergency responders to be provided with training in understanding chemical hazards and proper safety procedures. Sixteen firefighters have received additional training to qualify as hazmat technicians; four of these have been certified by the state after undergoing a 132-hour training program sponsored by the Connecticut Commission on Fire Prevention and Control, and receiving specific training with the hazardous substances in Wallingford.

The local American Cyanamid facility has a 7-member hazmat team which responds to incident involving Cyanamid products in much of southern New England. Recently, during a gasoline tanker truck roll-over incident, the· American Cyanamid in-plant fire brigade was called in to assist local firefighters in applying foam.

Outreach. The LEPC developed a citizen's brochure on Title III for distribution to all households in the community as part of an aggressive approach to educating the public on chemical emergency issues. The brochure provides specific information on how citizens can prepare for and respond to notification of an evacuation or in-place protection for a chemical emergency, including a map of the town showing major facilities, transportation routes, and schools for evacuation purposes. It also describes how citizens can get access to facility information under the right-to-know provisions of Title III and the Wallingford emergency response plan.

In 1989, the LEPC sent an information packet on Title III reporting requirements to 500 area businesses identified from various sources as likely to be subject to Title III. The LEPC believed that many smaller businesses might be unfamiliar with, or unaware of, the requirements of Title III. The mailing identified several new facilities subject to section 302, which have subsequently not only reported their extremely hazardous substances, but also joined the LEPC. This effort has also instigated a reevaluation of hazardous chemical policies at other facilities, and after this analysis, several facilities altered existing process and inventory procedures (e.g., by reducing on-site inventories), thereby reducing the risk to the community.

The Public Education subcommittee is developing an audio-visual program to assist LEPC members in making presentations to industry and other organizations on Title III and the role of the LEPC.

LESSONS LEARNED

LEPC Membership Should be Inclusive, Not Exclusive. Wallingford LEPC industry participation is not limited to those facilities that are involved in emergency planning under SARA section 302, but also includes several facilities that only report under sections 311 and 312, but nevertheless want to be involved in LEPC activities. The LEPC has established a number of ad-hoc subcommittees to serve as workgroups in addressing specific Title III issues, such as school contingency planning described above, and has invited organizations outside the LEPC to participate, such as the public school system.

Industry Can be an Equal Partner in Title Ill Activities. The LEPC believes that many emergency preparedness and prevention initiatives fail to recognize the important role that industry can play in fulfilling their objectives. Any past adversarial relationships between local government and industry must be replaced with communication to rebuild trust and thereby work to ensure the success of Title III efforts in the community.

In Wallingford, industry plays a major role by participating in the planning process and exercise development, by maintaining a fully-trained hazmat team and response equipment, and by distributing Title III-related literature. For example, the BYK-Chemie USA and Bristol Myers LEPC representatives drafted the materials for the 1989 outreach project to small businesses.

Furthermore, the Connecticut Emergency Resource Manual, published by the Connecticut Business and Industry Association in connection with the State Emergency Response Commission, serves as a means of quickly identifying response resources available at nearby facilities in the event of a hazardous materials incident. BYK-Chemie USA, Allegheny Ludlum Corporation, Ulbrich Stainless Steels, and American Cyanamid are represented on the Wallingford LEPC and have agreed to provide specific technical expertise and response equipment in this effort. Each has provided a list of available equipment and expertise, as well as a business and 24-hour phone number and an emergency contact for the manual, which has been distributed by the SERC to all Connecticut LEPCs and fire departments.

OUACHITA PARISH, LOUISIANA

LEPC: 18 members, including fire, law enforcement, toxicological, health, emergency management, and general services officials, Red Cross and media representatives, the Mayor of the parish seat, a State Senator and a representative, industry officials, attorneys, officials from State and Federal agencies, including the US Coast Guard, and representatives from the Lions Club and the Chamber of Commerce. The Chair is the Director of the Parish Civil Defense Agency.

Population: 142,000

Facilities: Approximately 215, ranging from chemical manufacturing companies to small businesses such as service stations, and to a number of farms and agricultural operations

Topics: LEPC Organization, Public Outreach, Data Management, Inter-jurisdictional Coordination

Located in the northeast part of Louisiana, Ouachita Parish is predominately agricultural, though about a third of its population lives in Monroe, the parish seat.

Significant contingency planning considerations include an interstate highway, a railroad line, and the navigable Ouachita River.

A fish preserve and two wildlife areas lie within the parish bounds, as does one of the nation's largest manufacturers of anhydrous ammonia, and two major anhydrous ammonia distributors. Also, a major paper factory is located there.

Given the amount of production and use of ammonia within the parish, the LEPC and the emergency response community have paid considerable attention to the possibility of an accidental release.

Transportation-related spills of ammonia have occurred several times in -recent years, and, indeed, two separate incidents involving barges on the Ouachita River have led to significant LEPC action and to the improvements of hazardous materials response operations throughout the parish.

LEPC ACTIVITIES

LEPC Organization. From its origin in September, 1987, the Ouachita Parish LEPC has been characterized by steady leadership, clear guidelines for LEPC members' involvement, and candor in its work.

Starting with an existing, well-developed all-hazards contingency plan, and relying on intensive orientation and training of all its members, the LEPC was able to move quickly towards accomplishing its assigned mandates.

At the committee's second meeting, objectives were discussed and agreed on, and operating procedures were adopted. Additionally, four standing subcommittees were formed:

- Information Management;
- Hazards Analysis;

- Capabilities Analysis; and
- Plan Review.

Continuing guidance has been given to subcommittee members in the form of brochures, articles, and specialized training sessions. With such a strong emphasis on organizational principles, the LEPC plan began to grow.

One major factor stands out in the success to date of the LEPC's working together: the members seem to realize that Title III depends on a slow, building process, requiring patience and persistence.

From the beginning, every LEPC member was given assignments, and was expected to join actively in the LEPC's continuing work.

The committee was able to finish and submit its draft contingency plan in September, 1988; the plan was incorporated as an annex to the Parish All-Hazard Plan.

The LEPC has functioned mostly on a volunteer basis. With the exception of computers purchased by the Police Jury (which is the Louisiana equivalent of a county commission) for the parish fire department, and state-level training for response personnel, no additional funds have been sought or spent to support the committee's work.

Public Outreach. Initially, in Ouachita Parish, there was little interest in chemical safety and the new era of Title Ill; natural disasters such as tornados formed the center of public concern.

Realizing that its ultimate success would depend in part on changing this attitude, the LEPC began public information work early in its existence. For example, media representatives were recruited and retained as committee members (indeed, at present, there are three).

First, arrangements were made with the local radio and television stations for public service announcements to be broadcast.

These brief messages outlined the new federal law, commented on the nature and presence of hazardous chemicals, and explained the existence of the new LEPC. Later on, interviews of the committee chair were set up, both on radio and television.

Two separate half-hour television programs were aired, explaining Title III and the local parish activities in detail.

In another approach, the Ouachita Parish LEPC prepared and sent informational letters to all the schools and civic organizations in the Parish, again, explaining the law and the importance of hazardous chemicals contingency planning.

Following up on the school letters, officers of the three parish fire departments developed and presented chemical safety programs to teachers and students.

Also, members of the LEPC presented similar offerings at civic club meetings. All this effort eventually led to the establishment of a separate public information subcommittee to plan a long-range educational effort.

To date, the high-point of this effort has been the LEPC's sponsorship of a Chemical Awareness Week, held parish-wide during the week of October 2-6, 1989.

The Chemical Awareness Campaign planning work began that summer, and the subcommittee drafted a brochure for distribution to households throughout the parish.

The campaign was based on the premise that since "society today is dependent on chemicals, it is important for people to be aware of precautions to take when accidents occur."

LEPC members prepared a "chemical releases" fact sheet for general distribution, summarizing all accidental chemical releases for the past five years.

While most of these incidents were minor, the sheet was meant to remind Parish residents that even in a relatively tranquil part of Louisiana, hazardous materials were not only present, but sometimes leaked, burned, or exploded, and threatened lives and the environment.

Also, members worked on a series of nine special public service announcements to be broadcast during the Chemical Safety Week. Ranging in length from fifteen to sixty seconds, these announcements concentrated on practical advice on what steps to take immediately following an accidental release.

They covered informal respiratory protection, in-place protection, and orderly evacuation. At the end of each announcement, the following sentence was read: "[T]his message from your Local Emergency Planning Committee."

Additionally, a three-page news release was prepared, explaining the intent of Title III, and detailing the history, purpose, and work of the LEPC.

Of special focus in the text was the announcement of the mailing of the brochure, What to Do in Case of a Chemical Emergency. Official support for the campaign was given by the parish and its two incorporated municipalities. Proclamations announcing the Chemical Awareness week were issued by the Mayors of Monroe and West Monroe, and by the Ouachita Parish Police Jury.

Each proclamation stressed the presence of hazardous chemicals, the need for the public to inform itself, and the work of the LEPC.

The Louisiana Power and Light Company underwrote the publication and mailing of the chemical emergency brochure. Accompanied by a letter from the LEPC, the brochure was mailed separately to all 68,000 customers of LP&L in the parish -- no cost was incurred by any governmental agency.

The letter urged residents to take a few minutes to read the material in order to increase their awareness of what to do in case of a chemical release.

What to Do in Case of a Chemical Emergency was printed in two colors on glossy paper. The text echoed the main points of the public service announcements:

- What if you are told to protect yourself from breathing hazardous chemicals?
- What if you are told to remain indoors for in-place protection?
- What if you are told to evacuate?
- What should you do if you know there is a release and it's coming toward you?

At a press conference held at the start of Chemical Awareness Week, LEPC members and local officials were joined by representatives of the US EPA and the State of Louisiana. It was noted that this campaign was the first of its kind to be organized in Region VI.

Shortly afterwards, the New Orleans LEPC used it as a model for its own campaign.

Currently, following up on the October, 1989 events, the LEPC is preparing a 1991 calendar containing chemical safety information for free distribution in the parish.

Also, members are preparing written material for distribution to all school children with the intention that the children will take the material home to their parents.

Further, the LEPC is producing a videotape for showings at public meetings.

Data Management. To better manage all the information gathered under Title III, the LEPC turned its attention to establishing a local repository agency, and to the acquisition of appropriate computers and software.

Accordingly, a special subcommittee was formed to draft specific procedures for the repository's operation.

Rules and reporting forms were drafted and presented to the LEPC for adoption.

The LEPC decided to mail copies of the adopted rules and forms to all facilities that had submitted Tier II forms previously in order to foster better understanding of the LEPC's expectations.

Reporting a release with the parish forms is voluntary, but the LEPC views the procedures as vital to its operation.

With help from the Louisiana State Police, the subcommittee completed its work, and the LEPC adopted its report without opposition.

Subsequently, the Ouachita Parish Fire Department was selected as the repository agency, with the concurrence of the two municipal fire departments.

The Parish Police Jury purchased IBM-compatible computers for use in managing the data, and the three departments began a coordinated effort to develop common information capabilities.

The LEPC continues to monitor the repository's operations, providing guidance whenever requested. In July, 1988, in order to ensure that the chemical reporting practices would be uniform throughout the parish, the LEPC sent an explanatory letter to facilities potentially subject to Title III requirements.

Enclosed with the letter were copies of the repository's operating rules regarding public access to facility submissions adopted by the LEPC. Also, the three LEPC reporting forms were enclosed:

1) Initial Release Report: to be filled out by fire personnel when an incident is called in. Facilities were instructed to notify the repository agency and the SERC, as well as the local fire department following an accidental release;
2) Chemical Information Request: to be completed by anyone asking for material under the community right-to-know provisions. A courtesy copy of this form is mailed to the facility in question; and
3) Repository Agency Query Letter: to be sent to facilities notifying them that information has been requested that is not on file, and that it must be supplied within 30 days.

The LEPC, concerned that it might be imprudent to allow the widespread dissemination of confidential chemical location information, agreed that such information would be kept sequestered unless facilities agreed to its release.

Also, concerned about the accuracy of the data collected under the various reporting requirements of Title III, the Ouachita LEPC began a process of annual cross-checks of data with the Louisiana State Police Right-to-Know Unit.

Repository agency personnel check current reports with those from prior years, and send notices to delinquent facilities and to those whose reports are questionable.

By April, 1990, the LEPC had decided to make a further improvement in its information management services. Having reviewed the East Baton Rouge/Exxon automated reporting system, the committee chose to adopt it for use throughout Ouachita Parish.

Free diskettes for Tier II filing requirements would be supplied to any owner or operator who requested them.

A memorandum was sent to facilities throughout the parish advising them of this time-saving offer, and announcing a series of training workshops for facility personnel; the floppy diskettes (requiring IBM-compatible PC's and software) are to be mailed annually to the repository agency.

The workshops last about one hour and were scheduled by appointment, starting with the parish's larger industries. This automated system is expected to ease the workload of the parish fire department considerably when fully implemented.

Inter-jurisdictional Coordination. In analyzing chemical incident responses, the committee noted the ever-present traffic of hazardous materials on the parish's interstate highway, the railway, and the Ouachita River.

In March, 1988, the LEPC organized an exercise simulating the leak of a chemical product from a truck in a parking lot in Monroe.

The written critique was generally favorable, but noted minor communications, coordination, and command problems: after all, several independent jurisdictions suddenly were forced to act together.

Just a little over a year later in April, 1989, the real thing happened, this time on the river as two barges carrying anhydrous ammonia ran into two separate bridges, resulting in a minor leak.

Initial inter-jurisdictional confusion hampered the response efforts.

Then, on August 10, 1989, another barge crashed into a river bridge releasing anhydrous ammonia gas into the air. This time, an evacuation was ordered, and the local newspaper featured a special story titled, "Anhydrous

Ammonia a Suffocating Killer," explaining the nature and hazards of the chemical.

The LEPC met to review this incident as the real test of its contingency plan and its training and exercising program.

A written report, prepared as the result of the meeting, concluded with ten recommendations to improve future response actions, as well as the contingency plan itself.

The final recommendation read as follows:

> "Consideration should be given to establishing a multi-agency HAZMAT Team, combining the equipment and trained personnel that already exists within the Parish ... "

The Ouachita LEPC agreed to serve as the forum for the study and consideration of a unified response approach. Initially, the committee organized a Hazardous Materials Task Force, composed of parish and municipal police and fire agencies, the State Police, and the Parish Civil Defense office.

The task force first met in August, 1989, and has been working together since then to develop guidelines, procedures, and criteria for response force membership and training (following the new OSHA regulations).

Several prospective members are qualified hazardous materials response instructors.

LEPC members are confident that their Task Force will soon grow into an effective operational team - a positive expression of continuing contingency planning and analysis.

LESSONS LEARNED

Money Alone Does Not Make Title III Work. Speaking for her LEPC, the chair has noted two keys to successful Title Ill implementation.

The first, in her words is "that money does not, will not, should not fix SARA Title III. If anything, money introduced into this program, except for training, will destroy what it is intended to do. Everyone who is by law involved in SARA Title Ill should do his part. No one should be able to pay someone to take his responsibility." As police, fire, and hospital personnel are learning, the objectives and activities of Title Ill are "part of what we are supposed to have been doing all along ..."

Success Involves Commitment, Patience, and Persistence. The second key lies in the understanding that chemical safety and contingency planning are long-range activities: there are few overnight successes; LEPC membership involves commitment, patience, and persistent effort in the "slow building process" towards full local knowledge and capability.

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SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Cameron County, Texas; Bucks County, Pennsylvania; Harford County, Maryland; Dallas County, Texas

ABOUT THIS BULLETIN

This is another in a series of bulletins EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SER Cs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices -- for example, planning, compliance, information management, hazard analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed at the upper right hand corner of the first page of the profile for easy reference.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

CAMERON COUNTY, TEXAS

LEPC Profile

LEPC: 19 members, including elected officials and health, police, emergency management, fire, emergency medical service, local hospital, industry, railroad, media, and chamber of commerce representatives.

Population: 125,000

Facilities: 59 reporting facilities, including distribution and warehousing facilities, fertilizer manufacturers, pesticide distributors, water treatment plants, gas stations, paint mixing suppliers, and transporters.

Topics: International Coordination, Training, Outreach, Compliance, Funding

Cameron County, Texas, is a primarily agricultural area with a large amount of tourism located at the southern tip of the state. Brownsville is the county's largest city and lies across the Rio Grande from the neighboring city of Matamoros, Tamaulipas, Mexico. Because of its proximity to the Gulf of Mexico, the Cameron County Local Emergency Planning Committee (LEPC) must prepare for off-shore response actions as well as land-based response actions. And because the county is on the Mexican border, the LEPC must be prepared for international coordination and communication in the event of an emergency on either side of the border. Cameron County has few chemical production facilities, but is home for a large import and export trade. For this reason, the LEPC is primarily concerned with the hazardous materials stored in warehouses in the area and transported through the county by rail or by truck on Highways 77 and 83.

LEPC ACTIVITIES

International Coordination. International emergency planning agreements between the United States and Mexico call for bilateral action to protect the border environment. These agreements emphasized the need for the Inland Joint Response Team (JRT) to support and assist sister cities located on the U.S./Mexico border in coordinating emergency preparedness and response.

The Cameron County LEPC has responded to these agreements by establishing close ties and coordinating emergency response plans with its Sister City of Matamoros. In particular, the LEPC has worked with a Committee Locale de Ayuda Mutua (CLAM) in Matamoros, the Mexican equivalent of an LEPC.

Representatives from the Quimica Fluor plant in neighboring Matamoros and the Cameron County LEPC chair agreed that a full-scale international exercise to test chemical emergency response capabilities along the border might be extremely beneficial to all persons involved. The first step in making the exercise a reality was in clearing the operation with federal, state, and local authorities from the U.S., as well as representative organizations on the Mexican side. After five months of extensive planning done exclusively by volunteers, the exercise "Operation Amigo" began.

Operation Amigo involved a staged chemical spill of sufficient toxicity to require the aid of the emergency response team at the Quimica Fluor plant in Matamoros. The exercise tested both international communication capabilities and the expediency of customs and immigration procedures for moving response personnel and equipment across the U.S./Mexico border.

The timely arrival of the Matamoros response team at the accident scene in Brownsville made the exercise a success. But Operation Amigo also exposed easily overlooked deficiencies in existing emergency plans, allowing participants to learn from their mistakes during a harmless exercise. For example:

- One of three hospitals in the area (thirty miles north of Brownsville) has remedied its lack of contamination suits by acquiring a number of contamination suits and a portable decontamination unit.
- EPA Headquarters found during the exercise that its computerized communication link could not access international numbers to contact Mexican authorities; the Agency has since rewritten the communication program to allow access to foreign countries in emergency situations.
- The Cameron County LEPC learned that they should have immediately contacted a representative from the Brownsville Irrigation District after a chemical accident occurs. The Brownsville Irrigation District pumps water from the nearby Rio Grande river via "resecas," or old river beds, to the water treatment facility. For this reason, drainage into the resecas during a chemical spill would seriously endanger the purity of the water supply if the pumping were to continue.

With the discovery of these shortcomings during the Operation Amigo exercise, improvements in the emergency plans could be made before an actual chemical accident occurs.

Due to the success of Operation Amigo, the LEPC took part in two conferences of note. On June 6 and 7, 1990, the U.S./Mexico Inland JRT Conference was held in Brownsville and was attended by officials from the fourteen sister cities, as well as federal and state representatives from the U.S. and Mexico. The conference highlighted both the problems of language, customs, and governmental structure for emergency response along the border, and the need to overcome such obstacles. Cooperation between the cities of Brownsville and Matamoros, particularly concerning Operation Amigo, was cited as a promising sign of effective joint inland response across international borders.

On July 24, 1990, members of both the Cameron County LEPC and the CLAM organizations were invited to attend the Latin America and Caribbean Training Seminar on the Awareness and Preparedness for Emergencies at Local Levels (APELL) in Metepec, Toluca, Mexico. The APELL program was developed in mid-1987 by the United Nations Environment Programme to foster coordinated emergency planning for chemical accidents throughout the world. Representatives from the LEPC and CLAM described Operation Amigo and their corresponding contributions to the Sister City program. The conference stressed the need for such cities to work together for chemical safety, and presented some of the more global issues in the chemical safety and emergency planning arenas. The chair of the Cameron County LEPC summed up the message of the conference by saying, "In emergency response we must see borders as joining two countries, not separating them."

Training. The Cameron County LEPC has succeeded in sparking public interest through offering free hazardous materials training. One of the first services performed by the LEPC was to ask the physician from the Matamoros Quimica Fluor facility to give a two-hour chemical accident awareness course to staff members from Cameron County hospitals. In June of 1989, EPA Region VI gave a two-day "First Responders" course, drawing 150 people from Brownsville/Matamoros and about 65 people from nearby Weslaco. The course described different chemical hazards and equipment, explained the uses of the CAMEO software system, outlined hazards analyses methods, and set up several table-top exercises for its participants.

Upon the request of the Cameron County LEPC, local industry joined in the move to offer hazardous materials training. Approximately 80 persons from local fire and police departments, emergency medical services, government agencies, and various industries attended a two-hour hazardous materials awareness course offered on two successive days by the Chemical Leaman company. Groendyke Trucking, a local shipping company, sponsored a two-hour preparation session for Operation Amigo between members of the Quimica Fluor Hazmat team and local police. In October 1990, Union Pacific also offered training for local police and emergency response units in emergency planning for mitigating rail accidents involving the transfer of chemicals; more than 50 people attended.

Outreach. The Cameron County LEPC hopes to improve their ability to communicate the Title III message to both local citizens and members of industry. The monthly LEPC meeting is open to the general public, including citizens of neighboring towns in Mexico. The LEPC sends out monthly announcements summarizing current information on LEPC issues to 200 local government, emergency medical service, industry, and Texas SERC representatives.

At the present time, the Cameron County LEPC meets on occasion with various clubs and community organizations for lunchtime presentations. Local print and television media provide coverage for some LEPC events, and the LEPC hopes to obtain free space to promote their activities in local phone books. The LEPC ultimately wants to get people involved on a more local level by having industry representatives meet with neighborhood associations to discuss their facilities' emergency plans. In this way, the LEPC believes residents will become more aware of emergency preparedness and the chemical hazards that exist in their own community.

The Cameron County LEPC is working to enlist the aid of the Texas Agricultural Extension Service to spread the emergency preparedness and response message to residents of the State of Texas. The extension service is based at Texas A&M and is funded through grants and contracts, as well as through the county, state, and federal government budgets. The LEPC has proposed that some members of the extension service be trained in emergency response procedures to better educate the public on what to do in case of a chemical emergency.

Compliance. Facilities are required under the Texas Hazard Communication Act to report Tier II information as outlined in section 312 of Title III. Compliance under the requirements of Title III and the Texas Hazard Communication Act has proven to be difficult to ascertain for the Cameron County LEPC.

Many companies that transport chemicals through and within the county do not report on the hazardous chemicals they store within the county, claiming that chemicals stored in their vehicles and warehouses are under active shipping papers and exempt under sections 302-303, and 311-313. However, at any given time, these chemicals may be either stored for days in warehouses or remain unmoved in tanker trucks.

The LEPC is contacting these companies to explain the Title III requirements and the spirit of the law. Letters have been sent to almost 200 warehouses and transportation companies in an attempt to identify the hazardous chemicals present on-site.

Funding. In the past, the Cameron County LEPC has received donations from local banks, hospitals, and industry for receptions during various training sessions and during the Operation Amigo exercise.

In addition, the LEPC has asked local businesses to help defray the cost of several other items such as a VCR for recording hazmat training cable broadcasts. Additional sources of funding consist of postage donated monthly by local industry and a small grant from a local foundation. The grant has allowed the LEPC to do more of the things they had wanted to do (e.g., Operation Amigo).

LESSONS LEARNED

Consistent Meetings Mean Continuous Outreach. Contact with the community is needed if emergency preparedness is to be on people's minds. Monthly meetings are very important; if the community gets into the habit of participating every month, emergency preparedness and response will remain a fresh subject for all those who participate.

Emergency Response Exercises Should be a Team Effort. Because members of the community respond to chemical accidents together, they should train together as well. On the day after Operation Amigo, for example, an evaluation of the exercise occurred in which each person who participated explained what he/she had learned to the entire group. In this way, people became aware of the different responsibilities and problems of different responders. All those involved learned that training and exercising together is the key to organized emergency response. The Cameron County LEPC views this post-exercise evaluation as essential for people to know what others are doing in case of an emergency, so the community can work as a team.

Practice Makes Perfect. The best way to realize the needs of an emergency plan is to stage exercises, as the Cameron County LEPC did with Operation Amigo. The LEPC found that problems, like international communication and notification of the local water treatment facility, became apparent only as they responded to a simulated emergency. These issues can be addressed now before a real accident happens.

Always Think Postively. Emergency planning and education should be conducted in a positive, non-threatening manner, and it should prove helpful to industry as well as the community in identifying hazards. Prior to Operation Amigo, the Cameron County LEPC realized that the county lacked fully encapsulated suits for use during the mitigation of a chemical accident. As of September 1989, the nearest such suit on the United States side of the border was in Corpus Christi, approximately 250 miles away. Local industry, exemplifying its positive working relationship with the LEPC, donated four fully-encapsulated suits to the Brownsville Fire Department and decontamination unit.

BUCKS COUNTY, PENNSYLVANIA

LEPC Profile

LEPC: 15 members, including representatives from law enforcement, fire service, emergency management, emergency medical service, civil defense, local and state government, industry, transportation, county health department, local community college, and the media

Population: 500,000

Facilities: 290 facilities have submitted Tier II reports and 99 facilities are subject to sections 302-303. Reporting facilities include chemical manufacturers, metal processors, federal facilities, coating manufacturers, water and sewer authorities, gas stations, specialty gas processors, distributors, swim clubs, and farms. 44 facilities reported under section 313.

Topics: LEPC Organization, Information Management, Funding, Planning, Compliance, Training

Bucks County is situated in southeastern Pennsylvania just over the Delaware River from New Jersey. Part of the five-county greater Philadelphia metropolitan area, Bucks County is located northwest of the New Jersey Turnpike between Philadelphia and Trenton, New Jersey. Industrial facilities and distributors are predominantly present both in the county's southern portion and in the lower half of its western edge. The central portion of the county is largely residential with scattered farmlands, while upper Bucks County is essentially a rolling rural area dotted with small municipalities.

LEPC ACTIVITIES

LEPC Organization. Prior to the enactment of the Emergency Planning and Community Right to Know Act of 1986 (EPCRA or commonly known as Title III), industry in the lower portion of the county had begun to address chemical emergency preparedness under the Chemical Manufacturers Association's Community Awareness and Emergency Response (CAER) program, in conjunction with Burlington County, located across the Delaware River in New Jersey. With the enactment of Title III, the CAER program essentially melded into the Bucks County Local Emergency Planning Committee (LEPC) program.

The assistance of a professional management consultant, provided to the Bucks County LEPC under a grant from Rohm and Haas, a large Philadelphia-based chemical company, proved to be critical in the LEPC's first four months. The consultant led the group in initial "team building" exercises to mold the committee into a cohesive group with a defined direction and objective. Team building highlighted the philosophies of each of the LEPC members through the use of group interaction, role-playing scenarios, addressing problems in small groups, and various other ways. As the members discussed their ideas about the purpose behind the Title III emergency preparedness message, the goals of the LEPC began to develop and take shape. As the members became more comfortable working with one another, they began to work more as a team than just a group of individuals.

The initial leadership provided by the management consultant helped the Bucks County LEPC members coalesce rapidly as a team. After the team concept was developed, the LEPC was able to organize themselves into appropriate subcommittees and to develop their own administrative procedures. The LEPC was divided into six subcommittees to direct the tasks of administrative duties, public information, training, emergency services liaison, data and information management, and emergency planning.

To ensure active participation in the LEPC, administrative rules require LEPC members to be on at least two subcommittees, and to review continued membership of anyone who misses two LEPC meetings in any year. The Bucks County LEPC credits its ongoing success as a well-organized and active LEPC to the indispensable aid of the management consultant during those first four months.

Information Management. The Bucks County LEPC data management subcommittee originally decided to load the Emergency Information System/Chemical (EIS-C) software package on available IBM-compatible computers at the county emergency management office. The EIS/C package records chemical, facility, transportation, and other planning and response information and graphically displays such information on color maps. After several months of use, however, members of the LEPC concluded that the EIS-C program did not fit the needs and budget of the LEPC, and that a substitute program would be more beneficial.

In place of the EIS-C program, the Bucks County LEPC established a simpler, dual system consisting of an IBM-compatible database using dBase IV software for hazardous materials data, and the Macintosh version of the CAMEO computer software system, developed by EPA and the National Oceanographic and Atmospheric Administration, for emergency response planning. The LEPC found the new dual system of dBase IV and CAMEO to be comprehensive and easy to use for the LEPC, while remaining within its limited budget constraints. The LEPC plans to implement the CAMEO-DOS version to consolidate their entire information network on the available IBM-compatible computers.

All personal computers in the offices of the Bucks County Emergency Management Agency have been linked together as a network. The dBase IV hazardous materials database was added to the network to provide ready access to information on facilities, budgeting, and other administrative functions. The Bucks County Communications Center, the central fire, rescue and police dispatch center for the county, can access this database for communicating hazardous materials information to emergency responders.

The Data Management subcommittee helped the Communications Center to develop a revised computer-aided dispatch system, which will have greater capabilities to handle information related to hazardous materials incidents. Before such a system was in place, dispatchers handled chemical emergency calls in the same manner as other emergency calls. During a chemical emergency call, however, the revised dispatch system prompts dispatchers with a series of questions to ask facilities about the nature of the accident to determine the most appropriate way to respond.

Funding. The Bucks County LEPC incorporated as a non-profit corporation and received tax-exempt status from the Internal Revenue Service in 1989. This step improved the LEPC's ability to solicit monies from facilities and from the county directly, avoiding the delay of applying for funding through county government channels.

In order to meet the budget requirements for 1988 and 1989, the LEPC proposed to the County Commissioners a dollar-matching concept between facilities and the county government. To provide an indication of what each facility's "fair share" of the industry contribution should be, the LEPC has analyzed data supplied on Tier I and Tier II reports and prepared a graduated scale of suggested contribution amounts. These voluntary contributions are solicited by a letter sent to each facility and municipality annually.

In each of the last three years, the Bucks County LEPC has received $27,500, $36,750, and $35,250 respectively from the volunteer contributions for a total to date of $99,500. This figure does not include a number of "inkind" donations of equipment and services given to the LEPC in the last several years. The LEPC credits much of its success in the past to its ability to financially undertake major endeavors, including establishment of a Hazardous Incident Response Team (HIRT), a data management system, and hazardous materials training and education programs.

A permanent revenue-raising program that will replace the voluntary contribution approach recently passed in ~e Pennsylvania state legislature. This program, outlined in Pennsylvania's Hazardous Material Emergency Planning and Response Act, allows the state and its numerous counties to levy chemical reporting fees on facilities which report under section 312 at or above the EPA-established threshold of 10,000 pounds for hazardous chemicals, and 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances (EHSs). The fees are intended to provide incentive for facilities to self-police Title III reporting, and thus to foster a safer business and community while reducing the chemical registration paperwork load for the LEPCs, local fire departments, and the Pennsylvania Emergency Response Commission (PERC).

Planning. The Bucks County LEPC succeeded in finding a number of creative ways in which to foster effective emergency planning within the county. The LEPC developed a county emergency plan that taps into existing emergency management resources, and helped in the development of compatible municipal and facility plans. The LEPC also identified areas of the county vulnerable to chemical incidents.

As required by Title III, the Bucks County LEPC created a chemical emergency response plan for the county. In order to ensure simplicity and compatibility with existing plans for other types of emergencies, the LEPC has developed the county plan within the framework of the Bucks County Disaster Operations Plan· mandated by the Pennsylvania Emergency Management Act. Because many of the mechanisms already in place to handle other types of public emergencies are also used to mitigate hazardous materials incidents, the LEPC felt that expanding on the existing emergency plan would be most efficient.

The county plan includes a general operation philosophy in addition to a standard operating procedure (SOP) for hazardous materials incidents, an SOP for an incident command system, and an SOP for the County Communications Center for use in hazardous materials emergencies. The LEPC reviews and updates the county emergency response plan annually during the first quarter of each year.

The county plan is supplemented both by municipal preparedness plans and by site-specific chemical emergency plans. Using the authority of Title III section 303(d)(3), the LEPC has asked facilities to submit such site-specific plans to the LEPC. In 1988, the Bucks County LEPC prepared both a Planning Guide for Site-Specific Plans and a sample site-specific plan to assist facilities in developing adequate response plans. Each facility is encouraged to work jointly with the municipality in which it is located and with the emergency responders who will be first on the scene in the event of an emergency. In order to ensure universal agreement on emergency response procedures, the LEPC emphasizes that each plan should contain a statement of joint development signed by both the facility's emergency coordinator and the municipal emergency management coordinator before the plan will be accepted for review by the LEPC.

The Bucks County LEPC also completed a county-wide vulnerability analysis, which is an estimation of the geographical area that may be affected as a result of a spill or release from a specific location. This analysis, based on information submitted to the LEPC in the site-specific plans, included identification of transportation routes and a review of emergency preparedness at the municipal level throughout the county. In the upcoming year, the LEPC plans to analyze the risk from facilities in the counties which adjoin Bucks County. The LEPC also plans to develop a "Field Manual" for incident commanders of hazardous materials emergencies. The manual will outline appropriate decision-making steps to mitigate chemical emergencies for a given on-scene situation.

As a cost-effective way to further assist local emergency responders in the mitigation of chemical emergencies anywhere within the county, the LEPC decided to develop a Hazardous Incident Response Team (HIRT). The HIRT, composed of fire and emergency medical service personnel, is a volunteer organization with no specific legal authority to respond to a chemical emergency; the HIRT responds at the request of the local first responders. Members of the HIRT elect a county coordinator, who is approved by the Bucks County LEPC, to head the team. Under the county coordinator, three regional coordinators supervise the activities of the HIRT in particular areas of the county.

Compliance. The Planning subcommittee of the Bucks County LEPC conducted an outreach program to identify and educate users of gaseous chlorine. By examining the records of the county health department, the LEPC determined that a large number of chlorine sources exist at sites throughout the county, including water wells and swimming pools.

An effort to contact these sources has resulted in both comprehensive planning for chlorine releases and, more significantly, a change from chlorine to less hazardous materials at numerous facilities. An effort has also been made by the LEPC to contact the many small farmsteads in the county's rural areas which may use and store hazardous chemicals during certain times of the year. Letters have been sent to the farms to introduce the LEPC and summarize the reporting requirements under Title III.

Training. About 7 5 people attended a one-day industrial workshop sponsored by the training subcommittee to train plant managers and facility emergency coordinators on developing site-specific plans. The subcommittee also sponsored a half-day workshop for municipal emergency coordinators and elected municipal officials; representatives of 27 of the county's 54 municipalities attended. The subject matter included an overview of the county Title III plans and the municipal requirements under the Pennsylvania Emergency Management Act. Information from the workshop was sent to those local officials that did not attend.

The Bucks County LEPC has put together a comprehensive training program for the county HIRT Team, as well as a program for groups of new recruits. Another major accomplishment of the Training subcommittee was the development of specialized training units for fire, police, and emergency personnel covering the Incident Command System and hazardous materials training. The LEPC expects that such specialized training of all emergency responders will require from two to three years to complete.

LESSONS LEARNED

The Spirit of Volunteerism is Alive and Well. An effective LEPC is one whose members give a lot of themselves. LEPC members should be willing to communicate their ideas and concerns to each other. They should strive to introduce the LEPC and the Title III message to facilities, communities, and emergency responders. Members need the conviction to participate in more than one committee, and must be able to attend meetings regularly. No one can be an LEPC member in name only; it takes a group of people who are willing to volunteer a lot of time and effort.

Be Resourceful with Resources. The ability to undertake major endeavors, from the establishment of a Hazardous Incident Response Team (HIRT) to the development of a data management system, requires a fund-raiser to be imaginative. An LEPC needs to use its resources, whether ample or scarce, to its best advantage through creative ideas that stretch each dollar. Development of a reliable source of funding such as a fund-matching system is but one example of a creative way of raising funds, incorporation as a non-profit corporation is another.

HARFORD COUNTY, MARYLAND

LEPC Profile

LEPC: 40 members, including representatives from police, fire, U.S. Senate Office, Maryland Emergency Management Agency, county departments of health and emergency operations, industry, media, Aberdeen Proving Grounds, public schools, and private citizens (chair: appointee of Harford County Executive).

Population: 185,000

Facilities: 31 facilities under section 302, primarily chemical manufacturers and water treatment plants; 96 facilities under sections 311-312.

Topics: Planning, Exercises, Outreach, Training, Funding

Harford County is located in northeastern Maryland at the north end of the Chesapeake Bay. The Susquehanna River forms the eastern border of the county and flows into the Bay. The major transportation routes include Interstate Highway 95, US Route 1, and US Route 40; railroads include Amtrak, the B&O, and US government tracks. The coastal shoreline of Harford County is primarily wetlands, and has been designated as the Susquehanna National Wildlife Refuge. The county also contains the Aberdeen Proving Grounds - Edgewood Facility, a Department of Defense chemical weapons stockpile installation.

The Harford County Council passed Bill No. 90-83, which became effective on October 16, 1990, revising existing county legislation on hazardous wastes. The bill allows for the recovery of all costs (i.e., operational, administrative, personnel, payroll, and legal) incurred during a response action from the individual or organization responsible, immediate reporting of all fixed facility and transportation incidents involving hazardous substances and submission of a written follow-up report within two weeks, right of entry for monitoring and inspection by a representative of the Harford County Department of Emergency Operations (DEO), and civil action authorized in the event of any violation. The LEPC recently received the Chemical Manufacturers Association's Community Awareness and Emergency Response (CAER) achievement award for its coordination of emergency planning between government and industry in Harford County.

LEPC ACTIVITIES

Planning. In order to prepare the comprehensive local response plan, the LEPC in 1988 sent a letter to all facilities which had reported under section 302. The letter requested that a facility response plan, including a map of the site and the surrounding area, be developed, and provided guidelines for the completion of the plan. In 1989, DEO began to conduct facility visits to review facility response plans; prior to the visit, each facility was issued the inspection checklist that would be used to evaluate the facility's plan.

At the present time, facility site visits by a member of the sheriff’s office are being conducted to serve as the basis for a hazards analysis to be developed in conjunction with the facility and the local fire department.

As part of its Title III plan, the LEPC developed Annex N: Commander's Guide and Check List for Hazmat Incidents, a 24-panel wall chart that summarizes the responsibilities of the lead officials involved in a hazardous materials response. Annex N indicates the individual mission and key activities for each phase (before arrival, on arrival, operational, and close out) of the response for the Incident Commander; Hot, Warm, and Cold Zone Commanders; Police Commander; and Public Information Officer.

The two key chemical emergency planning concerns currently facing the Harford LEPC are the Aberdeen Proving Grounds (APG) and local schools. APG is participating in the Army's Chemical Stockpile Disposal Program (CSDP), under which the Army has been tasked with destroying its unitary chemical weapons, all of which contain extremely hazardous substances.

If an incident were to occur at the facility, it could pose a serious threat to the public health and the environment. Although APG is a federal facility and thus is not obligated to comply with Title III, it is closely involved with LEPC activities. Personnel from the installation serve on many of the LEPC's subcommittees, and APG notifies the community in the event of any incidents at the facility. In coordination with the LEPC, APG has developed a chemical emergency contingency plan. The LEPC and APG also conduct joint response exercises and training in the treatment of persons exposed to chemical agents.

Site-specific planning for hazardous materials incidents involving schools, either for releases originating from schools or from nearby facilities potentially affecting schools, became an important issue in 1990. An incident at a local school in which improper storage procedures resulted in the mixing of muriatic acid and chlorine stored for the swimming pool served as an impetus for this program. A cloud of chlorine was produced, and school officials simply ventilated the area without an evacuation or notification of authorities. A debriefing at the LEPC meeting led to procedural changes and served as a spur to the school planning initiative.

The LEPC developed a sample plan outline and provided this guidance as part of a briefing delivered to all public and private elementary and high school principals to assist in the preparation of school contingency plans. The guidance addresses emergency notification of schools and the public and describes the overall communication policy. A school newsletter bulletin for parents, a school notification memo, a sample announcement for the radio Emergency Broadcast System, and a straightforward plan assessment checklist were included. Individual schools develop plans to address their particular situation; some schools are just yards away from chemical facilities or railroad yards, while others are quite distant from any outside risk. These plans will be reviewed by local response officials, and comments and suggestions will be provided to the schools.

Exercises. Harford County participates in regular exercises in conjunction with the Aberdeen Proving Grounds facility. In the summer of 1990, APG and Harford County conducted a hazardous materials field exercise. The 1988 Combined Response Force Exercise (CRFX 88) was a field exercise simulating a release of mustard agent from unearthed munitions at APG. The 1988 Command Post Exercise (CPX 88) was a tabletop exercise simulating a release of phosgene from a derailed railroad tank car.

Both of these exercises used hypothetical toxic plumes modelled using the Computer-Aided Management of Emergency Operations (CAMEO) system developed by the National Oceanic and Atmospheric Administration and EPA. CAMEO also provided Response Information Data Sheets (RIDS), chemical-specific guidance similar to MSDSs oriented for response purposes.

Outreach. The LEPC, in conjunction with a local cable TV company, has developed a video, "Hazardous Materials in Harford County," which discusses public safety issues. The video was advertised in the local media and in bulletins which were mailed to community associations. It has been shown on the local cable television station, presented to community groups with a speech by an LEPC member, and is available at all public libraries. The video is designed to familiarize people with the hazards around them, and suggests that families conduct "chemical" drills in their homes in similar fashion to fire drills.

The LEPC has also developed a brochure "Stay Cool, Stay Alive," which explains what people should do in the event of a possible hazardous chemical incident if they are at home or on the road. The brochure has been distributed through the school system and to community groups. "Play It Safe: Handle Hazardous Materials with Care," a 20-page hazardous materials safety manual, has also been distributed to community groups at LEPC presentations. The LEPC has also distributed copies of the Department of Transportation's Emergency Response Guidebook to all fire, police, and public works department employees to improve response time and provide initial safety assistance to residents.

Training. The Department of Emergency Operations maintains a 14-member hazmat team composed of regular DEO employees and employees of local industry. The team has converted two school buses into response vehicles; one serves as a spill unit and the other as a command post and storage for Level A and B response equipment. The team conducts weekly training in Level A response operations and all members have been trained to Hazmat Technician level per Occupational Safety and Health Administration standards under 29 CFR 1910.120. DEO is now providing training and equipment to all twelve local fire departments, including training on spill containment and decontamination procedures.

The hazmat team conducts an annual emergency exercise of either table-top or field varieties. DEO also invites outside organizations to conduct seminars in specific areas of expertise; the Centers for Disease Control has provided training on the chemical agents present at APG.

Funding. Harford County provides funding for a hazardous materials team and staff for the LEPC operations. FEMA, through the Army's Chemical Stockpile Emergency Preparedness Program (CSEPP) designed to support chemical emergency preparedness activities at the eight CSDP sites, also provides one emergency planner who participates in LEPC meetings and activities. In August of 1988, the LEPC organized a presentation to the Maryland Association of Counties' Annual Convention, aimed at building support for legislation that would help local jurisdictions recoup the cost of implementing Title III. This caucus formally resolved that the Governor and General Assembly establish a fee system or redirect general revenues to support the costs of data management and training at the local level.

LESSONS LEARNED

Hazardous Materials Transportation Issues Cannot be Ignored. Initially, the Harford County hazardous materials preparedness activities had focused on incidents occurring at fixed facilities, such as chemical companies and water treatment facilities. The experience of the last several years, however, has shown that the 1-95 corridor presents a much more significant risk in terms of hazardous materials events. Transportation incidents introduce a greater amount of uncertainty into a response operation; there is no facility representative or site plan, or even a file of MSDSs to identify the problem immediately. As a result, the hazmat team has had to focus on developing a library of research materials to identify the substances involved and proper response techniques for transportation incidents.

LEPC Meetings Can Serve an Expanded Role. The Harford County LEPC holds a debriefing session at the monthly LEPC meeting in which recent hazardous materials incidents in the county are discussed. Representatives from involved facilities are invited to attend and meet with members of the response community to discuss potential problems, as well as how the facility and community conducted the response and suggestions for improvements are considered. The recommendations are primarily incident-specific; for example, one facility has since paved its grounds and installed a berm and holding pond. These sessions have also helped to increase awareness of hazardous materials issues at facilities and provide chemical-specific information to local responders. Experience with handling less common chemicals such as methyl ethyl ketone and toluene diisocyanate has been provided to local responders by facility representatives at these sessions.

DALLAS COUNTY, TEXAS

LEPC Profile

LEPC: 33 members, including facility representatives, a state representative, city councilman, hazmat team director, and representatives from the Sierra Club; League of Women Voters; local police, emergency management, transportation, environmental, and fire agencies; Dallas-Fort Worth Hospital Council; local television and radio news stations; Chamber of Commerce; and the North Central Texas Council of Governments.

Population: 1,800,000

Facilities: 150 facilities reported under section 302, including chemical distributors and users, such as computer chip manufacturers, food processors, water treatment facilities, and engraving and plating operations; 1,500 facilities have reported under sections 311-312.

Topics: Use of Section 313 Data, Planning, Hazards Analysis, Exercises, Outreach, Funding

Dallas County is a primarily urban county located in north central Texas and encompasses 27 jurisdictions, including the city of Dallas and the Dallas/Fort Worth airport. The county includes five ·major railroads, numerous interstate highways, and major pipeline systems which carry a variety of hazardous materials.

The Fire Marshall's Office serves as the information coordinator for the LEPC. The Dallas County LEPC has formed five subcommittees to address the requirements of Title III: the Hazardous Material Facility Liaison Committee, the Emergency Response and Resources Committee, the Public Education and Information Committee, the Transportation Committee, and the Right-to-Know Committee. Each LEPC member serves on the subcommittee of their choice, many choosing the committee that best utilizes their expertise; for example, a media representative serves on the Public Education and Information Committee. The LEPC meets monthly and the Chair, Vice-Chair, and Secretary each serve a two-year term.

LEPC ACTIVITIES

Use of Section 313 Data. The Dallas County LEPC was the recipient of a fee waiver for the use of the Toxic Release Inventory (TRI) database. The TRI database contains the data submitted under Title III section 313 on chemical releases from manufacturing facilities. The fee waiver program, implemented through EPA's Office of Toxic Substances, provides LEPCs a waiver from the costs associated with accessing the TRI database for conducting research and data searches.

The LEPC used the TRI data to examine the chemicals being emitted in their county and to compare those emissions to emissions in other counties in Texas. The LEPC has also used the TRI database to answer questions from the community regarding facilities in their areas. To alert the public that the LEPC has access to the TRI data, the LEPC broadcast radio announcements.

The Dallas County LEPC hopes to participate in any future fee waiver programs, and is already planning projects for using the data. With the LEPC's increased efforts in public education, interest in the TRI data has already increased. The LEPC is developing presentations about the TRI data to supplement the notices and radio announcements to guarantee increased community participation. In addition, the LEPC is looking forward to using the new TRI data to continue their study of the chemicals and emissions in their district as they compare to other districts.

Planning. There are three emergency planning programs in effect in Texas: the Federal Emergency Management Agency (FEMA) requirements for an all-hazards plan, the state's Texas Disaster Act of 1975 requirements, and the Title III emergency planning requirements. The FEMA planning requirements include planning elements for events such as tornadoes, floods, earthquakes, and other natural and man-made hazards. The Texas Disaster Act of 1975 places the responsibility for emergency planning on the mayor of the city or the county judge, in an unincorporated area. Title III places the responsibility for emergency planning on the LEPC and sets forth required elements for these plans.

The Texas SERC designated local emergency planning districts along county lines. The Dallas County LEPC has conducted its emergency planning efforts under Title III within the existing planning structure established under the Texas Disaster Act to prevent the development of duplicative planning bodies and plans. As a result, much of the city and area plans that were previously developed were incorporated into the Dallas County LEPC emergency plan.

The Dallas County LEPC encourages facilities that have reported under section 302 to develop and submit emergency plans to the LEPC on a voluntary basis, and to use the LEPC as a source of guidance and assistance for emergency planning. These facility plans, once developed, are kept by the LEPC and a copy is given to the fire department with jurisdiction over the facility.

The LEPC is coordinating its emergency response plan with neighboring LEPCs to insure that inter-jurisdictional issues are addressed. Each city is asked to coordinate their emergency response plan with neighboring cities to ensure that conflicts and duplication of efforts in multijurisdictional emergencies can be minimized. In order to test and coordinate their emergency plan with neighboring counties and to assist cities in testing and coordinating their plans with other cities, the LEPC is developing a table-top exercise, which is discussed in the exercises section of this profile.

The "Dallas County Hazardous Substance Emergency Response Plan" was completed and submitted to the SERC prior to the October 17, 1988, deadline. The plan is reviewed and revised annually. Dallas County encompasses 27 different jurisdictions. Prior to the enactment of Title III, only three jurisdictions had state-approved FEMA plans, five had no plans for chemical incidents, and the remainder had only outdated standard operating procedures. The LEPC estimates that most, if not all, cities will have emergency response plans that meet the Title III planning requirements by early 1991. The efforts of the Dallas County LEPC, in combination with the increased awareness of chemical hazards, has resulted in the steady and significant improvement of chemical emergency preparedness within the county.

Hazards Analysis. U.S. EPA Region 6 and a consultant with Southern Methodist University assisted the Dallas County LEPC in developing fixed facility risk assessments. As part of this project, they developed a computer program to calculate simultaneously the vulnerability zones for a single chemical under varying atmospheric conditions. In order to collect the facility-specific data necessary to conduct the risk assessment, the Dallas County LEPC developed a questionnaire which was sent to each facility that initially reported under section 302 as having extremely hazardous substances (EHSs) present on-site.

The questionnaire requested more detailed chemical information than could be provided on a Tier I or Tier II report. The information requested included product name, EHS name, the chemical abstract service (CAS) registry number, molecular weight, density, melting point, boiling point, flash point, specific gravity, vapor pressure, type of storage container, maximum amount on hand and average daily amount (as an amount rather than a range), temperature of the stored chemical, form of the stored chemical, and the location of any diked storage.

Of the 250 facilities sent questionnaires, 80 percent responded. Of the 80 percent, 150 facilities had EHSs present above the threshold planning quantity (TPQ) amount, and the remainder did not but had notified anyway. The LEPC is developing the vulnerability zones for these facilities and each facility will receive a copy of the analysis for data verification. Once reviewed, the LEPC will both incorporate the analysis into their county-wide emergency plan and work with the North Central Texas Council of Governments to use the Geographic Information System, a computerized mapping system, to plot the vulnerability zones to identify vulnerability zone overlap and corridors of concern for future planning efforts.

Exercises. Members of the LEPC have served as responders and response officials in the capacity of their professions (e.g., fire fighters), however, not in their capacity as LEPC members. In order to create a more active role for the LEPC in incident response, the Dallas County LEPC is developing a generic table-top exercise. The purpose of this exercise is to test and evaluate multi-jurisdictional response and resource coordination. As a result, the generic exercise can be customized to involve any two cities or municipalities, any facility within the area, and any type of incident.

The first use of this exercise is scheduled for March 1991. The exercise will involve the cities of Dallas and neighboring Mesquite. The release will be a chlorine release from a truck accident on a major interstate, which borders both cities. Dallas County LEPC is working to develop the next table-top exercise, which will involve a release from a facility and require coordination between two counties and the facility response personnel.

Outreach. The Dallas County LEPC began their outreach efforts by targeting industry likely to be subject to Title III reporting to inform them of the requirements. Initially, the LEPC conducted two seminars with the Chamber of Commerce. As awareness of Title III grew, the LEPC was increasingly requested to make presentations and conduct training seminars.

The requests came mostly from industry and trade associations; however, environmental and community groups also expressed interest. These presentations and seminars have been held twice a month, every month, over the last three years.

For the upcoming year, one of the major goals of the Dallas County LEPC is to shift outreach away from industry to public education. The LEPC is working on the development of a speaker's roster to be distributed with a one-page fact sheet describing the LEPC, its purpose, and its activities to various community groups, such as the Rotary and Lions Clubs. Presentation materials, including a general video and slide presentation, are being developed. The LEPC is using its media representatives and other members of the Public Education and Information Committee to develop both a thirty second public service announcement to be broadcast on the local news radio station and a video to be shown on cable television.

Funding. Dallas County government allocates approximately $6,000 per year to the LEPC. This money is primarily used for printing and postage and public outreach. No fee structure exists in Dallas County because the county does not have the authority to establish and collect reporting fees. In addition, the Texas Department of Health has announced plans to make small grants available to LEPCs for specific projects. The Dallas County LEPC hopes to utilize this avenue of funding to support a transportation risk assessment.

The majority of the administrative support for the LEPC is provided by the Fire Marshall's Office. Two county employees are on the staff of the LEPC-one from the Fire Marshall's Office and one from the Dallas County Institute of Forensic Sciences. These two county employees greatly assist the LEPC by developing materials such as fliers and presentation materials.

LESSON LEARNED

Improved Cooperation, Improved Emergency Plans. Many city and county planners became aware of the Title III planning requirements through seminars, publications, and word-of-mouth. As a result, many city and county planners voluntarily upgraded their existing city plans or county plans developed under either their own standards or those of the Texas Disaster Act to conform to the Title III standards. In addition, jurisdictions are more aware of the importance of multi-jurisdictional planning, particularly for chemical releases. Title III, through the establishment of the LEPC, has formed a nucleus for communication and planning among jurisdictions within Dallas County.

Improved Outreach, Improved Awareness, Improved Information. The Dallas County LEPC's extensive outreach efforts to facilities in the county regarding Title III has greatly improved the quality and quantity of specific facility chemical information. Subsequently, this improved and enlarged amount of information is now more readily available to emergency responders and to the general public. The 500 pound threshold, established by the State of Texas for all OSHA hazardous substances reinforces the growing awareness that even small amounts of chemicals can be hazardous when handled improperly. Title III has improved the chemical awareness among not only facilities, but also emergency planners, emergency responders, and the general public.

EPA OSWER 91-006.2, October, 1991, Series 6, No. 8

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Cherry Hill, New Jersey; Manitowoc County, Wisconsin; Greene County, Missouri; State of Hawaii; Arapahoe County, Colorado

ABOUT THIS BULLETIN

This is another in a series of bulletins that EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices -- for example, planning, compliance, information management, hazard analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed in the box at the bottom of the first page of the profile for easy reference, along with descriptions of the planning district or state and LEPC or SERC membership. The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information. For your convenience, a subject index covering the contents of the eight Successful Practices bulletins has been included in this bulletin. The index is designed to allow the reader to identify successful Title III implementation practices by topic area, and then locate the Successful Practices bulletin in which the practice was profiled. Details on all eight bulletins, and how to order them, are provided on the page preceding the index.

CHERRY HILL, NEW JERSEY

LEPC Profile

Membership: 15 members, including elected officials and representatives of the Office of Emergency Management, police and fire departments, public works, the American Red Cross, New Jersey Department of Environmental Protection, emergency medical services, the general public, and industry.

Population: 79,000

Facilities: 21, including a major pharmaceutical manufacturer

Topics: LEPC Organization Planning Information Management Training Outreach

The Township of Cherry Hill is located in Camden County, four miles east of Philadelphia. While there are several major industries and industrial parks within the township, the Cherry Hill LEPC is also concerned with hazardous materials transportation throughout the township. Two major interstate highways, the New Jersey Turnpike and I-295, run through the heart of the township and several trucking terminals are located within Cherry Hill.

LEPC Organization. Prior to the passage of the Emergency Planning and Community Right-to-Know Act of 1986 (commonly known as Title III), Cherry Hill already had an emergency planning group composed of representatives of different public- and private-sector organizations Cherry Hill, New Jersey within the township. This group, the Cherry Hill Emergency Management Council, was created by the mandate of the New Jersey Civil Defense Act of 1942 (Title 58, App. A:9 et al). The Act required New Jersey municipalities to develop emergency operations plans for natural and manmade disasters. Following the passage of Title III, Cherry Hill and many other municipalities in New Jersey incorporated the roles and responsibilities of the LEPC into the structure of these established councils.

Planning. Using the existing emergency operations plan developed under the direction of the council, the LEPC updated the hazardous materials annex as well as the overall plan to conform with the comprehensive planning process encouraged by the Hazardous Materials Page2 Cherry Hill, New Jersey Successful Practices Emergency Planning Guide developed by the National Response Team, as required under Title III. This document provides guidance on identifying and assessing chemical hazards throughout the community and developing an emergency plan that is coordinated and integrated with all organizations, from fire departments to the American Red Cross, that have a role in emergency situations. To identify chemical hazards within the township, the Cherry Hill LEPC reviewed follow-up notification reports on hazardous material accidents that have occurred within the township, as well as the right-to-know inventory forms

(New Jersey's version of the Tier II form required under section 312 of Title III) submitted by reporting facilities. This information highlighted the need to address transportation corridors in the planning process. Because of the size and complexity of the hazardous materials transportation hazards, the Cherry Hill LEPC recognized the need for immediate access to chemical hazard information in a reliable and integrated format.

Information Management. Initially, the information collected by the Cherry Hill LEPC under Title Ill, which included the right-to-know inventory forms, MSDSs, and facility emergency plans, were alphabetized. by facility name and placed in a file cabinet in the Police Communications Center. A copy of the facility's emergency plan and right-to-know inventory form was also provided to the appropriate fire district (there are seven fire districts in Cherry Hill) by each facility. These materials were stored in a file drawer on the fire chief's response vehicle. While the information is available for planning activities, access to hazard and inventory information critical to response operations was limited at best. The Cherry Hill LEPC decided that a computerized information management system was needed to support their emergency operations. The system would link all response entities (e.g., fire department, the hazardous materials response unit, and emergency management) to an integrated, centralized database. However, the response community lacked sufficient computer hardware or software for such a system, the LEPC had no funds available, and the township had a cap on expenditures that limited their ability to fund such a major endeavor.

Because of the commitment of its members, the LEPC did not give up in the face of such significant obstacles. Instead, they identified a way to access funds necessary to develop their system. While each municipality in New Jersey operates with a cap on expenditures, the state provides a reserve of funds for major capital improvements such as resurfacing roads or upgrading the computer system for the police department. Recognizing this as an avenue for obtaining the necessary funding, the LEPC made a presentation to a committee of the Township Capital Improvement Committee that manages the reserve for Cherry Hill. Following the presentation, which stressed the need for immediate access to emergency information, the committee, composed of the township's business manager, and the directors of several of the township's departments, approved a capital improvement grant of $11,000 in May 1991.

The Cherry Hill LEPC has decided to use the CAMEO-DOS software to help them manage their Title Ill information. CAMEO (Computer-Aided Management of Emergency Operations) is designed to manage chemical- and facility-specific information about hazards in or near a community and to help emergency response personnel plan for the safe handling of chemical accidents. Developed by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA), CAMEO is available at cost to state and local governments through the National Safety Council. Because of its low cost, the LEPC was able to purchase the software prior to obtaining the grant money. Currently, CAMEO is run on the personal IBM-compatible computer of the deputy coordinator for the LEPC. However, the LEPC is reviewing bids for purchasing computers for the Office of Emergency Management and the mobile command response unit.

Training. The Cherry Hill LEPC is currently developing a training program for all potential CAMEO users in the township. The training program will explain how to use CAMEO to develop emergency plans; retrieve facility Title III reports, emergency plans, and information on response resources; and use CAMEO's mapping capabilities to search and display transportation routes, facilities, and sensitive populations and create overlays specific to their planning or response needs. A full-time firefighter with extensive computer experience has been tapped to provide CAMEO training to all personnel in the fire districts as well as other response personnel in the township. The training course is being developed using materials the LEPC's deputy coordinator obtained at the national CAMEO conference held in Washington, DC, in January 1991.

The Cherry Hill fire and police departments have also sponsored several Title III-related training programs, including hazard awareness training for all first responders and incident command courses for all police and fire supervisors. These training courses have helped to develop closer relationships among all emergency services within the community. In addition, the Emergency Management Office recommended that municipal department directors select certain employees to attend a series of train-the-trainer courses on hazardous materials awareness and employee right-to-know; this training was completed in the first half of 1991. These new trainers, in turn, will ensure that all municipal employees receive hazardous materials awareness and employee right-to-know training on a regular basis.

Outreach. Working to increase awareness of chemical hazards and the Title III requirements is an ongoing process for the Cherry Hill LEPC. A video, Hazardous Materials: An Introduction for Public Officials, was provided to all municipal department directors. The video, which describes the requirements and responsibilities of local government in implementing Title III, was also shown to the LEPC and to facility representatives. The Office of Emergency Management also makes available the Federal Emergency Management Agency's (FEMA) home study course, Hazardous Materials: A Citizen's Orientation. The LEPC has found that such presentations and courses provide a good catalyst to get more people aware of chemical hazards in the community and, hopefully, more involved in reducing those hazards.

One result of the LEPC's drive to increase public awareness of chemical hazards has been with the township's seven nursing homes. The LEPC has been helping the nursing homes develop emergency plans required under state law. As a result of the LEPC's cooperation, the nursing homes became more aware of chemical hazards Page4 Cherry Hill, New Jersey Successful Practices in their immediate vicinity and the potential impact to their establishments. One outcome of this cooperation with the nursing homes is that the nursing homes are working on developing mutual aid agreements. The agreements will established emergency procedures so that if one nursing home has to be evacuated, procedures will be available to distribute the evacuees among the other homes in a timely and safe manner.

Faster Communication -- Packet Radio

The LEPC also has used some funds to purchase radio modems needed to establish a ''packet" radio system. Packetradio allows a computer to be connected to a high frequency radio (e.g., police radio) via a radio modem that relays data to a receiving computer that also has a radio modem. The information is transmitted in small "packets" of data (250 characters per packet) to a receiving computer, which must return a message that the information was received correctly before the next packet is sent.

Because there is down-time between each packet, one frequency can be used by five or six computer stations at one time. This is important in emergency situations when there is a high demand on communication systems and limited frequencies are available.

The LEPC believes this communications system is an invaluable tool in response actions, especially at remote sites (e.g., transportation-related incidents). Packetradio allows the emergency operations center to transmit Title III information or other emergency information contained in the CAMEO system to response sites where conventional communication systems are nonexistent, malfunctioning, or destroyed.

In addition, the costs of establishing such a system are very small when compared with other, more elaborate communication systems. Packetradio relies mostly on existing hardware - police and fire radios, cellular telephone, personal computers, and existing short wave radios, run by a network of 29 HAM radio operators in the township more than willing to volunteer in any emergency situation.

LESSONS LEARNED

"It's All in the Presentation," says Craig Martin, deputy coordinator for the Cherry Hill LEPC, referring to the presentation that got the LEPC a $11,000 capital improvement grant to purchase a computerized planning and information management system. With the LEPC stressing the usefulness of the Title III information for responding to hazardous materials accidents and the cost effectiveness of the EPA and NOAA-developed CAMEO software, the committee could not say no to the LEPC.

"The pitch was easy," Craig Martin emphasizes, "community right-to-know identifies the potential dangers and, through the software, we can find out how close these dangers are to sensitive populations, like nursing homes or daycare centers."

The Commitment Is There, It's the Time That's Needed. The Cherry Hill LEPC has no full-time staff. While the LEPC is composed of people dedicated to fulfilling the Title III mission, they do have full-time jobs and families, and finding the time to accomplish the goals they have set for themselves is difficult. Many training courses have to be offered on weekends, and meetings are held at night. To help lighten the load of the volunteers, the LEPC is working on having the full-time personnel from the fire department take on the role of managing the CAMEO system. In addition, the LEPC is also considering accessing persons who have been ordered to perform community services as the result of driving while intoxicated or other such violations. These persons, depending on their skills or expertise, can help enter data into the CAMEO system or help write or review emergency plans. LEPCs also should look anywhere or anyway to find help. Craig Martin is a good example - he is a police officer and an adjunct instructor for FEMA's Emergency Management Institute. His "part-time" role as deputy coordinator for the LEPC and the Emergency Management Office is funded by FEMA's emergency management assistance grant program.

MANITOWOC COUNTY, WISCONSIN

LEPC Profile

Membership: 25 members and 12 alternates, including representatives from county emergency government, hazmat response team, county board of supervisors, fire service, law enforcement, hospitals, the American Red Cross, industry, transportation, citizens, news media, the Towns Association, and local health and public works departments.

Population: 82,477

Facilities: 216, including several food processing and storage companies

Topics: Outreach, Exercises, Training

Manitowoc County, Wisconsin, located near Lake Michigan approximately 90 miles north of Milwaukee and 45 miles south of Green Bay, includes the cities of Manitowoc and Two Rivers. Several railroads and Interstate 43 (I-43) pass through Manitowoc County.

Most industry and population in the county are concentrated in the cities of Manitowoc and Two Rivers. The Manitowoc County Local Emergency Planning Committee (LEPC) has established five separate subcommittees to address the following issues: education, funding, planning, exercises, and LEPC membership.

Outreach. Upon establishing the education subcommittee, the LEPC recognized that facilities throughout Manitowoc County must understand the Title III requirements and Manitowoc County, Wisconsin their reporting responsibilities. Members of the education subcommittee invited local industry representatives, the county Tavern League, agricultural cooperative (co-op) representatives, and a representative from a local advertising agency to attend their meetings.

At an initial, priority-setting meeting in October 1989, the subcommittee decided that the agricultural community should be the first audience for focused outreach activities, as most local farmers were unfamiliar with Title III reporting requirements. The Manitowoc County LEPC sent a letter to all area farmers introducing Title III and providing contacts and telephone numbers for more information. A list of commonly-used agricultural chemicals covered under Title III was included with the letter.

The LEPC also worked with the local Agricultural Stabilization and Conservation Service (ASCS) office to send this same letter in conjunction with ASCS's mailing to area farmers in January 1990. The ASCS is an agency within the Department of Agriculture with approximately 2,800 county offices nationwide that administers federal agricultural programs to local farmers. Coordinating with the ASCS allowed the Manitowoc County LEPC to reach a large audience at little expense. The letter designated area co-op agents as contact persons because local farmers are familiar with these agents.

About 1,450 farmers from the total mailing of 1,500 called for more information. As a result of the agricultural outreach campaign, the number of farmers that submitted Tier II forms under section 312 of Title III increased from one to twenty-seven. Subsequently, the education subcommittee has aimed its outreach campaign at both local industry and the general public. As part of the industry outreach campaign, the subcommittee consulted with representatives from the local industrial council, various members of the press and radio, and a local advertising agency. All parties agreed that the campaign should be short, simple, and to the point and that the goal of the industry outreach campaign was to make businesses aware of Title III in a visual and compelling way.

The LEPC asked representatives from local newspapers and radio stations to attend an education subcommittee meeting to plan the outreach campaign. Pictures with brief Title III-related articles appeared in various local newspapers. An advertising agency donated a billboard as a public service, providing a highly visible Title III message on the well-traveled highway between Manitowoc and Two Rivers. The billboard warned of steep fines for industries that fail to report the presence of hazardous materials on their premises using the message, "By playing this lottery, you could lose $25,000!" The board depicts a dollar bill in the left hand comer with tiny pieces of it breaking apart, and a phone number for more information.

The total cost to the county for the billboard was about $70 for production and posting fees. Ads echoing the billboard's warning appeared in various local newspapers throughout Manitowoc County during the first two weeks in October 1990. The costs for printing the ads varied - the Manitowoc County LEPC secured free space in some papers, and received public service- or small business-reduced rates in others.

The ads ran in at least one area paper on each day of the two-week period. Since the industry outreach campaign started, the number of facilities that submitted Tier Il forms under section 312 of Title III increased from 113 to 216. The goal of the public outreach campaign, which was developed concurrently with the industry campaign, was to introduce Title III and its community right-to-know message to a largely unaware public. A separate advertisement was developed and appeared every day for the last two weeks in October 1990, in one of the area papers and at least one day per week in all the others. The theme of the advertisement was "It's Your Right to Know," emphasizing the role of the LEPC in planning and preparedness, and providing a phone number for more information. The Emergency Government Director, the LEPC chair, and the chair of the education subcommittee followed the press ads with appearances on local radio talk shows. The education subcommittee also has formed an LEPC Speakers Bureau whose members are available to speak before area groups on Title III-related topics. A list of speakers is posted at the public library, area colleges, the county clerk's office, and other strategic Manitowoc County locations. Speakers do not charge fees, but groups may make a donation to support LEPC activities.

As a result of its outreach efforts, the LEPC received a "Certificate for Excellence in Hazardous Materials Outreach Programs" from the Region 5 Regional Response Team, a group consisting of regional representatives from the fourteen federal agencies with hazardous materials response and planning expertise, as well as the a representative from each state in the Region. These certificates award LEPCs within the Region that have exceptional outreach, planning, exercise, training, or hazards analysis programs.

Exercises. The LEPC's public awareness campaign was also supported by two field exercises Manitowoc County has held in cooperation with the local hazmat team. These exercises (held on June 13, 1989, and October 6, 1990) helped to increase awareness of Title III preparedness and response issues. Manitowoc County officials have held various full-scale exercises in the past with two nearby nuclear plants, but only recently have city officials been involved in an exercise in which they have to interact with their county counterparts.

Training. Because the Manitowoc County LEPC is made up of people with diverse backgrounds, the LEPC decided to first understand the emergency preparedness and response duties or interests of each LEPC member. As of May 1991, representatives from the local hazmat team, the Red Cross, local law enforcement, emergency management, and the County Public Works Department, as well as an emergency planner from the Kewaunee nuclear power plant all have made presentations to the Manitowoc County LEPC. These presentations have included a demonstration of hazmat emergency response equipment and tours of the police department and its dispatch center, as well as overviews of Red Cross emergency services, the mobile command center and emergency operations center, progress on a household chemicals outreach campaign, and emergency planning techniques at the local nuclear power plants.

Accident Tests LEPC Plan

The emergency response plans of the Manitowoc County LEPC were tested recently when a tanker truck leaked ferric chloride solution along a stretch of roadway in May 1991. The tanker truck had gotten lost because the driver had no maps and the truck routes may not have been clearly identified. To make matters worse, the truck was not inspected after the initial clean-up, creating new leaks to be addressed by responders. High temperatures and extreme humidity hampered the responding hazmat team, forcing team members to work in short, 15-minute shifts.

The coordinated efforts of a range of organizations, including fire, police, public works, Red Cross, emergency government, news media, and the LEPC, helped to alleviate a potentially dangerous situation. Direct radio links with local radio stations allowed emergency government personnel to make protective action announcements to the public. Mobile phones and fax machines, as well as other communications equipment, were made available to response personnel. With the completion of the responders' work some eight hours after the release began, the efforts to coordinate Manitowoc County emergency planning process had proven extremely effective.

LESSONS LEARNED

Title III Outreach Is a Continuous Process. The Manitowoc County LEPC believes that outreach is an ongoing process even though they have conducted several effective outreach campaigns. The LEPC recognizes that there may be many other facilities which are unaware or uninterested in the requirements of Title III. In fact, the LEPC still receives a large number of calls each month about reporting requirements, fee payments, and other regulations under Title III. Because turnover at facilities and, more important, within the LEPC and emergency response community is continuous, the LEPC believes providing these groups with continuous information on Title III and the LEPC's role in planning for potential chemical emergencies is essential.

An Emergency Response Plan Is a Living Document. In responding to the recent ferric chloride leak from a tanker truck in May 1991, the Manitowoc County LEPC realized that emergency planning is a dynamic, ongoing process. As a result of that accident, the LEPC recognized that hazardous materials transportation routes should be clearly identified throughout the county and that highway patrolmen should be called earlier to carefully inspect any vehicle involved in a hazardous materials incident before letting the vehicle leave the scene. These issues are to be addressed in future LEPC meetings. Climate can also be a significant factor in response actions; to avoid exhaustion, hazmat personnel had to receive tremendous amounts of fluids while working in high temperatures. Fatigue on the part of responders can contribute to loss of concentration, especially during a long response incident such as this recent one. To resolve these issues in their emergency plan, the Manitowoc County LEPC plans to establish mutual aid agreements with hazmat teams from neighboring communities to provide back-up support in future incidents of long duration.

GREENE COUNTY, MISSOURI

LEPC Profile

Membership: 111 members, including representatives from the local health, public works, and highway departments, fire services, Greene County Commission, local and state police, hospitals, American Red Cross, utilities, emergency services, the Burlington Northern Railroad, news media, University of Missouri, industry, Watershed Committee, Household Hazardous Waste project, individual citizens, and citizen groups. The chair is the director of the Springfield-Greene County Emergency Management Office.

Population: 200,000

Facilities: 245

Topics: LEPC Organization, Information Management, Hazards Analysis, Exercises

Greene County is located in southwestern. Missouri; the county seat, Springfield, has a population of over 140,000. Primary transportation routes in the county include the Burlington Northern and Missouri Pacific Railroads, Interstate 44, and U.S. Highways 60, 65, 66, 160, and 266.

Prior to the enactment of Title III, a voluntary Chemical Emergency Task Force, composed of representatives from both the public sector and private industry, began developing an emergency plan for the city of Springfield.

The plan developed by the task force was submitted to the City Council in October 1987.

The Springfield plan was subsequently converted to a countywide plan in keeping with the designation of Greene County as a local emergency planning district under Title III.

LEPC Organization. In the late spring of 1989, the LEPC stopped meeting when the LEPC Chair, the Director of the Springfield-Greene County Emergency Management Office, resigned.

To avoid the potential for another stoppage or slowdown in its activities, the LEPC began to develop a more formal organizational structure after its re-establishment in November 1989.

In June 1991, the LEPC published a document formalizing the structure and procedures which have allowed it to maintain a high level of activity over the last year and a half. LEPC membership is open to any individual who resides or works in Greene County.

All members are expected to serve on at least one of the following eight subcommittees:

- Education and Media: develops outreach materials explaining the purpose and goals of the LEPC;
- Data Collection: identifies facilities in compliance and provides assistance to facilities in meeting the requirements of Title III;
- Data Management and Public Inquiry: verifies and reconciles facility submissions and responds to citizen requests for right-to-know information;
- Assessment: evaluates the hazards posed by the storage, production, and use of chemicals at specific locations;
- Resources: identifies all available public and private resources for emergency response purposes;
- Medical and Health: addresses decontamination and emergency medical services issues, including training;
- Evacuation and Sheltering: identifies shelters and develops evacuation and in-place protection procedures; and
- Exercise and Evaluation: organizes exercises to test the emergency plan and evaluates exercise results.

The LEPC also has an Executive Committee, consisting of the heads of the eight subcommittees and the three elected LEPC officers (LEPC members elect a chairperson, vice-chairperson, and secretary every February). The Executive Committee's responsibilities include the approving amendments to the emergency plan; identifying gaps in the plan; reviewing information requests from citizens; and overseeing LEPC elections.

The full LEPC meets bi-monthly at the American Red Cross Center, with the Executive Committee meeting in the alternate months at the county Emergency Operations Center, where all LEPC records and information are maintained.

Subcommittees meet as often as necessary to achieve their objectives. To better schedule and track LEPC projects, minutes are published for all meetings - minutes for the Executive Committee and full LEPC meetings are mailed to all members; subcommittee minutes are distributed to all subcommittee chairs and LEPC elected officers.

LEPC Active in Other Community Projects

The varied membership of the Greene County LEPC includes representatives from local environmental projects such as the Watershed Committee and the Household Hazardous Waste Project. The LEPC, through various subcommittees, is working with the Watershed Committee to address potential contamination of the watershed from transportation and fixed facility incidents involving hazardous chemicals. For instance, information on sinkholes located along area highways will be entered into the CAMEO system to identify the sinkholes as possible avenues for watershed contamination in the event of a nearby spill. The LEPC is also coordinating with the Watershed Committee in developing legislation to require secondary containment at fixed facilities where chemicals, if released, could contaminate the watershed. For the Household Hazardous Waste Project, the LEPC assists in coordinating collection and publicity activities.

Information Management. In conjunction with the Missouri Department of Natural Resources (DNR), the LEPC developed a conversion program that allows them to download all the Title III submissions from Greene County facilities from the DNR mainframe.

This process avoids a redundant data entry and helps the LEPC's Data Management Subcommittee to identify companies that are reporting to the SERC and not to the LEPC or the local fire department, or that are reporting under some, but not all, of the required sections of Title III.

In the fall of 1990, the LEPC sent out a letter to over 100 facilities requesting the submission of information to the LEPC or the SERC to complete this reconciliation process.

Almost every one of these facilities have since come into compliance, and the publicity surrounding the, effort alerted several additional facilities that had previously not provided any information under Title III to its reporting requirements.

Continuing to optimize its data management system, in February 1991, the LEPC installed the IBM-compatible CAMEO-DOS system to manage their Title III information and planning efforts: CAMEO is the Computer-Aided Management of Emergency Operations system developed by EPA and the National Oceanographic and Atmospheric Administration.

Both the LEPC and the Springfield Fire Department are uploading information and the LEPC hopes to use CAMEO as a resource database and as a means of more accurately identifying vulnerable populations once this process is completed.

Hazards Analysis. To begin the process of identifying these vulnerable populations, the assessment subcommittee has examined over 50 facilities using a simple format developed by the LEPC to assess risk. The initial assessment collects information on the types, amounts, and locations of hazardous chemicals on-site, and potential exposure pathways and vulnerable populations.

In the next step, the fire department will review and validate these assessments based on the information collected during their annual fire inspections. The finalized assessments will be provided to the facility to serve as a means of initiating a dialogue with the LEPC on mitigating the potential for a dangerous chemical release.

Because the preliminary analysis by the assessment subcommittee indicates that chlorine is one of the primary hazards in the county, the next LEPC simulation exercise will address a chlorine incident.

Exercises. Meanwhile, the LEPC has participated in an evacuation and sheltering exercise in April 1990.with the American Red Cross, the Southwest Missouri State University, the Emergency Management Office, the Springfield Fire Department, amateur radio operators, and other agencies.

The exercise simulated coordinating of the evacuation and sheltering process. The participants -- university students and other members of the general public -- remained overnight at a local Red Cross shelter.

During the course of the evening, workshops were held on emergency preparedness issues for both the public and first responders.

An exercise critique held the next morning identified the need to develop clear procedures for the decontamination of potential exposure victims - two of the simulated victims had been transported to the local hospital without decontamination of their bodies and clothing.

The LEPC held a joint field exercise in April 1991, with the SYNTEX Agribusipess, Inc., facility involving the facility hazmat team and the newly organized Springfield Fire Department Hazmat Team.

The week before, a table-top simulation was held to familiarize the participants with the scenario. The incident involved a leak of phosphorus trichloride reacting with water to create phosphoric and chloride acids as liquids and vapors.

The exercise was designed to test both established emergency response procedures and the coordination among the various responding agencies. Two critical issues were identified:

- Limited equipment and insufficient procedures for decontaminating exposure victims by emergency medical personnel; and
- A lack of experience and understanding in making evacuation and in-place protection decisions.

These problems are being addressed by the appropriate subcommittees of the LEPC.

In addition, the two hazmat teams have established a cross-training relationship to resolve any procedural differences; the LEPC has also sent out letters to other private facility hazmat teams in hopes of developing similar arrangements.

LESSONS LEARNED

Lead Agency Can Provide Partial Funding for LEPC Activities. The Springfield-Greene County Emergency Management Office (EMO) recognized that the Title III mandate was consistent with its responsibilities under Missouri law to prepare the community for emergencies.

Thanks to the support of the Greene County Commission, EMO has become the lead agency for the LEPC, with its director serving as the LEPC chair. Funding for LEPC mailings and other support is supplemented through the annual EMO operations budget.

The EMO director suggests that other planning districts experiencing difficulty in funding their activities should consider coordinating their activities more closely with a local agency(ies). Many of the tasks associated with implementing Title III are already performed, and funded, by local fire, police, health, and civil defense agencies.

LEPCs Require Structure and Definition to Function. To effectively implement the Title III mandate, each LEPC must organize and establish specific operating procedures. LEPCs should design a workable system as soon as possible to serve as a functional basis for operations, and then let experience guide further developing the LEPC's structure and guidelines.

During its first years, the Greene County LEPC relied on the leadership of the EMO Director, and when he resigned, a period of inactivity followed.

Recognizing this structural flaw, during the November 1989 reorganization, one of the key steps taken by the members of the LEPC was to develop written procedures to prevent a recurrence of this type of situation.

Expanded LEPC Mission Increases Awareness. The Greene County LEPC realizes that by becoming involved in other community projects relating to chemical usage and environmental protection, it will be better able to fulfill its Title III mandate.

The LEPC’s work with the Watershed Committee, the Household Hazardous Waste Project, and local environmental groups has increased Title III awareness among the public and industry. In recognition of its achievements, the LEPC received the Missouri Department of Natural Resources' 1990 Resource Steward Award.

This award commends the LEPC for its outstanding efforts to promote safe chemical management in an effort to protect the citizens and natural resources of Greene County. The LEPC is now working with the Springfield Area Chamber of Commerce to gain funding for an informational brochure to be distributed to area businesses.

Compliance Efforts Should Rely First on Outreach, Not Enforcement. The Greene County LEPC has had notable success with a compliance policy which stresses assistance to local facilities in being aware of and complying with the requirements of Title III.

LEPC members believe that industry wants to be in compliance, and that by adopting an initial, enforcement-oriented approach, the LEPC will place facilities on the defensive and make them less cooperative with the LEPC.

State of Hawaii

SERC Profile

Membership: 15 members, including representatives from the Departments of Health, Defense, Labor and Industrial Relations, Business and Economic Development, and Transportation; Boards of Agriculture and Land and Natural Resources; University of Hawaii; American Red Cross; Office of Environmental Control; and the four Hawaii LEPCs.

Organization: 4 LEPCs representing the four Hawaiian counties

Topics: Information Management, Outreach, LEPC Organization, Training, Exercises

To improve Hawaii's chemical emergency planning and response capability and to streamline the collection of Title III data, the state has been a pioneer in the use of CAMEO (Computer-Aided Management of Emergency Operations) software developed by EPA and the National Oceanic and Atmospheric Administration (NOAA) to help local districts manage and use information about chemical hazards in their communities.

Hawaii's use of CAMEO includes an innovative new effort to take Title III awareness "to the streets" through a public information pilot program under an EPA grant. In addition to its use of CAMEO, the Hawaii SERC has conducted emergency response exercises and enhanced its hazardous material training.

The lead agency responsible for implementing Title III in Hawaii is the state Department of Health. The department's Office of Hazard Evaluation and Emergency Response (HEER) serves as the technical advisor for chemical incidents. HEER also dispatches response personnel to the scene of a chemical incident and has developed -- through a committee established by the SERC -- an oil and hazardous substance emergency response plan.

Civil defense agencies and fire departments manage Title III programs at the LEPC level.

Information Management. Hawaii is one of the first states to have a fully integrated Title III data management system using CAMEO software and Macintosh computers.

The CAMEO system- a powerful tool that presents the user with a wide array of databases, including information on chemicals, facilities, transportation, and even street maps to assist response personnel - is offered to state and local governments at cost through the National Safety Council. (A DOS version also is available for users with IBM-compatible machines.)

In Hawaii's Title III community, data is easily shared. Rather than having right-to-know information scattered around in different formats, all of the agencies with a stake in Title III have agreed to use CAMEO.

To get the most out of their CAMEO system, Hawaii has emphasized training programs for LEPC and SERC members who use the software, and has worked with chemical facilities to help them submit Title III data in a more consistent form.

As part of this training, the SERC instituted annual one-week CAMEO training courses, and sent one representative from each LEPC to a national CAMEO workshop.

EPA's Region 9, with the assistance of NOAA, also conducted two CAMEO courses in Honolulu, which were attended by representatives from all four LEPCs and the state Department of Health.

To provide general Macintosh training and more specialized instruction in the CAMEO program, a Hawaii data management workshop also was held.

Attendees were given a procedural manual, instructions on how to use it, and guidance on Title III topics such as enforcement and facility inspections.

The workshop also trained attendees in the use of FEMA's Hazardous Materials Information Exchange (HMIX), a computer bulletin board that include various categories of information on hazardous materials planning and response.

During the workshop, the participants discussed data flow within Hawaii's Title III community and identified potential problems.

As a result, a task force was established to address such issues as formatting Title III information so that all users enter data into the system in the same way.

A $50,000 Title III training grant from FEMA and funding from the state Department of Health cover training and travel expenses for the task force.

In addition, the SERC has conducted workshops in each county to help LEPC members and facilities learn more about hazards analysis, and to provide guidance in filling out Tier II forms and the "Hawaii Facility Profile."

This four-page profile addresses the storage of hazardous substances at each facility, as well as transportation routes, nearby facilities that contribute to potential risk, geographic features, climate, critical time variables (e.g. rush hours), and the facility's own response capability. These data all feed into the CAMEO system and can be used either for emergency planning and completing a hazards analysis or by response personnel at the time of an actual incident. This information can also be used by each LEPC for cross-referencing against existing files.

Follow-up Improves Compliance

The Hawaii SERC has found that getting facilities to fill out Title III forms completely and accurately is a vital first step in compiling a good database on chemicals in the community. In 1989, about 30 percent of the state's facilities submitted correct and complete Title III information for the CAMEO database. In contrast, the Title III submissions for 1990 have shown a great improvement, with 85 percent submitting correct and complete information. This achievement is in large part attributable to the thorough follow-up conducted for the 1989 submissions.

Each of these reports was reviewed, and a letter was written to each facility that had submitted an incomplete report. A follow-up phone call was made to those facilities that did not respond to the letter, and a final follow-up letter was sent to each facility that did not respond to the phone call. The HEER office then sent a mail-out reminder to all previous Title III submitters in February 1991 for the 1990 submission. The reminder letter included simple examples of a properly completed Tier II form, a list of common TPQs and RQs, a list of SERC and LEPC addresses, and an information hotline number.

Outreach. To enhance the usefulness of its Title III information, the Hawaii SERC recently received a $73,540 grant from EPA to develop a computer-based public information program. This will allow Hawaii's LEPCs to disseminate Title III data to the general public. The project includes public demonstrations of the Hawaii CAMEO system, installation at permanent public sites, training programs, a publicity campaign to inform the public about the program and Title III in general, and a survey to determine the effectiveness of this outreach. Under the grant, Hawaii also will produce a draft manual describing how the CAMEO system can be used by other states.

The project is now in the preliminary design phase. A contractor has been hired to develop a system that would allow any user to locate the chemical facility nearest them - perhaps using touch-screen computer displays - and to learn more about the chemicals at that facility.

LEPC Organization. Another central issue for the Hawaii SERC has been incorporating Title III administrative responsibilities into the emergency response structure that had been in place prior to the passage of Title III. A memorandum of understanding facilitated the transition from the pre-existing arrangement to a new, dual structure, whereby the civil defense agency handles natural disasters and the Department of Health handles oil and hazardous materials incidents. A 24-hour civil defense emergency notification hotline supports reporting of both types of events.

Each of the four Hawaiian counties - Hawaii, Maui, Oahu, and Kauai - has formed its own LEPC, but each has its own distinct character based on the emergency planning structure that had been in place before Title III. In all four counties, the director of the civil defense office is the active chair of the LEPC. Fire departments provide assistance to varying degrees. For example, in Kauai, a small county with only fifty facilities, the local fire department's eight-member hazmat team handles initial response, while civil defense officials are responsible for emergency planning and data management. But in Maui (a county composed of several islands), the fire department assumes both roles.

Training. For several years, the Oceania Regional Response Team -- the federal coordinating body for chemical emergency preparedness for Hawaii, Guam, and the Pacific Islands -- has been supporting the Honolulu Fire Department's efforts to develop a Level A first-responder hazardous materials response capability, the first such capability in Hawaii. The Coast Guard and other federal agencies have helped in this effort by providing training, equipment, and technical assistance. The goal is to have all four counties equipped with first-responder capability.

A $60,000 state grant and additional funds from FEMA are supporting hazardous materials training in Hawaii. Using this funding, a technical committee established by the SERC has developed training guidelines that meet or exceed the OSHA minimum standards. The document discusses four categories of hazmat training, ranging from short familiarization sessions to intensive courses:

- Hazardous Materials First Responder: An 8-hour "awareness course for emergency medical personnel, police, and highway personnel who might be confronted with a hazmat incident.
- Hazardous Materials Incident Response: A 40-hour course on personal protection for first responders.
- Hazardous Materials Supervisor: An 8- hour class for supervisors of response teams, taken in addition to the 40-hour incident response course.
- Hazardous Materials Specialist: A pair of FEMA courses for personnel entering a "hot zone. Two weeks are spent on hazardous materials chemistry and two weeks on tactical considerations.

Response exercises have been designed for personnel in all categories, and courses are offered once or twice a year with state funding.

Exercises. The Hawaii SERC, along with EPA, FEMA, and the state and county civil defense agencies, have co-sponsored a series of exercises that have proven valuable in highlighting potential emergency response problems. A full-field exercise was conducted in Honolulu, on the island of Oahu, and tabletop exercises have been conducted in Maui, Hawaii, and Kauai counties.

The main lesson learned from these exercises to date has been that response resources are inadequate outside of Oahu. At present, the Oahu emergency response team is the only one with full Level A response capability (including personal protective gear). When a chemical accident occurs on another island, the Oahu team can provide technical advice to initial responders until the Oahu responders arrive with Level A personal protection equipment. As a result of the exercises, each county now recognizes the need for an independent response capability to manage serious incidents until the Oahu team arrives, and Department of Health officials have become convinced of the need for additional personnel and equipment.

The exercises also identified communications issues relating to response coordination among agencies and between field and Emergency Operations Center personnel. One proposed solution is to equip all Department of Health district offices with cellular phones to ensure that there are no breaks in communication.

LESSONS LEARNED

Getting the Most From Title III Data. Hawaii's pioneering use of CAMEO to create a Title III information database, while still in the early stages, has already produced results, says Mark Ingoglia of the state Department of Health. "It's gotten everybody to pay attention to [the data], to clean it up and make it a tool, instead of just a box full of paper."

Cooperation Is the Key. In agreeing to set up a common data management system, Hawaii's LEPCs and SERC also have learned that working together has helped to identify common problems among the Title III community and foster an atmosphere conducive to developing solutions to these problems. For example, emergency response exercises conducted on islands (other than Oahu) have shown the need for each island's independent response capability, and the state, through the SERC, is supporting the development of these capabilities.

ARAPAHOE COUNTY, COLORADO

LEPC Profile

Membership: 18 members, including representatives from county government, law enforcement, local fire departments, county health department, emergency management, industry local television and newspapers, and private citizens.

Population: 400,000

Facilities: 578 reported under sections 302, 311, and 312, including chemical processors, laboratories, chemical distributors, explosives manufactures, food processors, water treatment plants, metal plating operations, and aircraft parts manufacturers.

Topics: Planning, Information Management, Hazards Analysis, Exercises, Outreach

Arapahoe County, in the suburbs of Denver, encompasses 14 different fire districts and five law enforcement jurisdictions. Arapahoe County includes several heavily used interstate highways, Lowry Air Force Base, and several major railroad systems. The largest municipality in the county, Aurora, was designated as its own planning district and has formed its own LEPC.

The Arapahoe County LEPC, operating through the Sheriff's Office, has formed two subcommittees to handle LEPC operations, the Emergency Response Subcommittee and the SARA Title III Compliance Subcommittee. The Emergency Response Subcommittee handles emergency planning, hazards analysis, and inter-jurisdictional issues, such as establishing mutual ' ' Arapahoe County, Colorado aid agreements. The SARA Title III Compliance Subcommittee is responsible for facility compliance, public education, outreach, and information management. The two subcommittees meet in alternating months and the LEPC as a whole meets at least annually.

Planning. The Arapahoe County LEPC emergency plan covers the jurisdictions of 14 different fire departments, many of whom have their own emergency procedures. To avoid duplicative or contradictory plans, the Emergency Response Subcommittee developed an umbrella plan for the entire county, focusing on inter-departmental coordination, chain-of-command structure, mutual aid agreements, and emergency communication procedures.

This umbrella plan also includes provisions for coordination and cooperation with neighboring LEPCs. The city of Aurora and the neighboring counties of Douglas, Jefferson, Adams, and Denver are all covered by the inter-jurisdictional provisions of the Arapahoe County plan. In addition, mutual aid agreements are in place between the Arapahoe County LEPC and these neighboring LEPCs. As a result of this inter-jurisdictional coordination, the Arapahoe County LEPC has access to almost 100 fully certified hazmat responders.

The Emergency Response Subcommittee's planning efforts are also supported by the State of Colorado's Uniform Fire Code, which mandates counties to adopt a fire code requiring the submission of a facility emergency response plan to the LEPC and the local fire department by all facilities required to report under sections 311-312 of Title III.

To help incorporate the facility response plans into the LEPC plan, Arapahoe County has developed the Facility Profile and Internal Contingency Plan form. Each facility is asked to provide information on the facility location, emergency coordinator and alternate(s), quantity of chemicals present, list of available material safety data sheets (MSDSs), evacuation distances for worst case accident scenarios, notification procedures, response capabilities, and vulnerable or sensitive populations near the facility. Each completed Facility Profile and Internal Contingency Plan is then incorporated into the LEPC's umbrella plan.

The completed Facility Profile and Internal Contingency; Plans are also used by the local frre departments in their code enforcement and emergency planning activities. In most cases, the local fire department and the covered facility work together to develop specific emergency procedures.

Hazards Analysis. When the LEPC receives the Facility Profile and Internal Contingency Plan, a facility identification number is assigned. With chemical information received from the facility or a computerized database, the LEPC uses National Fire Protection Association (NFPA) section 704 labelling standards, which rate, on a scale of zero to four, health, fire, reactivity, and chemical hazards of chemicals, to calculate overall facility hazard codes. The codes are then entered into the dispatch computer as part of the facility's identification information. When a call is placed to the Sheriff's Office, the dispatch officer is immediately able to provide first responders with general hazard information about the incident site.

The Facility Profile and Internal Contingency Plan forms are also examined by the LEPC to identify the facilities that present the highest likelihood of a chemical incident. The Emergency Response Subcommittee then identifies potential accident scenarios that could be simulated at these facilities in either a tabletop or field simulation exercise.

lnter-LEPC Coordination

An example of the successful coordination among neighboring LEPCs is the efforts of the Arapahoe County and City of Aurora LEPCs. Lowry Air Force Base is located in both the Arapahoe County and the Aurora emergency planning districts. By coordinating closely with each other and with Lowry, the two LEPCs were able to determine the resources needed from each district to supplement the Lowry resources for responding to a chemical incident at the base. As a result of this cooperative atmosphere, Lowry has offered the use of their resources, such as personnel, heavy fire fighting equipment, and evacuation equipment, to support emergency response actions undertaken by both LEPCs, including those not at Lowry Air Force Base.

Exercises. The Arapahoe County LEPC conducts exercises to test emergency response procedures, to encourage facility compliance with Title III, and to make facilities more aware of the hazards present at their sites.

As a result of the hazards analysis process mentioned above, a large manufacturing facility was identified as a location for a potential field simulation because of the large quantities of chemicals stored on site. The facility agreed to participate in the exercise and helped stage the incident using facility staff and equipment.

The simulated incident involved a truck that, during unloading, rolled into a nearby tank farm and ruptured two storage tanks, releasing plumes of chlorine and ammonia into the atmosphere.

The company's emergency responders coordinated with the local first responders in the simulated response. The mutual aid, emergency communications, and transportation elements of the LEPC plan were tested by this exercise.

As a result, the facility recognized that the staged truck incident represented a realistic scenario and, subsequently, better isolated the loading dock area from the tank farm.

The LEPC determined that the communication procedures established in the plan were inadequate. Although the plan included effective procedures for coordinating vehicles and equipment during a response, the number and type of vehicles were inadequate for evacuating large numbers of people, especially at nursing homes. Since the exercise, the emergency plan has been revised to improved communication procedures and, with the help of Lowry Air Force Base, to increase the numbers and types of vehicles available for evacuations.

The list of high-risk facilities is again being reviewed for a possible exercise in late summer 1991. One possibility being considered for the next exercise is a transportation incident along the Interstate 70 corridor.

Interstate 70 is a heavily travelled commercial route with a history of chemical incidents. This exercise will utilize the LEPC's new computerized information management system.

Information Management. To improve access to Title III information, the Arapahoe County LEPC is implementing a computerized information management system to be used in the field by first responders.

The computerized system consists of two parts, a computer-aided design (CAD) dispatch system and Macintosh personal computers equipped with the Computer-Aided Management of Emergency Operations (CAMEO) software package.

The CAD dispatch system is used by the Sheriff's Office to track locations and activities of patrol cars and consists of a computerized city map and tracking system.

The CAMEO software system was developed by EPA and the National Oceanographic and Atmospheric Administration to assist emergency planners and first responders with their

Title III information management, response, and planning activities.

When the first responders reach the incident site, they can use a Macintosh computer, a cellular phone, and a fax modem to access the CAMEO database maintained by the LEPC in the Sheriff's Office.

In addition, first responders can phone or radio the dispatch officer to request that MSDSs or facility maps be sent via the fax modem to the responder's computer screen. Although this information management system has been tested by the LEPC, it has not yet been used in an actual response situation - the proposed exercise represents its first real challenge.

Outreach. To inform first responders, facilities, and the general public about the requirements of Title III, the Arapahoe County LEPC developed a series of fact sheets designed for different groups.

Each fact sheet explains the purpose of Title III and the general reporting requirements.

The fact sheet for the general public includes additional information about how the Title III data are made available to the public and how to use the data to identify chemical hazards in the community.

The fact sheet for first responders includes additional information about the usefulness of Title III information to planning and response activities. The fact sheets for private-sector and state and local government facilities include more specific information about the reporting requirements and applicable reporting exemptions.

All potentially covered facilities are provided the appropriate facility fact sheet as part of an information packet, which also includes the Facility Profile and Internal Contingency Plan form and the Arapahoe County LEPC-developed version of the Tier II form and instructions.

The Arapahoe County LEPC routinely places articles in newsletters and LEPC members attend meetings of homeowner, community, and special interest groups to foster awareness of Title III, the role of the LEPC, and chemical hazards in the community.

One such special interest group is the "Interstate 70 Corridor Group." This group consists of first responders from businesses, law enforcement, and local fire Page20 Arapahoe County, Colorado Successful Practices departments which meets monthly to discuss issues such as chemical incidents and traffic control.

On several occasions, members of the Arapahoe County LEPC have responded to incidents along I-70 and, as a result, the I-70 Group is being approached to participate in a possible transportation-related exercise in late summer 1991.

Compliance. Rather than use limited LEPC resources to conduct mass mailings, the Arapahoe County LEPC chose to use an existing fire inspection program to disseminate Title III information, identify subject facilities, and encourage compliance with the provisions of Title III.

Under Colorado's Uniform Fire Code, local fire departments in Arapahoe County regularly identify and inspect both new and existing facilities in their jurisdictions for potential fire hazards.

Many provisions of the Uniform Fire Code parallel the requirements of Title III. For example, the fire code requires that MSDSs be submitted to the local emergency planning authority, which in Arapahoe County is the LEPC. Because the Uniform Fire Code is enforced at the local level, the Arapahoe County LEPC encourages compliance with the provisions of Title III by working with the local fire department to enforce the parallel provisions of the Uniform Fire Code.

During a fire code inspection, if a facility is identified as being potentially subject to Title III and has not reported to the LEPC, the fire inspector gives the facility owner/operator a copy of the facility information packet and records the receipt of the information and documents the violation in the inspection report

The identified facilities are reported to the LEPC Emergency Response Subcommittee monthly. Each facility not in compliance is contacted by the LEPC, which offers assistance in complying with the Title III provisions. The facility is then given two weeks (the time allowed to respond to a Uniform Fire Code violation) to comply with the provisions of Title III.

If nothing is submitted by the facility, the facility is contacted again by the LEPC with another offer of assistance and is given another two weeks to comply (per the Uniform Fire Code).

If no reports are then forthcoming, the Sheriff's Office informs the facility of the penalties for noncompliance (called a Hazard Notice). The facility is then given seven days and if no reports are submitted by the facility, a summons is issued for the facility owner/operator to appear before a judge to explain this lack of compliance and face possible fines and/or a jail sentence.

Violations of the Uniform Fire Code are misdemeanors with penalties up to $1,000 and/or a jail sentence of up to 12 months per violation.

In addition, every day a facility is out of compliance with the Uniform Fire Code (the time between when the Hazard Notice is received and the summons is issued) can be considered a separate violation under the Uniform Fire Code.

Therefore, a facility that does not respond to the Hazard Notice and receives a summons could be assessed penalties for a minimum of seven violations (one for each day between the issuance of the Hazard Notice and the issuance of the summons).

To date, the Arapahoe County LEPC has issued only two summonses for non-compliance with Title III. Both of these cases were settled out of court and the facilities are now in compliance.

Most of the facilities that do not immediately comply are unfamiliar with the requirements and need assistance to determine their reporting responsibilities.

LESSONS LEARNED

Piggyback on Existing Programs. Like many LEPCs, the Arapahoe County LEPC was faced with implementing and enforcing Title III on a small budget. Because of the LEPC's commitment to assist first responders by providing Title III information, the LEPC considers identifying all subject facilities very important.

Because many provisions of the Uniform Fire Code parallel Title III requirements, the LEPC is able to improve compliance with Title III by enforcing the Uniform Fire Code.

The local fire departments, with their extensive knowledge of facilities in their jurisdictions and their existing inspection program, provide the LEPC with an excellent resource for identifying facilities subject to Title III.

Through the innovative use of the Uniform Fire Code, the Arapahoe County LEPC is able to effectively bring facilities into compliance with Title.ID despite limited resources.

Provide the Tools, Improve the Results. When the Arapahoe County LEPC first approached the various local fire departments with their proposal to have firefighters identify facilities and distribute information about Title III, the proposal was met with much resistance.

The local fire departments already had plenty to do with their own jobs. The LEPC provided training to the firefighters on Title III and, more important, the LEPC illustrated the usefulness of the information collected under the Title III to improving the fire department's emergency response capabilities.

As a result, the local fire departments have become a very active and knowledgeable component of the LEPC's efforts to improve compliance with Title III.

Similarly, many facilities are wary of reporting requirements due to a lack of knowledge of the regulatory program.

By providing the facility information packets and continuous offers of assistance, the LEPC has not only increased the number of facilities in compliance, but also improved the quality of the information submitted.

Build on Existing Plans and Procedures. Prior to Title III, many organizations had developed their own emergency response procedures.

In Arapahoe County, the local fire departments had their own emergency procedures, the Lowry Air Force Base had a site contingency plan, and many facilities had standard operating and emergency procedures.

Rather than starting from scratch, the Arapahoe County LEPC decided to develop an umbrella plan to coordinate existing plans and procedures.

As a result, the Arapahoe County LEPC has conserved valuable resources and integrated facility-specific information into an LEPC plan that can be easily updated.

Because the LEPC umbrella plan coordinates existing plans and sponsors regular exercises, fire department and facility first responders are familiar with each other's procedures and their roles within the LEPC's umbrella plan.

Coordination Encourages Cooperation. A single local emergency planning district often does not have available all the resources necessary to respond to a large-scale incident.

The Arapahoe County LEPC recognized that, during an emergency, the county response resources may need to be supplemented.

The LEPC then began an active coordination effort with neighboring LEPCs, stressing not only what Arapahoe needed but also what Arapahoe could offer to assist them.

The Arapahoe County LEPC used the same approach when contacting subject facilities.

By taking the lead in coordinating neighboring LEPCs and facilities into their emergency plan, the Arapahoe County LEPC has successfully created an atmosphere of cooperation not only with neighboring LEPCs but also with facilities within the district.

Industry Must be Aware of Accidents Waiting to Happen. The Arapahoe County LEPC believes that field simulation exercises are important not only to test the provisions of the LEPC plan, but also to make facilities aware of chemical hazards at their sites and identifying ways to mitigate those hazards. The key is effective facility emergency planning to identify, prepare for, and prevent all possible hazards.

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SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

Natrona County, Colorado; Erie County, New York; State of Arizona; Mohave County, Arizona

ABOUT THIS BULLETIN

This is another in a series of bulletins that EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices -for example, planning, compliance, information management, hazards analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed in the box at the bottom of the first page of the profile for easy reference, along with descriptions of the planning district or state and LEPC or SERC membership.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. Each profile includes a contact person who can provide more detailed information.

NATRONA COUNTY, WYOMING

LEPC Profile

Membership: 39 members, including representatives from law enforcement, fire and rescue services, health department, education, industry, county and municipal government, emergency management, county agricultural extension office, news media, hospitals, American Red Cross, and private citizens.

Population: 61,000

Facilities: 20 facilities have reported under section 302, and 161 have reported under sections 311/312 of Title III, including petroleum production and refining facilities, chemical manufacturers, and utilities.

Topics: Compliance, Outreach, Exercises

The Natrona County LEPC, in coordination with EPA Region 8, has embarked upon a Title III outreach and compliance campaign throughout the county. The LEPC has made a concerted effort to educate both industry and the public about Title III. The committee holds at least two meetings per year, and has five distinct subcommittees which address plan modification and update, evacuation, community awareness, training and exercises, and response and preparedness.

The LEPC has a relatively large staff and a good working relationship with area businesses. The chair of the LEPC is the coordinator of the county Emergency Management Agency (EMA) and a law enforcement officer in the county sheriff's office in Casper-the county's largest city with a population of nearly 47,000. This situation has resulted in the EMA taking a leading role in Title III implementation for Natrona County.

Compliance. Before an outreach and compliance program could begin, the Natrona County LEPC needed to identify facilities within the county that must report under Title III. With assistance from the U.S. EPA Region 8 office in Denver, the LEPC began to target facilities using several methods. First, the LEPC identified a number of facilities simply by using the business section of the local telephone book and by visiting facilities listed under subjects related to gasoline and chlorine use. In addition, the LEPC identified possible reporters using computerized data bases provided by the EPA regional office. These data bases included the names of facilities on the Resource Conservation and Recovery Act (RCRA) Notifiers List, the List of Registered Underground Storage Tanks (USTs), and the section 313 Toxic Release Inventory (TRI) reporting list. By crossing out the names of facilities listed in these data bases that were out of business, the Natrona County LEPC was able to compile a target list of potential Title III reporting facilities that had reported under the requirements of other statutes.

Because fire fighters are often familiar with the types of chemicals in use at a facility, and may also have an established relationship with facility management, fire departments can be another valuable source of information about potential Title III reporters. The Natrona County LEPC has supplied local fire departments with Title III information packets to deliver to companies during scheduled fire safety inspections. The packets include a list of Title III reporting requirements, a list of Title III contacts and telephone numbers, and a cover letter asking companies to supply a list of their chemicals to the LEPC to determine if the facility is required to report. Through close coordination with local fire departments, the Natrona County LEPC was able to reach a larger audience with its Title III message than might otherwise have been possible. Following these initial efforts, the Natrona County LEPC compiled a list of facilities identified through the use of the data bases, telephone books, fire department inspections, and other sources. The LEPC then carefully reviewed the list, eliminating all duplicates and business closures, and concluded with a list of 260 potentially covered facilities that had not reported under Title III. To each facility on the list, the Natrona County LEPC sent a letter that included a Title III fact sheet, a response postcard, and phone numbers for questions. The response postcards presented the facility representative with four response options: (1) reported under Title III; (2) aware of Title III, but do not need to report; (3) uncertain if need to report; and (4) have questions on Title III and would like to attend an informational meeting to discuss reporting requirements. Along with these materials, the initial package included a list of Federal Register notices concerning Title III; FEMA and EPA publications on Title III; and information on Natrona County's hazardous materials planning efforts.

Prior to these compliance efforts by the Natrona County LEPC, 89 facilities had reported under various sections of Title III. Within 90 days of sending the initial letters and response postcards to the facilities, the Natrona County LEPC received 20 new submissions of Title III reports, and identified an additional 64 facilities who appeared to be required to report. Follow-up letters were sent to those facilities that did not respond to the initial information package. As of March 1992, compliance efforts resulted in 72 additional facilities reporting under Title III (for a total of 161 facilities), an increase of more than 80 percent.

Information Management

Several agencies in Natrona County and the City of Casper are in the process of improving the 911 emergency center by installing a computer-aided dispatch system. This system would send Title III information by modem from EMA's Emergency Information System (EIS) software package, which stores chemical, facility, transportation, and other planning and response information, to the 911 system. When installation of the improved dispatch system is complete, first responders will have information on buildings and stored chemicals before they enter the premises. For field operations, the Natrona County EMA and LEPC used emergency management funds to purchase a laptop computer that can access information from the EIS software in the main office. Use of this new computer will provide facility-specific information to the EMA in the field for both emergency and non-emergency situations.

To improve its software capabilities, the Natrona County LEPC has installed dBase IV in addition to the EIS software on their office system. When the annual Title III reports come in, the LEPC adds the contents of each form to the office system. Currently, the Natrona County LEPC is planning to expand this information system to increase the amount of data, and make it more accessible to other agencies. To supplement this information, the LEPC also remains in close contact with the Casper Fire Department, which uses the Computer-Aided Management of Emergency Operations (CAMEO) software to aid in emergency planning and response to hazardous material accidents.

Outreach. Because some facilities either misunderstood the Title III reporting requirements or ignored them, 'the Natrona County LEPC developed and conducted a workshop for industry to explain requirements and issues associated with Title III reporting in more detail. The workshop covered a variety of topics, including business confidentiality, release notification procedures, compliance with Title III sections 311 and 312, facility emergency planning, and civil and criminal penalties. To publicize the workshop, the LEPC issued several press releases for publication in the local newspaper and promoted the workshop at several emergency exercises in which industry participated. Facilities for the workshop were obtained from the local Agricultural Extension Office free of charge. The Natrona County LEPC provided numerous informational materials at the workshop. The LEPC customized copies of the Title III requirements to include names and phone numbers of representatives of the Natrona County LEPC and the Wyoming state emergency response commission (SERC). In addition, the LEPC compiled and made available a schedule of hazardous materials training courses offered by fire and police departments, hospitals, large local companies, and other organizations.

Other documents handed out at the workshop include OSHA guidelines on hazard communications standards; related worker right-to-know materials; EPA's List of Lists, detailing reporting levels for specific chemicals under various statutes; and other pamphlets and EPA publications obtained for free from the EPA regional office. At the request of industry representatives attending the workshop, the Natrona County LEPC has made its members available for one-on-one meetings to provide a more company-specific, personalized approach than is possible at a workshop. To date, the LEPC has conducted about 20 one-on-one meetings with representatives of potential reporting facilities and has found the meetings to be often more fruitful than the full-scale workshops.

Several success stories have resulted from these meetings. Following one such meeting, a bulk fuel distributor located in Casper provided the LEPC with a list of its hazardous chemicals, a site-safety plan, and a facility map detailing specific areas where each hazardous chemical is stored on site. This information was accompanied by an invitation to LEPC members to tour the plant for more information. Another successful one-on-one meeting involved the Parks and Recreation Department of the City of Casper. After meeting with the Natrona County LEPC, the Parks Department identified a number of facilities and locations operated by the city where fuels, fertilizers, herbicides, chlorine, and other drinking and waste water treatment chemicals were stored. The LEPC has remained in close contact with the Parks Department after the meeting, and has assisted department officials in filing thorough Tier II reports with the LEPC.

Exercises. Exercises conducted with the cooperation of industry, local responders, and the Natrona County LEPC have tested emergency response procedures while furthering the cause of informing industry and the public about Title III. Consider the following scenario. On the afternoon of September 17, 1990, just outside the gates of the Nalco Chemical Company on Old Glenrock Highway in Casper, the driver of a commercial transit bus suffered a heart attack, lost control of the vehicle, and sent the bus crashing into the side of a tanker truck containing thousands of gallons of flammable and corrosive liquids. Fortunately, this description is not from an actual occurrence, but from an exercise developed by the Natrona County LEPC in coordination with Nalco Chemical and various emergency responders.

Preparation for this exercise included working with the news media to videotape the event, consultation with participating emergency responders, and solicitation of an old tanker truck from Nalco Chemical. Personnel from the Nalco response .team, three fire departments, two ambulance services, and four law enforcement agencies responded to the "incident," and were directed at the scene by the EMA. Roadblocks were set along the highway with vehicles from the highway patrol and sheriff's department, and medical personnel treated about 20 "casualties" from the bus at the scene. Several lessons learned by participants in this and other exercises have shed light on the strengths and weaknesses of the local emergency response plan. Communication among responders was constant during the Nalco Chemical exercise, keeping response efforts organized.

Law enforcement personnel were able to prevent public access to the area surrounding the facility quickly and efficiently. Media coverage of the dramatic exercise has increased community and industry awareness of the Title III message; for instance, Nalco Chemical has since modified its tape of the exercise into a chemical safety awareness video for use in training new employees at all of the company's facilities. Lessons were also learned through response shortcomings. During the Nalco exercise, responders did not dedicate a specific area near the scene for on-site medical treatment or for transport of accident victims to local hospitals. Although public and emergency notification of the "accident" was timely, Nalco Chemical did not alert all of its workers to the exercise unfolding outside their building. Since the exercise, medical procedures for emergency medical personnel and hospitals have been modified and are now incorporated in the community emergency plan. In addition, Nalco Chemical has improved its procedures for alerting all employees to an emergency.

LESSONS LEARNED

Industry and Emergency Responders Must Be Informed and Involved. Outreach has been the foundation for all the work of the Natrona County LEPC. Its central goal is to deliver the message to facilities and to the emergency response community that Title III is everyone's responsibility. The more that an LEPC strives to deliver this message and the more members of the emergency response community become infoni1ed and involved, the better each responder will perform in an actual emergency.

The Natrona County LEPC Doesn't Like Surprises. Through exercises performed in conjunction with local industry and response personnel, the Natrona County LEPC has discovered some areas of vulnerability in its response plan and procedures that it has subsequently worked to resolve. By solving unexpected response problems during simulations and full-scale exercises, the Natrona County LEPC has helped to prevent unwanted surprises from hampering responders during actual emergencies.

ERIE COUNTY, NEW YORK

LEPC Profile

Membership: 30 members, including representatives from local and county emergency services, fire safety, emergency medical services, environment and planning, civil defense and disaster preparedness, and police, sheriff, fire, and health departments; state senate; media; Niagara Frontier Transportation Authority; hospitals; Citizen's Action Organization; private citizens, including medical and legal professionals; and industry (chair: industry representative).

Population: 969,000

Facilities: 834 reporting under section 312, and 175 under section 302, including communication centers, sewage and waste water treatment facilities, ice rinks, and manufacturing, warehousing, and cold storage facilities.

Topics: International Coordination, Exercises, Training, Emergency Response

Erie County is located in western New York, south of Niagara County and sharing a border with the Regional Municipality of Niagara, Province of Ontario, Canada, along the Niagara River. The largest community is Buffalo, with a population of 334,000; there are also 25 towns, 16 villages, and two other cities in the county.

Erie County has a full-time LEPC coordinator, the first appointed in the state, although administrative support is provided by the Erie County Department of Emergency Services' (DES) Office of Disaster Preparedness and the Erie County Department of Environment and Planning.

International Coordination. The region consisting of Erie County, Niagara County, and the Municipality of Niagara has considerable transportation and use of hazardous materials, which translates into an ever-present threat around and across the international border. For example, on November 11, 1979, a train with alternating rail cars of propane and chlorine derailed and caught fire near the city of Mississaugua, in the Province of Ontario, Canada, requiring the evacuation of 240,000 residents over several days, one of the largest evacuations in North American history. Recently, in December 1989, a ship went aground in the Buffalo Harbor carrying over 600,000 gallons of toluene, a carcinogen. Lastly, in May 1990 the plume of a chemical release from Rich Products in Buffalo was detected across the border in Canada.

Recognizing the potential for a disaster in the border region, the United States and Canada signed an Agreement on Cooperation between the United States and Canada on Civil Emergency Planning in August of 1986. Meanwhile, also prior to the passage of SARA Title III, attempts were being made to establish a joint disaster planning effort between Erie County, the City of Buffalo, Niagara County, and the Province of Ontario.

During the next two years, after reviewing hazardous substance inventories obtained under Title III, local officials recognized that the existing planning effort had to be intensified. Because a variety of issues relating to immigration, customs, and border bridge authorities needed to be examined to determine how to coordinate cross-border response activities, an International Joint Committee on Emergency Planning was formed, consisting of representatives from LEPC member agencies in Erie and Niagara counties, and similar agencies in Ontario.

The first product of the international committee emerged on March 15, 1989, when the Regional Municipality of Niagara, Ontario, and the Counties of Erie and Niagara signed an agreement addressing emergency planning and response for major incidents or disasters that would impact any of the border communities. The signing of this agreement, however, was just the first stage in the international coordination process. A variety of planning sessions, training programs, and meetings have been held with the local law enforcement community, fire service personnel, emergency medical and health officials, social services agencies, customs and immigration people, bridge authority commissioners, the military, and various other response groups.

The coordination process continued in 1991 with the signing of a Memorandum of Understanding that defines the guidelines and parameters for the unimpeded and mutual use of manpower, equipment, and other resources during emergencies that would affect any portion of the border area between Canada and Erie and Niagara counties.

The agreement is designed to improve public safety for citizens on both sides of the border by providing an effective, immediate response to any major emergency or disaster. It also ensures that the current federal and state (and provincial in Canada) benefits provided to police officials, firefighters, and other emergency responders (e.g., death benefits, worker's compensation, etc.) are continued when they are engaged in emergency response operations on either side of the border, and delineates financial responsibilities for damage to equipment and use of manpower. Standard operating procedures for the implementation of the Memorandum of Understanding are incorporated in a cross-border contingency plan that serves as an annex to the existing contingency plans in the three participating areas.

The signing of the international agreement kicked off the planning for a major exercise, Operation Big 3 (Disaster Exercise), held on September 14, 1991. This massive exercise at the Greater Niagara Falls International Airport was designed to test the effectiveness of the Memorandum of Understanding and all the unique planning efforts that went into the international agreement.

The exercise was a simulated air disaster involving approximately 450 casualties, 50 hospitals, and well over 3,000 participants, including the Erie County Health Department and the Department of Emergency Services, and a variety of American and Canadian response agencies -- law enforcement, emergency health and medical responders, fire service, and airport response teams - as well as many other support groups. This exercise also activated the United States' National Disaster Medical System, which supplements and assists local governments' medical resources when they are overwhelmed by the magnitude of any incident or disaster.

Exercises. In addition to international coordination, over the past few years the Erie County DES and the Crash/Fire/Rescue Division at the Greater Buffalo International Airport have been working together in an attempt to enhance response capabilities in the event of an air disaster.

Because over 90 percent of air disasters occur off airport property, planning exercises, meetings, and seminars have brought together a great number of organizations that must interact in the response to an air disaster or any other type of mass casualty incident. A series of exercises, both full scale and table-top, have been conducted through the joint efforts of airport authority and Erie County DES. One of the largest of these exercises was "Orbit Sage '89 ," a mass casualty simulation that was conducted simultaneously in Erie County and at other locations in New York, Pennsylvania, Connecticut, and Canada. The achievements of the air disaster planning process were formalized with the signing of the first mutual aid agreement between the airport authority and the local volunteer fire departments.

On October 11, 1990, DES and Crash/Fire/ Rescue Division conducted a second mass casualty exercise with the National Disaster Medical System, involving a number of federal, state, and local agencies. The scenario simulated the reception of victims in Erie County from a massive earthquake, occurring along the Madrid Fault, in Arkansas, where seismographic data predict that an earthquake will occur in the future. In this table-top exercise, earthquake victims received triage at the airport and were then sent to a variety of area hospitals, including Canadian facilities. The existing provisions of the international agreement were activated and proved to be a tremendous asset to the county, triggering the involvement of local Canadian emergency planners, hospitals, communications, law enforcement agencies, and other resources.

Training. To further expand the emergency exercise program, the LEPC recently began implementation of the Public Safety Critical Incident Management system, a tabletop, emergency simulation methodology. First developed in Monroe County, New York, the system involves the use of simulator boards (HO-scale models of communities originally. designed for training police personnel and thus easily adaptable to general emergency response scenarios}.

The simulator board system is used to examine operational concerns and responsibilities of participating response organizations under a unified emergency operations command structure. A 16-hour training course, consisting of lectures and exercises, is offered through the New York State Emergency Management Office to fire, emergency medical services, police, and business and industry representatives. The LEPC has already conducted a train-the-trainer workshop for 32 local fire, emergency medical, and police officials, and hopes to disseminate the system to personnel from local response · agencies through community colleges.

Settlement of Citizen Suits

The settlement of several citizen suits filed under section 326 of Title III has provided funding for various local emergency planning and response efforts in Erie County, including the county response team, outreach activities, and contingency planning. On December 11; 1990, agreements were reached in the first two cases settled nationally under the citizen suit provisions of Title III. After a review of the TRI database and the sections 311- 312 submissions from ARO Corporation of Buffalo and Murray Sandblast and Paint Company of West Seneca, the Atlantic States Legal Foundation filed citizen suits alleging that these companies had failed to meet the annual release reporting requirements of section 313 for 1987and1988. Under the settlements, ARO Corporation agreed to pay $34,000, and Murray Sandblast agreed to pay $10,000 and institute a pollution prevention and toxics use reduction program.

A third citizen suit filed against Allied Signal, Inc., of Buffalo also alleging section 313 violations was settled on January 3, 1991. Allied Signal agreed to pay a penalty of $17,000 (of which $13,500 will be given to the Erie County LEPC) and also to comply with section 313 requirements for the 1990 reporting year and beyond. Altogether, the LEPC has received approximately $50,000 in these and other citizen suit settlements to finance the Erie County Hazardous Materials Organization.

Emergency Response. To support the efforts of response agencies in communities both with and without their own hazmat team, the Erie County Hazardous Materials Organization was formed. This all-volunteer hazmat response team operates under the direction of DES, and provides technical, command, security, and decontamination assistance. The team has full Level A response capability and is available for response to any area without a hazmat team or to assist an existing hazmat team. The organization does not take control of incidents to which it is called; command control remains with the local incident commander. The team is available via a 24-hour hotline and does not bill municipalities or fire departments for the costs incurred at an incident.

Instead, the team bills the responsible party- the transporter, the facility owner, or the product manufacturer. In addition, the county has funded the purchase of a Mobile Command Post, equipped with a CAMEO system loaded with 750 facility reports, and several local companies have donated response equipment (e.g., a decontamination tent and emergency breathing apparatus) and provided equipment maintenance services to support the team's efforts.

Following a chemical fire in 1987, in which several firefighters were injured, the LEPC began formally addressing the decontamination of chemical accident victims. First, the LEPC's Hospital Subcommittee conducted a survey of all Erie County hospitals to determine their current ability to manage the decontamination process in emergency rooms. All 15 local hospitals were evaluated, and the LEPC established a set of final decontamination protocols, which have since been distributed to the hospitals through the Western New York Hospital Association.

In addition, emergency room personnel from several area hospitals have received training in conjunction with the county's mobile decontamination unit described below. Erie County has also funded the purchase of a 35-foot trailer equipped with a portable decontamination unit. This vehicle allows firefighters to be decontaminated on location before being sent by ambulance to a hospital, thus eliminating the potential of contaminating ambulances or emergency rooms. During its first year, the Erie County Hazardous Materials

Organization used the trailer to assist in decontaminating firefighters and other personnel at four separate incidents.

LESSONS LEARNED

International Coordination Follows Path of LEPC. Many of the issues related to developing and implementing the international agreement follow the trail blazed by the Erie County LEPC. The initial success of the international agreement along the border between New York and Ontario can be traced to the same cooperative spirit that supports the Erie County LEPC, carried out on a greater scale with literally scores of participating entities. In addition, the creation of a cross-border forum has been critical in the planning for the 1993 World University Games, to be held at locations in Erie and Niagara counties as well as in the Province of Ontario. The existing coordination structure has simplified the development of contingency plans for these events, which will feature athletes from 120 countries and an estimated 500,000 visitors.

Exercise Pays Off. As a direct result of the ongoing planning between the LEPC and the Crash/Rescue/Fire Division at the Greater Buffalo International Airport, the airport was able to assist the county during a major gasoline leak on November 10, 1990. Responders feared that activities to locate and fix the underground leak might ignite the gasoline, so the airport provided foam trucks to lay a field of foam over the gasoline-affected areas in West Seneca. This protective action minimized the danger of an explosion that could have injured neighbors, motorists, and emergency responders, and also speeded activities to protect the environment from further gasoline contamination.

Facilities are Partners, not Targets. Beyond their direct support for the Erie County Hazardous Materials Organization, industry in Erie County has become increasingly involved in the preparedness activities of the LEPC, going well beyond the submission of emergency planning information. This willingness is further demonstrated by the selection of an industry representative, rather than the usual emergency management or other public official, to serve as the chairman of the LEPC. In addition, an industry hazardous materials advisory council has expressed interest in sending facility personnel to participate in the Public Safety Critical Incident Management System.

STATE OF ARIZONA

SERC Profile

Membership: Director of the Arizona Division of Emergency Management and directors or designees of the Arizona Departments of Environmental Quality, Health Services, Public Safety, and Transportation. An advisory committee to the Commission consists of the State Fire Marshal, the director, chief administrator or designee of the Department of Agriculture, Corporation Commission, Industrial Commission, Arizona Radiation Regulatory Agency, State Mine Inspector, two representatives nominated by the Arizona Fire Chiefs Association, and four private sector representatives.

Organization: 15 LEPCs representing the 15 Arizona counties

Topics: Outreach, Training, Compliance, Indian Tribes, International Coordination

The Arizona Division of Emergency Management (ADEM) is designated by state law as the lead agency for implementing Title III. The hazardous materials staff of ADEM is the support arm of the SERC for implementing and performing commission duties and activities, and for integrating EPCRA with the state hazardous materials emergency management program. This is accomplished through the SERC Executive Director who is also the Assistant Director for Hazardous Materials within ADEM. The SERC normally meets three times a year.

The Arizona SERC organized the LEPCs by the 15 county jurisdictions. Emergency management directors/coordinators are a State of Arizona integral part of LEPC operations and chair the committees in 10 of the 15 jurisdictions.

The SERC/ ADEM conducts outreach to build positive relationships among LEPCs, industry, Indian nations, and other groups in the state. Through extensive seminars and workshops, the SERC/ADEM keeps industry and the LEPCs up to date on Title Ill requirements and changes in the law. The SERC/ADEM stays "on the road," assisting industry during section 313 compliance inspections and chemical safety audits conducted by the U.S. Environmental Protection Agency (EPA), and offering its assistance to Indian nations and to cities along the Arizona/Mexico border as they develop emergency management strategies. The SERC/ ADEM has found that the best way to meet its Title III responsibilities is through regular communication and outreach to LEPCs and all groups in the state involved in hazardous materials emergency management.

Outreach. In 1991, the Arizona SERC/ADEM sponsored approximately 20 Title III seminars, lectures, and workshops. Several of these were developed in conjunction with the Center for Environmental Studies at Arizona State University (ASU). The topics of the seminars range from compliance issues to emergency planning. Industry personnel, government personnel, and other professionals involved in emergency management depend on these programs for accurate and up-to-date information on environmental regulations.

One series of Title III seminars held in conjunction with ASU that began as a half-hour presentation at a Resource Conservation and Recovery Act (RCRA) seminar in 1989, has since become a full-day presentation given twice a year. In November 1991, for example, the SERC/ADEM and the Center for Environmental Studies sponsored a one-day Right-To-Know "refresher course." The seminar was open to government staff, facility representatives, emergency services personnel, professionals from the safety, health, and environment sectors, and the public. Lectures and discussion sessions covered all aspects of Title III.

One of the SERC/ADEM's innovative techniques is incorporating the Emergency Planning and Community Right-to-Know Information Hotline into the seminars, giving seminar attendees the opportunity to experience the hotline first-hand. At a specified time during the seminar, a hotline information specialist calls the seminar and briefly explains the purpose of the hotline. The audience then has the opportunity to ask questions of the specialist regarding use of the hotline. This informal introduction exposes seminar participants to the hotline and increases the likelihood that they will use the hotline in the future.

For three years, the SERC/ ADEM has sponsored half-day Title III section 313 workshops following the jointly sponsored ASU seminars. The workshops, conducted with representatives from EPA, give industry representatives and the public an opportunity to discuss section 313 requirements with both federal and state officials. Topics covered during these workshops include changes to Form R reporting requirements and the new Pollution Prevention Act requirements.

Other Title III seminars and workshops are sponsored jointly by the Arizona SERC/ADEM and the EPA Region 9 office. In 1990, for example, the SERC/ADEM, EPA Headquarters, and EPA Region 9 conducted two hazards analysis workshops in Arizona for over 100 LEPC representatives, industry personnel, and fire fighters. The workshops stressed the importance of each facility conducting its own hazards analysis with the public sector also conducting a community-based analysis. The philosophy behind this approach is that, although facilities may know more about chemicals they store or use, the public sector has greater overall knowledge of the makeup (e.g., sensitive populations, ecosystems) of the community.

Participants at the workshop learned to use the Technical Guidance for Hazards Analysis, also known as the "Green Book" as a tool for conducting community-based hazards analysis. The participants completed worksheets about chemicals in their communities before coming to the workshop and then were able to work out "real life" problems with the help of the SERC/ ADEM and EPA representatives. The workshop not only provided an introduction to community-based hazards analyses, but also prepared participants to conduct full-scale hazards analyses on their own. In addition, the workshops also provided a basis for participants to use hazards analysis data incorporated in the Computer-Aided Management of Emergency Operations (CAMEO) DOS program.

Additional SERC/ADEM-sponsored workshops for the Arizona LEPCs cover topics such as risk communication, liability, emergency management, CAMEO, and the Aerial Locations of Hazardous Atmospheres system (ALOHA) -- an air dispersion model that allows the user to estimate the movement and dispersion of an air release. In an effort to keep the LEPCs up-to-date, the SERC/ADEM offers financial assistance to the LEPCs for transportation to the workshops and always encourages them to attend.

Information Management Using CAMEO DOS

Following the initial development of CAMEO DOS -- a computer system that provides a wide variety of databases, including information on facilities and the chemicals they store, transportation; and local street maps to assist emergency responders –the Arizona SERC/ADEM was selected by EPA to be a "beta test" site for the CAMEO DOS software. Upon successful completion of the beta test, the SERC/ ADEM elected to implement CAMEO at the state and LEPC levels. The CAMEO DOS software as well as additional computer hardware were purchased to provide each LEPC the equipment necessary to work with their respective county map file and planning data. The SERC/ADEM has created maps for each of the LEPCs jurisdictions using the MARPLOT conversion program and the U.S. Census Bureau's CDROM TIGER/line files. The maps can be used to present a street-by-street identification of sensitive populations and the locations of hazardous chemicals.

To expedite establishing a statewide CAMEO system, EPA assisted in developing an import program to convert Arizona's existing database into CAMEO. This program converted all the Title III data received prior to 1990, which covered some 3,500 facilities and over 5,000 chemicals. An additional 1,700 facilities filed in 1991 and were incorporated into the database. The LEPCs and all state emergency response organizations receive their jurisdictional information via diskette. Fire departments can obtain this information by contacting the SERC/ ADEM or the LEPC in their area.

In October 1991, the SERC/ ADEM conducted a CAMEO DOS train-the-trainer course. Two members of the SERC/ADEM and seven emergency responders from fire departments from around the state attended. These individuals are now available to provide training throughout the state. Following the train-the-trainer course, four two-day "Introduction to CAMEO DOS" courses were conducted in 1991. Students in the introduction courses included personnel from the LEPCs, state emergency response organizations, and various fire departments that also have CAMEO. In all, over 45 personnel were trained for the five courses.

This year, the SERC/ ADEM will conduct two CAMEO DOS introduction courses. There will also be three CAMEO DOS advanced workshops that will include training on the Aerial Locations of Hazardous Atmospheres (ALOHA) system.

Training. Training is another key element to · supporting LEPC and local emergency response personnel. As of June 30, 1992, the Arizona SERC/ ADEM conducted and/or sponsored 172 hazardous materials emergency response training activities reaching 3,286 students statewide.

A two-person training staff and a cadre of part-time state certified instructors are responsible for preparing Arizona's responders for hazardous materials incidents.

Arizona's courses are consistent with the training requirements of 29 CFR 1910.120 (q) and with the National Fire Protection Association's Professional Standard 472. First Responder Awareness, First Responder Operational and Technician courses are the most requested training activities. In addition, the SERC/ ADEM sponsors emergency response courses offered locally by EPA.

Arizona recognizes the importance of supporting the needs of emergency responders by providing training, by making them part of the planning process, and by providing them with facility data. The SERC/ADEM coordinates all these elements to ensure that, emergency response personnel are prepared to protect the public, the environment, and themselves.

Compliance. The majority of the SERC/ADEM's outreach efforts are geared towards helping industry in Arizona meet the requirements of Title Ill. A primary objective of the SERC/ ADEM is to "soften the blow" of Title III reporting requirements by offering assistance and education to facilities covered by the law.

For example, the ADEM Title III coordinator is present at facilities during section 313 compliance inspections conducted by EPA.

The Title III coordinator assists facilities by answering questions, interpreting the law, and helping assemble the documents needed by the inspector.

This methodology gives the SERC/ ADEM an opportunity to talk with facility managers and be sure the managers know what is expected of them under all parts of Title III, not only section 313.

Another way the SERC/ADEM has helped ease the burden of Title III reporting for industry is by modifying the federal Tier II reporting form to better fit the needs of industry in Arizona.

The SERC/ADEM rewrote the instructions for the form and removed any reference to the Tier I form, since the Tier II is mandated in Arizona. The new instructions include local phone numbers that facilities can call with questions about Tier II.

The SERC/ ADEM also developed a Tier Report Error Notification Data Sheet (TRENDS) that identifies any error(s) on the Tier II submissions.

The Tier II report and TRENDS package is returned to the submitter who is directed to the appropriate portion of the instructions to correct the error(s) or asked to contact the SERC/ADEM staff for guidance.

The facility then resubmits its corrected Tier II to all reporting agencies and is better prepared for submitting accurate reports in the future. "Helping people not make errors" is the SERC/ADEM's objective, says Dan Roe, the Title III coordinator.

The SERC/ADEM also participates with facility visits conducted under EPA's Chemical Safety Audit (CSA) program. The CSA program is designed to heighten awareness of the need for chemical safety among chemical producers, distributors, and users.

Chemical safety audits consist of interviews with facility personnel and on-site reviews of various aspects of facility operations related to the prevention of accidental chemical releases.

A representative from the Arizona SERC/ADEM has accompanied the EPA audit teams on every chemical safety audit conducted in Arizona in order to assist facilities and EPA during the audits.

The SERC/ ADEM representative visits facilities before an audit is conducted to go over the audit process and to encourage the facility to prepare a briefing for the audit team.

Briefings generally provide an overview of the facility, its chemical processes, and other operations such as shipping, and receiving practices and storage methods.

All Arizona facilities that have been audited have prepared a briefing that has assisted the facility, the audit team, the LEPC, and the SERC/ADEM by providing background information about the facility's management of chemical process safety.

Indian Tribes. Arizona outreach efforts also extend to Indian nations. The state is home to 20 Indian nations with a wide variety of privately-owned industries located on their land.

While some Indian nations or tribes have the capability to handle emergency response independently, the state hazardous materials emergency response team from the Departments of Public Safety and Environmental Quality will respond to emergencies at an Indian nation's or tribe's request.

The SERC/ADEM is very interested in maintaining a partnership with the Indian nations as they develop strategies for implementing Title Ill.

At one tribe's request, the SERC/ADEM met with tribal leaders to discuss Title III and hazardous materials emergency preparedness so that, as one SERC/ADEM representative said, "the tribes don't have to reinvent the wheel."

These meetings also provide an opportunity for the tribes and the SERC/ADEM to exchange information on chemicals stored at facilities within the reservations and on the periphery of their boundaries.

Such an exchange benefits both the tribes and the SERC/ADEM as they develop or modify existing emergency response plans.

Emergency response exercises are conducted occasionally by the SERC on Indian reservations at the tribes' request. The SERC/ADEM recently assisted in conducting such an exercise at Peach Springs, on the Havasupai Reservation.

This was a table-top exercise based on a transportation accident involving hazardous materials.

Tribal leaders, the chair of the Mohave County LEPC (also the director of the nearby Mohave County Emergency Services Division), public safety officials, and others in attendance worked through the problems of handling the spill and coordinating the response among different agencies (e.g., hospitals, fire departments, police).

Exercises such as the one in Peach Springs increase the county's and tribes' awareness of the need for emergency preparedness and provide the opportunity to smooth out problems in response plans before real emergencies occur.

All in all, the SERC/ADEM's efforts to assist Indian tribes have been very well received.

The SERC/ADEM has worked directly with at least four tribes on emergency management issues. Two of the tribes have set up TERCs of their own and the SERC/ADEM is working to help other tribes do the same.

International Coordination. In addition to its involvement with sovereign Indian nations, the Arizona SERC/ADEM, in coordination with EPA Region 9, participates in outreach to communities along the U.S./Mexico border.

The SERC/ ADEM began working with EPA and the United States/Mexico Inland Join Response Team (JRT) over a year ago and the executive director of the SERC is a member of the JRT. The JRT coordinates preparedness and response activities for hazardous substance emergency incidents along the joint U.S./Mexico inland border.

The JRT is activated in the event of a significant hazardous .substance incident in the border area. Additionally, the JRT serves as a conduit for information about each country's hazardous substance emergency preparedness and response activities.

Emergency response planning for small spills along the border is handled by EPA, the states, and the 14 pairs of Sister Cities designated along the U.S./Mexico border. The Sister Cities work in pairs to plan emergency notification procedures and joint hazardous materials responses in the event of an accidental chemical release on either side of the border.

The Directors of EPA's Chemical Emergency Preparedness and Prevention office (CEPPO) and the Secretaria de Desarrollo Social (SEDESOL) serve as Co-chairs of the JRT. Other members of the JRT include regional EPA; federal and SEDESOL officials, as well as SERCs and LEPCs located in the border area.

The SERC/ADEM provides technical assistance to the four border towns in Arizona that are working on Sister City plans with their Mexican counterparts.

The SERC/ADEM recently held a Public Officials Conference for the Sister City pair of Douglas, AZ, and Agua Prieta, Sonora, to provide an orientation on hazardous materials emergency management programs and planning activities of the United States and Arizona. City managers, public works employees, and mayors attended the conference and learned about issues such as environmental laws, liability, Sister-Cities hazardous materials plans, and EPA and SEDESOL's roles in the JRT.

The SERC/ADEM recently participated in a three-day hazardous materials first responder training course conducted by the University of California (Davis) for first responders in the border area.

Topics covered included safety during hazmat incidents, instruction in the use of the DOT Emergency Response Guidebook, identification of hazardous materials, field decontamination, agency coordination, and contingency planning.

A similar emergency response training course was held for the Sister City pairs of Nogales, Sonora/Nogales, AZ and San Luis, Rio Colorado/Yuma, AZ. All of the training courses for emergency responders on both sides of the border are conducted in both English and Spanish.

LESSONS LEARNED

Constantly Going to the Basics. Recognizing that environmental laws such as Title III can be overwhelming for industry when looked at all together, the SERC acts as a funnel, receiving information from the federal level on new requirements for industry and then consolidating this information into more digestible forms. The information is conveyed to industry throughout the state through seminars, workshops, and the Arizona LEPCs.

Keeping Linked with Other Programs. In order to be most helpful to industry, the SERC/ ADEM goes beyond its primary role of implementing Title III by staying current on other, related programs, such as RCRA and the Clean Air Act.

Members of the SERC/ADEM believe they "can't work within a box" where they understand only Title III.

The SERC/ ADEM wants to understand how the many programs that relate to emergency management overlap so that they can clarify confusing issues for industry in the state.

Developing a Partnership with Indian Nations. The SERC/ADEM views its relationship with Indian nations as a partnership, where the sovereignty of the tribes is fully recognized.

The SERC/ADEM explains the lessons they learned so that the tribes can avoid some of the pitfalls they may encounter.

The interaction between the SERC/ ADEM and the tribes is beneficial to the SERC/ ADEM as well, because the tribes can assist the SERC/ ADEM by sharing information about facilities handling hazardous chemicals on their land.

MOHAVE COUNTY, ARIZONA

LEPC Profile

Membership: 28 members including, representatives from the Mohave County Board of Supervisors; Mohave County Emergency Services; industrial facilities; medical services; city police and fire departments; Mohave County Sheriff's Office; media; Kingman Area Chamber of Commerce; Citizens Against Toxic Substances (C.A.T.S.); Bureau of Land Management-Kingman Resource Area; and private citizens (chair: Mohave County Emergency Services Director).

Population: 93,500

Facilities: 40, including a Union Carbide plant; approximately 4-5 facilities report under section 302, 60 (including 20 service stations) under section 312

Topics: LEPC Organization, Inter-jurisdictional Coordination, Exercises, Emergency Planning

Mohave County is home to some of the largest natural and man-made points-of-interest in the United States, including the Grand Canyon, the Hoover Dam, and portions of the Colorado River. Set in the northern and western portions of Arizona, Mohave County has the fifth largest area of any county in the U.S. There are three primary population centers in the county: Kingman, Lake Havasu City, and Bullhead City, each with a population of approximately 20,000, and each separated from the others by 40 miles or more. An industrial park, including light industry such as a cable company, a boat-maker, and a housewares warehouse, is located in Kingman. The industrial park also contains a Union Carbide facility. There are two major transportation routes: Highway 93, which runs Mohave County, Arizona north to south, and I-40, which run east to west through the county. There is also one major railroad through the county -- the Atchison/Topeka/Santa Fe (ATSF).

LEPC Organization. The structure of the LEPC allows for maximum county-wide participation. Three subcommittees have been established to handle emergency planning for the facilities in each of the three main cities-· Kingman, Lake Havasu City, and Bullhead City. The LEPC meets every two months on a rotating schedule among the three major cities. Because the county is extremely large, this schedule was established to increase the opportunity for interested parties to participate in meetings without having to travel extensively. A core of about half of the members attend all meetings.

In general, media representatives, although members of the LEPC, do not attend meetings regularly due to travel requirements (except for the Bullhead City representative). However, because the media has participated on the LEPC in the past, a strong relationship has developed between the media and the LEPC, and the media has been very cooperative in helping the LEPC disseminate information to the public. To date, press releases have been the LEPC's primary outreach mechanism to the community, although they are interested in improving their outreach programs.

Although relatively few facilities that handle hazardous chemicals are in Mohave County, there is a cluster of significant industrial activity at the Kingman Industrial Park, near the Kingman Airport. A Union Carbide facility produces arsine and phosphine gases, and another large facility in the industrial park manufactures ethylene oxide.

In 1998, concerned community members formed Citizens Against Toxic Substances (C.A.T.S.) as a result of the proposed opening of the Union Carbide facility. Over 8,000 signatures opposing the plant opening were collected by the C.A.T.S. organization. The public outcry over the use of hazardous substances such as ethylene oxide so close to a population center caused Union Carbide to relocate a portion of the facility - the most hazardous operations were moved to a location 14 miles outside of Kingman. As a result, Union Carbide has also become actively involved. in the LEPC - the Union Carbide plant manager is a member of the LEPC and is head of the LEPC' s Kingman district subcommittee.

Inter-Jurisdictional Coordination. Mohave County recognizes the need to coordinate with nearby communities to mitigate potential hazards and promote information and idea sharing. As part of this process, Mohave County conducted a peer exchange workshop with Clark County, Nevada in October 1991. The peer exchange program is a relatively new grant program run through the International City Managers Association (ICMA).

The process is simple: LEPCs apply to ICMA, and ICMA matches up LEPCs that will benefit from an exchange with those that feel they have valuable information or programs to share. At the Mohave-Clark workshop, the participants decided that they would take part over the next year in mutually beneficial activities such as sharing hazardous materials planning information, identifying facilities along the Clark County-Mohave County boundary that pose concerns for people in both counties, conducting a cooperative emergency response exercise, and completing mutual aid plans for emergency response.

Clark County is directly to the west of Mohave County and is home to Las Vegas and Henderson, the site of the 1988 explosion at an ammonium perchlorate rocket fuel plant. The fire departments in the two counties will be holding a joint exercise in October 1992; a peer exchange between Clark County and Mohave County is scheduled to follow the drill.

Exercises. The exercise being planned for the fall of 1992 is only one portion of Mohave County's exercise program. In fact, the Mohave County LEPC has been very active in holding exercises. In the past year there have been two field exercises, one involving a transportation incident and one a fixed facility. The fixed facility field exercise involved a simulated leak from a one ton chlorine cylinder from the City of Kingman swimming pool, planned by Kingman Fire Department and Kingman hospital. Both a school and a hospital are within the vulnerable zone of the chlorine facility. The vulnerability displayed by the exercise really "hit home" with the community and has led to tangible prevention measures. As a result of the exercise, the city plans to replace chlorine gas with dry chlorine for public swimming pools by the summer of 1992. This type of prevention is a cornerstone of the Mohave County LEPC philosophy.

Emergency Planning. While the LEPC will review and revise its emergency plans as a follow-up to its exercises and accidents, it also conducts an annual plan review. The three subcommittees each have plans specifically addressing reporting facilities. Subcommittee plans are revised when new reporting facilities enter the district.

Because the community is small, the subcommittees are able to find out about the opening of new plants that would be subject to section 302 reporting through word of mouth and local news coverage.

Mohave County is also the home to three Native American Reservations: the Kaibab Reservation, the Fort Mohave Reservation, and the Hualapai Reservation. The County Department of Emergency Services is working with Hualapai Native Americans to assist in developing a tribal emergency operations plan containing an emergency response plan for hazardous materials.

A tabletop exercise based on a transportation accident, the first to involve the tribe, was conducted on May 4, 1992, in Peach Springs. Tribal leaders, the LEPC Chair, public safety officials, and others addressed the problems associated with handling the spill and coordinating the response among different local agencies. In addition to holding their exercise, the tribe is considering establishing its own Tribal Emergency Response Commission (the equivalent of the SERC). Exercises and programs such as these will increase the tribe's awareness of emergency preparedness and, hopefully, will inspire the other tribes to do the same.

LESSONS LEARNED

A Well-Rounded LEPC Equals Compromise and Good Community Relations. Many different organizations and groups within the county have representatives on the 28-member Mohave County LEPC. This blend of individuals not only assures widespread community representation, but also provides a useful forum for the exchange of differing viewpoints. Because everyone from industry to environmental groups has a voice on the LEPC, the group works to achieve a balanced program.

Since October 1989, a representative from Citizens Against Toxic Substances (C.A.T.S.), the first local grassroots environmental organization in Mohave County, has been a participant on the LEPC. The C.A.T.S. representative joined the LEPC during the conflict over the Union Carbide plant siting, and although initially intimidated and uncomfortable working with facility representatives, the C.A.T.S. representative believes that the LEPC provides a useful forum for the exchange of ideas.

The Mohave County LEPC has learned that there is a "human factor" involved in emergency planning and wants the community to know that the LEPC is more than just technicians and government employees. It is important that everyone has an equal voice and that the LEPC is a good way for different facets of the community to express their concerns. The diversity of the planning committee forces individuals with disparate viewpoints to overcome their differences and address safety problems that pose risks to the community.

Another important focus of the Mohave County LEPC is learning from past experiences and developing future programs to best suit the needs of the community. The group believes in "immediate corrective action" and when they see problems, they attempt to address them quickly and determine a safer and more effective course of action. For example, when a safety device on a nitrogen storage vessel malfunctioned, the sheriff's office immediately came in to help.

Because only the fire department has SCBA (self-contained breathing apparatus) equipment, it was important for the sheriff's office to be aware that although they wanted to assist in the response, their services were more useful in securing the area and providing crowd control. This problem was addressed though the LEPC, and when an alarm sounded a short time later, the response process worked smoothly.

"Most fundamentally, the two sides learned how to talk to one another in Kingman, and that is no small doing." Chemical & Engineering News, January 7, 1991.

EPA 550-K-93-002, September, 1993, Series 6, No. 10

SUCCESSFUL PRACTICES IN TITLE III IMPLEMENTATION: Chemical Emergency Preparedness and Prevention Technical Assistance Bulletin

HOME

State of Florida; District 5 LEPC, Florida; Monroe County, Michigan; State of Alaska; Subject Index of Series

ABOUT THIS BULLETIN

This is another in a series of bulletins that EPA is issuing to provide examples of implementation programs and strategies of the Emergency Planning and Community Right-to-Know Act of 1986, known as Title III, that are innovative or have proven effective. The purpose of these bulletins is to share information on successful practices with Local Emergency Planning Committees (LEPCs), State Emergency Response Commissions (SERCs), fire departments, and other Title III implementing agencies throughout the country in the hope that such information will prove useful to other SERCs and LEPCs as their programs develop and evolve.

Elements from the programs featured here may be transferable to other programs in similar communities or with similar situations. The bulletins provide information on a variety of practices - for example, planning, compliance, information management, hazards analysis, and outreach. The particular topics covered in each LEPC or SERC profile are listed in the box at the bottom of the first page of the profile for easy reference, along with descriptions of the planning district or state and LEPC or SERC membership.

The descriptions of the innovative and effective implementation programs and strategies are not exhaustive. They are meant to provide readers with enough information to determine if a particular approach is applicable to their own situation. For your convenience, a subject index covering the contents of the ten Successful Practices bulletins has been included in this bulletin. The index is designed to allow the reader to identify successful Title III implementation practices by topic area, and then locate the Successful Practices bulletin in which the practice was profiled.

State of Florida

A pre-existing state Hazardous Materials Task Force, consisting of representatives from various state agencies with emergency response duties, served as the foundation for the establishment of the Florida Emergency Response Commission. In 1988, the SARA Title III program in Florida was enhanced by the passage of Senate Bill (S.B.) 954, the Florida Hazardous Materials Emergency Response and Community Right-to-Know Act. The law requires the Florida Department of Community Affairs (DCA) to provide administrative support to the Florida SERC. DCA' s Division of Emergency Management (DEM) serves as the lead agency for chemical emergency preparedness and the implementation of SARA Title III in Florida.

Compliance

Under the provisions of S.B. 954, DCA was required to establish a verification program to assess compliance with the Florida reporting requirements. The first step in this task was a cross-referencing check made with existing state databases (e.g., those of the Department of Revenue, Chamber of Commerce, Department of Citrus, Public Service Commission, and Health and Rehabilitative Services). DCA also used the list of Title III section 313 submissions, the fire mars hall's liquid petroleum gas database, the Florida Department of Agriculture/Food and Drug Administration's list of ammonia freezers, and the underground storage tank database to identify facilities. Potential non-compliers are sent a certified letter at addresses identified through the Florida Secretary of State's corporate database. Under the law, the targeted facility is given thirty days to report before late fees are assessed.

SERC Profile

Membership: 19 members, including representatives from the Departments of Community Affairs, Environmental Regulation, Natural Resources, Transportation, Labor, and Law Enforcement; State Fire Marshal; Fire Chief's Association; Governor's Office; Regional Planning Council Association; Emergency Preparedness Association; Association of Counties; League of Cities; Florida Power Corporation; Legal Environmental Assistance Foundation; and labor and trade associations (chair: secretary of the Department of Community Affairs).

Organization: 11 LEPCs organized according to the pre-existing regional planning districts, each of which consists of three to eleven of the 67 counties in the state.

Topics: Compliance, Outreach, Funding

Over the last two years, nearly 3,000 initial notices of violations and over 650 follow-up notices have been mailed to companies statewide.

During 1989 and 1990, the SERC conducted demonstration compliance projects in the cities of Tampa, Jacksonville, and Miami. Fire department personnel in Tampa and local environmental inspectors in Jacksonville and Miami conducted a door-to-door survey of facilities. As a result of this project, the SERC developed a better sense of the number of potentially covered facilities. Many sites suspected of being subject to reporting did not actually qualify because they did not exceed the reporting thresholds. In addition, the SERC collaborated with EPA Region 4 in the final phase of an outreach project in Manatee County that was initiated in 1989.

After two formal mail-outs, approximately 25 facilities, suspected of being out of compliance, were visited to determine formally whether they were subject to Title III. In combination with an extensive media outreach effort, the entire project substantially increased the number of reporting facilities.

Beyond the compliance program, S.B. 954 also authorizes the state to enforce and collect fines for failure to comply with the federally enforceable provisions of Title III. As of mid-1992, the SERC had issued 31 Notices of Violation regarding the provisions of section 304 of Title III. Settlement agreements with monetary penalties of over $140,000 have been entered into for sixteen of the enforcement actions. In addition to monetary penalties, the SERC has required facilities to perform training, attend LEPC meetings, and prepare compliance articles for trade publications.

Outreach

To assist Florida facilities in complying with the requirements of the state and federal emergency planning and community right-to-know regulations, the SERC prepares a handbook on an annual basis. The 1991 handbook consists of a thorough section-by-section overview of the regulatory requirements, two consolidated Title III chemical lists (arranged both alphabetically and by Chemical Abstract Service number), and the Florida reporting forms and instructions for sections 302, 304, and 311-312 of Title III.

Florida requires the submission of a state Tier II form, which includes reporting of actual numbers, rather than ranges, for the average and maximum daily amounts of the hazardous chemical on site.

The SERC has been involved in three outreach efforts aimed at specific industries - government contractors (federal government-owned, but contractor-operated facilities are covered under Title III), agriculture, and compressed gas manufacturers and distributors -- to improve both awareness and compliance. Because the definition of facility under Title III specifically does not include federal facilities, the SERC worked in 1988 and 1989 to increase awareness among government contractors operating federal facilities of their reporting obligations under SARA Title III. The program was initiated by a DCA presentation at Cape Canaveral for the National Aeronautics and Space Administration (NASA) and its contractors. Representing both NASA facilities as well as other contractor-operated government facilities in the state, the contractor attendees are now in compliance with the requirements of Title III, and, if covered under section 302, have been the subject of a hazards analysis conducted in developing their regional LEPC's plan.

Inspired by a document developed by the Kansas SERC, the Florida SERC developed and distributed through state agricultural trade organizations a list to cross-reference Title III section 302 extremely hazardous substances with the trade names of common agricultural chemical products. The SERC also assisted the Compressed Gas Association in the preparation of detailed written guidance on compliance with Title III. The guidance was mailed in May 1990; the state then sent a follow-up letter to 65 suppliers to solicit cooperation in identifying potentially subject facilities. The information provided resulted in the compilation of a list of 2,500 facilities, of which 1,000 were previously unknown. As a result, many suppliers subsequently provided facilities with an information package on Title III requirements.

The SERC also publishes HAZ MATTERS, a quarterly newsletter describing the activities of the state's 11 LEPCs. Distributed in advance of the quarterly SERC meetings, the articles are prepared by the LEPCs and serve as a basis for discussion at a meeting of LEPC chairs and SERC staff on the day before the official SERC meeting. Outstanding issues can then be raised at the SERC meeting the following day.

The SERC, in conjunction with the 11 LEPCs, established January 26 - February 1, 1992, as Emergency Planning and Community Right-to-Know Week. Interviews with emergency planning officials were held for local television and radio stations, daily articles were prepared for local newspapers, and facility compliance seminars were conducted throughout the state. The effort was designed to enhance awareness of and increase compliance with the March 1 annual reporting deadline. The SERC also provides news articles for local papers in February and June to advertise the Title III sections 312 and 313 reporting deadlines.

Funding

S. B. 954 also established the initial Florida fee system for Title III submissions. The state charges a one-time fee of $50 for filing under section 302. In addition, there is an annual registration fee for companies reporting under both sections 302 and 312 ranging from $25 to $2,000; the amount of the fee depends on the total number of persons employed by the company's owner or operator within the state.

Those facilities only required to report under section 312 pay a reduced registration fee ranging from $25 to $500. Government entities are exempt from paying the annual registration fee. The law also authorizes a late fee of up to $2,000 if a facility has not filed within 30 days of an initial notice and up to $4,000 after 150 days. Under the provisions of House Bill 2337, which became effective October 1, 1992, DCA is also authorized to assess facilities an annual reporting fee of up to $150 for each report filed under section 313; implementing regulations for this law have not yet been issued.

The 1988 law also created a Hazardous Materials Administration Trust Fund to support DCA activities. The trust fund receives all fees and penalties collected under the fee system; the money is used to support the implementation of Title III by the SERC and the LEPCs in amounts authorized annually by the state legislature. The trust fund pays the DCA staff who support the SERC, covers all SERC supplies and other expenses, and provides grants to the counties for emergency planning purposes. The SERC used trust fund money to install the Hazardous Materials Management Information System, a database system that manages all of the information reported under Title III (sections 302, 304, 311-312, and 313) for 12,000 state facilities. The SERC receives no money out of general state revenues.

The 11 Florida LEPCs were designated along the lines of the pre-existing Regional Planning Councils (RPCs), which are responsible for addressing land use policy and coordinating inter-governmental emergency planning. The SERC has a formal, performance-based agreement to provide funding to the LEPCs.

The LEPCs receive money from the trust fund if they meet specific criteria according to a predetermined scope of work. These criteria include holding regular LEPC meetings, preparing an integrated LEPC hazardous materials contingency plan from the individual county plans, and conducting facility compliance and Title III training seminars. Over the last two years, nearly $75,000 was provided to .each LEPC to fund a full-time staff position.

Pollution Prevention Through Toxics Use Reduction

The Department of Environmental Regulation (DER) sponsors a voluntary, cooperative, non-regulatory waste reduction program known as the Waste Reduction Assistance Program (WRAP). Retired engineers are sent out at the request of the facility to provide expertise in reducing the use of hazardous substances, the generation of hazardous wastes, and releases of air toxics.

The program covers facilities handling chemicals reportable under section 313 of Title III, and focus on individual process units or even an entire facility. Although the initial focus of the visit is on housekeeping issues, inventory management, and preventive maintenance, potential process modifications are also examined. Upon completion of the facility visit, the engineer(s) provides the facility with a list of suggestions to reduce waste generation and save related expenses. Typical suggestions include material substitution, such as replacing 1,1,1-trichloroethane with less hazardous materials or non-toxic cleaners, or recycling used water in electroplating operations.

Over the past four years, more than 184 facilities have participated in the program, including Department of Defense facilities (e.g., U.S. Air Force bases) and chemical manufacturers, as well as small facilities. More than $3.7 million in savings have been achieved by Florida businesses and government facilities as a result of these source reduction efforts. To support the program, the SERC has coordinated with DER to mail letters to the chief executive officers of facilities reporting under section 313 to inform them of the program, and staff have made presentations on the program to various audiences. The SERC and local and state environmental regulatory staff refer businesses to the WRAP if they identify businesses interested in doing the right ihing to protect the community. Many businesses volunteer for free pollution prevention technical assistance, thereby saving dollars while protecting environmental quality in Florida.

LESSONS LEARNED

Prevention is Born Out of Preparedness. One of the key developments over the first few years of the Title III program in Florida has been the positive impact of the reporting and fee system burden on facilities.

In addition to the successes of WRAP, the burden imposed by these regulations has helped convince a number of facilities to modify their use of hazardous substances, and thereby reduce the risk to the community posed by an accidental release.

Such modifications have included reducing the quantity of a hazardous substance onsite to fall below the section 302 or 311-312 reporting thresholds and substituting less dangerous chemicals in on-going processes.

Title III Efforts Serve as Foundation. Initially, the SERC believed that outreach and compliance efforts would be simplified by the use of pre-existing lists of subject facilities prepared under other government programs.

When the required compliance verification program was initiated, however, it became apparent that the SERC would need to compile its own facility listing; various exemptions, threshold requirements, and other issues rendered existing lists only partially useful.

Now that the compliance verification program has established a separate Title III list, other agencies have asked the SERC to use this list to identify potentially subject facilities under their own programs.

For example, the Florida Department of Environmental Regulation was interested in data on facilities with significant tank storage volumes.

District 5 LEPC, Florida

The District 5 LEPC is composed of five counties on or near the coast of the Gulf of Mexico in central Florida: Levy, Citrus, Marion, Sumter, and Hernando. The already existing Withlacoochee Regional Planning Council was used to provide the necessary staff support for the District 5 LEPC.

Several standing committees address the principal responsibilities of the LEPC: the Regional Hazardous Materials Response Committee, the Hospital Preparedness Committee, the Public Relations and Education Committee, the Plan Review Committee, and the Plan Exercise Committee. Through mutual-aid agreements, the five counties have successfully combined their resources to prepare for and respond to hazardous materials release incidents, as well as to promote awareness of EPCRA, also known as Title III).

LEPC Profile

Membership: 25 members and 13 alternates, including representatives from local law enforcement, emergency management, fire departments, medical centers, the Department of Environmental Regulation, the news media, a community college, industry, and interested citizens.

Population: 447,000

Facilities: 175 facilities reporting under section 302, and 399 facilities reporting under sections 311-312, including waste water treatment plants, potable water utilities, phosphate mines, gasoline storage tanks, and an explosives manufacturer.

Topics: Outreach, Compliance, Funding, Emergency Response, Planning, Exercises

Outreach

The LEPC works closely with the state to encourage compliance with Title III reporting requirements. The Public Relations and Education Committee communicates to industry and the public the importance of reporting under Title III, helps facilities report properly, and informs the public that emergency planning is being done. The committee has produced a slide and video presentation about Title III and has also procured a television public service announcement from another district to help meet these objectives.

In addition, as part of an educational program, the committee is producing a brochure for school children regarding hazardous materials. The most visible effort to increase familiarity with Title III reporting requirements thus far has been the state-sponsored EPCRA Awareness Week: January 26-February 1, 1992. The District 5 LEPC publicized its own plans for the week to alert the regulated community to related activities. Jeanne Schmotzer, principal planner and staff for the LEPC, went on a radio talk show to discuss the importance of Title III and the events planned for the officially designated week. Newspaper articles also gave the event visibility. Schmotzer felt that participation from EPA and the state Division of Community Affairs enhanced the credibility of the LEPC.

The LEPC conducted "How to Comply" seminars, a Computer-Aided Management of Emergency Operations (CAMEO) presentation, and a Title III slide presentation.

They also produced a video on reporting requirements and related issues for distribution to the Chamber of Commerce and other organizations. These activities were held in conjunction with the regularly scheduled LEPC meeting, and were well attended by representatives from local facilities and several concerned citizens. The effort was such a success that the LEPC plans to repeat it next year.

Compliance

The State of Florida has taken a pro-active approach toward increasing compliance with Title III reporting requirements. The Department of Community Affairs revised section 312 Tier II forms to include actual amounts of hazardous chemicals rather than less specific ranges of pounds requested by the federal forms. They then took the initiative to mass mail the new forms to affected facilities. To assist the facilities, the state also sends them a reporting package. The package includes a compliance handbook and a map of the state indicating their district with the LEPC staff contact's name and address.

As a direct result of its own outreach efforts combined with the state's efforts, the District 5 LEPC has been deluged with requests for technical assistance. The LEPC is readily providing this assistance in completing the Tier II form.

"The state is truly dedicated to this program," explains Jeanne Schmotzer, "and the facility owners and operators know that we care about them. There's been a lot of frustration in the industry about the increased burden; the perception has been that these forms were not written with real people in mind. We have people coming in here with all of their paperwork and asking for help, so we sit down with them and guide them through the process. They're more willing to make the effort to comply if they know we're willing to help."

The LEPC staff may also assist facilities in finding ways to reduce their inventory of toxic chemicals and in substituting less hazardous substances for chemicals when possible. Many facilities have already taken the initiative to reduce toxic chemical inventories on their own. For those that have not, the LEPC suggests contacting other facilities who have an engineer on staff, or can easily contract with one, to examine their toxic chemical inventory.

Facilities can also contact their suppliers for suggestions as to which chemicals can replace the more toxic ones they use and store. A simple reduction of a stockpile, such as storing a one-year supply of a chemical rather than a multi-year supply, can decrease the hazards within a facility.

Overall, the combined efforts of the state and the LEPC to assist facilities in reducing their toxic chemical inventories have met with success.

Funding

The hazardous materials planning section of the state Division of Emergency Management collects fees from facilities for filing under section 302 and section 312, a portion of which are then divided up and parcelled out equally to the LEPCs in order to staff a position.

Last year, the District 5 Regional Planning Council received approximately $41,000 of the $450,000 LEPC fund. Individual counties may also receive grants from the state fund, based on their percentage of the state population, their number of facilities, and a fixed amount allocated to each county.

To qualify for grants from the state, the counties must produce a county hazardous materials emergency plan and provide a hazards analysis of their facilities. Last year, Hernando County received approximately $8,000, used to defray the expenses of personnel (the county planner), equipment purchases, and overhead (i.e., the cost of conducting a hazards analysis for the regulated facilities in the county, etc.).

Emergency Response

In early 1991, the counties in District 5 amended the mutual aid agreements among their fire departments to include provisions for a hazardous materials incident. To keep expenses down, the counties decided to buy equipment on a smaller scale and pool their resources through a master equipment list.

For full-scale emergencies, Citrus County has a fully equipped 20-foot response trailer, complete with computers using CAMEO software to provide a site chemical inventory, and ABTROS software to assess the hazards of certain chemicals if inadvertently mixed together.

Marion County is developing a hazardous materials emergency response team comparable to the one in Citrus County.

The LEPC has addressed the need for a common radio frequency and compatible radio equipment among the counties to improve communications in an emergency. Although no new equipment has been bought, the regional hazardous materials emergency plan lists each county's radio frequencies for easy reference.

Planning

Another interesting element of District 5's activities is its attention to potential transportation accidents involving hazardous materials.

Interstate 75 and Routes 441 and 301 serve a great number of trucks travelling north from the industrial areas in Tampa and St. Petersburg. Trucks transporting explosives, catalysts, fuel, and other hazardous materials used in manufacturing pose a danger to the community, but are not included in regional hazardous materials emergency plans.

The need for such planning was demonstrated in the summer of 1988, when a truck carrying 8,000 gallons of auto transmission fluid drove off of Interstate 75 into a ravine.

The accident occurred in a rural area during the early hours of the morning, the busiest time of day for truck traffic.

The emergency response team closed the highway, surrounded the truck, and allowed it to burn down. The driver of the truck, who was killed, could not be identified until the trucking company was contacted.

When the company was traced and could identify the contents of the truck, the emergency response team noted that such an accident could pose serious hazards to the community in slightly different circumstances.

If the truck had been carrying a more toxic chemical with explosive properties or a gaseous chemical that could spread beyond the interstate, or, if the accident had occurred in a more populous area, local residents, livestock, and food crops could have been injured or destroyed. Railroads are another transportation concern to District 5 emergency planners.

In February 1992, two rail cars containing 179,000 pounds of chlorine derailed from the train tracks running through a residential area in Ocala, a large city in Marion County.

Railroads do not have to notify the authorities of a derailment unless there is a leak, so neither the city nor the county knew about the accident until a neighbor reported it several hours after it occurred.

The LEPC pointed out that even in the absence of a leak, a derailed railroad car carrying a hazardous substance poses risks to those attempting to get it back on the tracks.

Since this incident, government and railroad officials have agreed to work with local fire departments to provide more information to the counties about their operations, in order to better prepare for a more serious incident in the future.

As a result of these and other incidents, Hernando County has included a transportation section in its hazardous materials emergency plan, the first county in the state to do so.

The LEPC intends to expand this approach to include the other counties in District 5. The LEPC has also made recommendations to local governments to change accident reporting regulations, so as to include incidents such as the one described above. In addition, the LEPC has submitted the name of a Florida Department of Transportation representative to the SERC for membership in the LEPC.

Exercises

On September 21, 1991, the District 5 LEPC conducted one of Florida's first, and certainly most ambitious, multijurisdictional field exercises for a toxic chemical release incident in the city of Dunnellon in Marion County.

The LEPC's Plan Exercise Committee led an effort that culminated in a full-scale exercise involving more than 140 people from 27 organizations and all five counties. The scenario involved an urban area in which a tanker truck carrying sulfuric acid collided with a train. Diesel fuel was spilled as a result of the collision.

Possible hazards included the diesel fuel mixing with sulfuric acid, corrosion of metals causing a large release and chemical reaction with surrounding materials, a release to the Withlacoochee River through storm drains with a build-up of hydrogen gas, and an explosion in storm drains with damage to water mains.

In its review of the exercise, the LEPC identified several areas for improvement, most notably the need for increased training for first responders, some of whom are volunteer fire fighters, and the need for better communication among the counties.

The exercise also exposed deficiencies in the understanding of the Incident Command System.

Each participating agency will review its standard operating procedures, which they believe fell short.

LESSONS LEARNED

More Assistance Leads to More Compliance. Probably the most practical element of the LEPC's SARA Title III implementation efforts has been the technical assistance to facilities attempting to comply with reporting regulations. By meeting facilities half way in their efforts, the LEPC has seen compliance increase dramatically. A strong commitment from the state level has contributed notably to the LEPC's successful outreach activities.

Cooperation Is the Key to a Successful LEPC. Cooperation among the counties within the LEPC and with other LEPCs has also been vital to the success of the Title III program. New ideas such as the hospital preparedness survey are disseminated widely, adapted freely, and implemented at both the state and local level. Resources and outreach materials are also shared. Thus, the regulatory community has presented a coherent program to industry and to the public.

Working with the Medical Community

Local hospitals are one segment of the community that have already benefited from the LEPC's increased outreach efforts. The LEPC heard about another district's success in surveying area hospitals' chemical emergency preparedness and promptly adopted the idea. A committee was formed to assess each hospital's level of preparedness for treating victims of a toxic chemical release. The committee examined every phase of treatment, including ambulance services.

Unfortunately, the resulting report concluded that the hospitals in the region were not well prepared for such an incident. In response to these findings, the LEPC developed a list of recommended practices and resources necessary for the hospitals to treat chemical accident victims.

As a follow up to that effort, the LEPC visited area hospitals to assess what resources the hospitals actually had. During these visits, the LEPC emphasized that hospitals could upgrade their facilities to address deficiencies in existing capabilities without making huge expenditures.

Recently, an emergency room doctor at a major hospital in Hernando County donated her time to assist the LEPC and the other area hospitals in developing procedures for treating potential medical emergencies associated with a chemical accident. The Munroe Regional Medical Center in Marion County was undergoing major renovations, and at the suggestion of the LEPC, took the opportunity to install a special hazardous materials decontamination room.

Monroe County, Michigan

Monroe County is situated in the southeastern corner of Michigan, bordering Ohio to the south and Lake Erie to the east. The county's 556 square miles are primarily composed of farmland and small towns.

Monroe County has set the standard in Michigan and the nation for incorporating the farming community into the larger web of the emergency response community. Although the Emergency Planning and Community Right to Know Act of 1986 (EPCRA, or commonly known as Title III) Monroe County, Michigan did not specifically target farms, Monroe County contains a large number of farms that must comply with the emergency planning requirements in section 302 of Title III. As a result, a model program was developed and implemented for the county that incorporates the specific needs of the farming community. The program, recently approved by Michigan's SERC, will ensure that farmers with extremely hazardous substances in quantities subject to the section 302 reporting requirements will be able to comply with Title III regulations in an easy, yet comprehensive manner.

LEPC Profile

Membership: 16 members, including representatives from state and local government, law enforcement, emergency management, fire services, first aid, public health, environmental health, hospital services, transportation, media, community groups, facility owners/operators, education, agriculture, and organized labor. The Monroe County LEPC is divided into 5 subcommittees: Budget, Right-to-Know/Notification, Planning, Training, and Resources.

Population: 134,000

Facilities: Approximately 1,400 farms as well as a coal-fired power station, a wastewater treatment plant, a water treatment plant, paper companies, and several small manufacturing companies.

Topics: Outreach, Planning, Funding

Outreach

One of the distinctive characteristics of Title III is that emergency response plans must address the specific characteristics of each community. Monroe County is distinguished by the number of farms subject to Title III in comparison with other types of facilities using hazardous substances. Modem farming techniques pose a potential threat to the community because they involve the controlled use of a variety of chemicals on EPA' s list of extremely hazardous substances (EHSs), particularly anhydrous ammonia. In some communities, the risks associated with farming are generally ignored because of the seemingly bigger dangers presented by industrial facilities.

Until recently, this phenomenon was true in Monroe County as well. However, the use of EHSs, coupled with the rapidly increasing number of housing subdivisions built in the county's rural areas, has created a large potential for accidents. Further, the storage of hazardous chemicals on farms poses an even greater risk when sensitive populations, such as day care centers and nursing homes, are located in close proximity to the farms. As a result, an urgent need arose for an emergency planning program with a special emphasis on farms.

The initial attempt by the LEPC to communicate the Title III reporting requirements to farmers was a failure. A vague, one-page questionnaire was poorly distributed by the area's agribusinesses and, because it was distributed during the harvest season, was poorly received. The response was limited, and the questionnaires that were received lacked the information the LEPC needed for planning purposes.

After this initial attempt, a Geography and Planning Masters Degree candidate at the University of Toledo decided to focus on the issue as the subject of a thesis project. A team of representatives comprised of university, state, and local representatives was formed to develop a completely new approach to the problem of outreach to the county's farmers. Among this team of representatives was a hazmat planning specialist from the Emergency Management Division of the Michigan State Police, the pesticide education coordinator of the Michigan State University Cooperative Extension Service, a member of the Michigan Department of Agriculture, a member of the Legislative Council for the Michigan Farm Bureau, the Agriculture Extension Agent in Monroe County, the fire chief of the Bedford Township Station 1, and two professors in the University of Toledo Geography and Planning Department. In addition, several members of the team also served on the Michigan State Emergency Planning Committee (SERC).

The philosophy behind setting up a new program was simplicity: the less the farmers had to do in order to comply, the more effective the program would be. If a farmer could provide the essential, site-specific details of the farm, then the LEPC could prepare comprehensive response plans. The goal of the team was also to create a program that could be used by any planning district in the nation with a significant farm population. "Together," explains Cyril Keiffer, Masters Degree candidate and team leader, "this eclectic group set its sights on a universal goal - to develop a plan to help not only Monroe County, but also any county across the country."

The result was a standardized emergency planning questionnaire that overcame one of the largest obstacles to reporting compliance and effective planning. Previously, each farmer started from scratch in providing the LEPC with the information needed for the emergency response plan. Now, with the introduction of the standardized questionnaire, published by the Michigan State University Cooperative Extension Service, farmers can comply with the reporting requirements and provide emergency response planning information in one step.

Under the new system, questionnaires, including a brief explanation of Title III and the farmer's responsibilities under this statute, are distributed to the farming operations. The questionnaire also includes a partial list of EHSs specific to Michigan farms and requests site-specific information necessary for the development of site-specific plans. These plans are unique because they also incorporate the requirements of the Michigan Firefighters Right-To-Know Act, which requires that the fire chief of each fire district develop an emergency plan for all places that store or use certain chemicals.

The list of chemicals in the Firefighters Right-To-Know Act is broader than the EHS list; it includes any hazardous chemicals used or produced regardless of quantity. Another unique aspect of Monroe County is the extent to which the farmers are getting involved and complying with the regulations. Initially, farmers wanted to comply, but complicated regulations and the absence of any outreach made this difficult. With the introduction of the standardized questionnaire, compliance became easy.

To date, the packet has been sent to 1,400 farmers in the county and hundreds have already been returned. Some farmers have even voluntarily shown up at the LEPC office to fill out the forms. The LEPC expects virtually all the farms in the county to be subject to reporting requirements because of the low threshold planning quantity of anhydrous ammonia, a substance used by most farmers. In addition, farmers seem to be taking the advice of the LEPC and using a three-ring notebook to keep an updated list of the chemicals used and stored on the premises, the MSDSs for those chemicals, and the response plan for their farm.

One reason for the success of this program is that local and state groups bridged the gap between the farmers and the LEPC. In part, this effort consisted of changing the tone of the reporting requirements from threats of enforcement to positive outreach describing how the requirements could ultimately help to save the lives of the farmer's family and friends. By focusing on the risks involving the use of hazardous chemicals and the importance of planning, the perception of Title III was transformed from annoying paperwork to a beneficial program that identifies chemical hazards and prepares for potential emergencies involving these hazards.

The Farm Bureau, a trusted agribusiness organization, and the Michigan State University Cooperative Extension Service promoted the goals of the team of representatives by providing the necessary outreach to the farmers. The Michigan State University Cooperative Extension Service provided several different publications to farmers explaining the requirements of Title III. The Farm Bureau helped provide the networking system needed to reach all the farmers by including a questionnaire in their newsletter sent to 45,000 farms in Michigan. In addition, the Farm Bureau Network broadcast several statewide radio programs focusing on Title III. Cyril Keiffer said that the effort with the Farm Bureau "portrays that it is important to approach Title III from the positive for its ultimate goal is to save lives."

Planning

The identification of chemical hazards and the planning for these hazards are two of the major goals of Title III. The standardized questionnaire helps to meet both of these goals by requiring farms to notify the LEPC if EHSs are present at or above threshold planning quantity and by providing the LEPC with the necessary information for the planning process. Therefore, the responsibility for emergency preparedness is shared by both the farmer and the LEPC. As a result, it is essential that the farmer, the local fire department, the local agricultural agent, and the members of the LEPC cooperate in order to guarantee the implementation of a plan that addresses all possible emergency scenarios.

Because the team's intention was to make Title III requirements "farmer-friendly," all of the material in the new questionnaire is written with the farmer in mind. For example, the EHS list in the brochure focuses on those chemicals relevant to a farmer; herbicides, pesticides, and fertilizers comprise the majority of the list. A glossary of the chemicals was taken from the CAMEO computer program, and presented to the farmers with the facts about their chemicals along with alternatives to the EHS substances they are currently using.

Another feature of the questionnaire is that the chemical checklist is subdivided so that the plan indicates seasonal usage and storage so that emergency responders know what to expect during an incident at a specific site and during a specific season. This feature is particularly useful because Monroe County's LEPC will be able to determine the differences in preparedness requirements from one season to the next. Further, the questionnaire asks for information relevant in assessing the hazards of each farm including the nearest crossroads, private wells that may be on the farm, and the proximity to sensitive populations. The questionnaire closes with a sketch of the layout of the farm that must include all buildings, wells, storage tanks (above and below ground), and storage areas of chemicals.

By submitting the questionnaire, farmers have met their obligation to notify the LEPC as well as contributed significantly to the LEPC’s task of developing an effective emergency response plan. In the future, information will be entered into the enhanced-9-1-1 computer system, so that if a call comes in on a farm that has a plan completed, EHS and other pertinent information will be displayed.

Once all the questionnaires are received from the farmers, emergency response plans will be developed for each fire district within the county. As of this point, a model plan has been written for the Temperance Fire Response District. After the completion of this model plan and its adaptation by the SERC, the Michigan State Police Emergency Management Division mailed a packet containing the questionnaire, the model plan, the glossary of chemicals, and an explanation of the process to all LEPCs in the state. This effort was part of the outreach to LEPCs by the State of Michigan to provide guidance in both gathering information and preparing contingency plans.

The emergency response plan for each district is divided into two sections. The first part is a generic description of the fire department and its capabilities, resources, and responsibilities. The second part consists of site-specific plans that are custom-designed for each farm reporting under section 302 within the district. The vulnerable zone calculations for site-specific plans were calculated using CAMEO based on the data regarding chemical quantities and storage patterns supplied by the farmers. After the response plan has been completed, each section 302 farm receives a copy of the Response Information Data Sheet (RIDS) for each chemical on the farm, the Farm Hazard Description/Population Vulnerability report that applies to their farm site, and emergency notification procedures for the farm.

If a spill occurs, the response will be a joint, cooperative effort between the farmer, agribusiness, and local government, and, if appropriate, state and federal agencies. The Facility Emergency Coordinator for each site is responsible for initially assessing the magnitude of the incident and notifying the Monroe County dispatch. The fire department will then be responsible for reviewing the farmer's assessment and evaluating the initial classification. If help is needed, the fire department will notify the Monroe County Health Department's Environmental Health Division, and, if necessary, the Toledo Hazmat Team across the border in Ohio.

Funding

Much of the work planning and developing the Monroe County emergency response plan was accomplished because of the commitment and dedication of a group of individuals who did much of the work on their own time. The LEPC has, however, received funding from county funds through the county commissioners in the form of staff and supplies and from Emergency Management Allocations (EMA) from the state. In addition, the Michigan Farm Bureau, the Michigan State Police Emergency Management Division, and the Monroe County. Emergency Management Division paid for the mailings to the farmers.

There is also a bill currently in the Michigan Legislature that should provide money from general funds. In addition, Cyril Keiffer suggested that other LEPCs, attempting to initiate a similar plan, could offer students in health or environmental departments in universities the opportunity for paid or unpaid internships with the LEPC.

LESSONS LEARNED

Reducing Reporting Burden Helps Increase Compliance. The new model is successful in part because Monroe County's plan incorporates the requirements of Title III with the Michigan Firefighters Right-to-Know Act. This Act requires that the fire chief of each fire district develop an emergency plan for all locations that store or use hazardous chemicals, regardless of quantity. Because the Firefighters Right-to-Know Act and Title III regulations request similar information from the farmers, such as the description of the types and locations of hazardous chemicals stored on site, Monroe County combined the programs so that the information in the standardized questionnaire satisfies both requirements. In addition, many volunteer firemen in the area are farmers in Monroe County, so they immediately saw the value in complying with both regulations by returning the site-specific information.

Money Isn't Everything. Lacking sufficient funding, the team of representatives sacrificed their personal time to develop a system that makes compliance for the farmers simpler and the writing of comprehensive response plans easier for the LEPC. The success of this program is due in part to the dedication of those individuals who approached the problem of compliance within the farming community from a different angle. According to Cyril Keiffer, "this program just goes to show the things that can be accomplished without a lot of money."

"Yes, It's Legislation, But Here's The Good Side..." One of the true lessons learned from the Monroe County is the role that education plays in implementing a successful program. At first, the farmers approached Title III with the attitude that this regulation was just another way for the government to control farmers and threaten them with fines. But, once the farmers of Monroe County were educated on the importance of Title III, their attitude changed and so did their willingness to comply with the regulations.

When it was explained to them that Title III was intended to protect their families, friends, and neighbors, and when the process of compliance was made simpler, their attitude towards Title III changed. As of this point, the new system developed in Monroe County has been fully tested and the LEPC is continuing the outreach program started by the team of representatives and are awaiting the return of some of the questionnaires from farmers. So far, the program appears to be a success. The farmers have been very receptive to the standardized and simplified questionnaire.

Diversity Works. One premise of the LEPC is to bring together a diverse group of individuals -- local and state, private and public -- so that issues can be approached from a variety of different angles. Unfortunately, many times this creates problems because diversity can lead to conflicts of interest. However, despite many different interests, the team of representatives was able to develop a plan that made compliance fast, easy, and effective. As Cyril Keiffer says, Monroe County and Michigan provides proof for the benefits of diversity: "If you get the right people and involve them in the right way, it can be very successful."

State of Alaska

Alaska, America's "last frontier," as the state motto proclaims, is best known for its natural beauty and its oil industry. Less well known is the fact that hazardous substances are used in nearly every community in the state. Typical facilities include: crude oil tank production, pipeline, storage, and tanker operations; petroleum refineries; bulk fuel storage; fish processing plants; and pulp mills. Common hazardous substances used by these and other industries and transported through communities include: chlorine, used by fish processors, pulp mills, water and sewage treatment plants and swimming pool complexes; methanol, hydrochloric and hydrofluoric acid, used at oil fields on the North Slope and Cook Inlet; and of course diesel fuel and other petroleum products. An atypical facility, and a significant concern in the state, is a major fertilizer manufacturer on the Kenai Peninsula. Alaska is different from most states in its internal political districts. Instead of counties, the sub-state political jurisdictions are boroughs. There are 16 boroughs that encompass only 30 percent of the state land area, but encompass 80 percent of the state population including the largest cities, Anchorage (population 220,000), Fairbanks (29,000), and the capital, Juneau (26,000). The remainder of the state is in one huge unorganized borough. While 27 Emergency Planning Districts (EPDs) have been created by the state as planning areas, only 14 of those areas have LEPCs appointed by the SERC. The remaining 13 EPDs are in remote and rural areas that often have no road network, with populations less than 500 in each EPD, and few chemical hazards. In these areas, there is not only a lack of the diversity of people to fill the required occupational categories to form an LEPC, but with so few hazards, there is an understandable lack of local motivation to form an LEPC. However, the SERC is considering alternative mechanisms and forums to address response issues in these areas. One potential solution is to use the planning areas of the Oil Pollution Act of 1990 to address any hazmat concerns in these rural districts. To date, all EPDs and the 14 LEPCs generally follow the jurisdictional boundaries of boroughs.

SERC Profile

Membership: includes 16 representatives from the state Departments of Environmental Conservation, Community and Regional Affairs, Public Safety, Military and Veteran Affairs, Health and Social Services, and Transportation; local government; industry; state Fire Chiefs Association; Native Americans; and public interest groups

Organization: 14 LEPCs established in 27 Local Emergency Planning Districts

Topics: SERC Organization, Hazards Analysis, Planning

SERC Organization

Formed in 1987, the SERC, which meets quarterly, is composed of 16 members: 9 state agency commissioners or their designees and 7 public and private members. All activities of the SERC are administered by the Alaska Department of Environmental Conservation (DEC). In 1990, the state legislature passed House Bill 566, establishing the SERC in state law. The legislation provides funding for Title III implementation activities. The funds are appropriated annually by the legislature from the Oil and Hazardous Substance Release Response Fund. The fund is generated by a surcharge on oil production to support emergency response and planning. For FY 92, $900,000 was appropriated with 60 percent ($540,000) being channeled to LEPC activities. For FY 93, 80 percent, or $ 1.2 million of the state allocation, will be channeled to LEPC activities. The commissioner of the DEC serves as SERC chair and oversees five standing committees. The Work Plan Committee helps the SERC identify priority activities and monitors the state's implementation of Title III. The LEPC Liaison Committee coordinates the establishment and activities of LEPCs. The Training Committee identifies training needs for responders. The Emergency Response Committee facilitates state and LEPC planning efforts by providing guidance documents and minimum content standards. The Public Awareness & Data Utilization Committee works to raise awareness in Alaska and is coordinating the development of a statewide database for community right-to-know uses.

Hazards Analysis

One of the first objectives of the SERC has been fostering the development of LEPC comprehensive response plans. Hence, hazards analysis has been the SERC' s most recent focus, as a precursor to plan development. The SERC is coordinating LEPC-based hazards analyses by providing technical assistance to the LEPCs in designing the scope of work and evaluating contractor proposals which will be funded by the legislature's annual appropriation. In some cases, groups of adjacent LEPCs will be working together; other LEPCs will work independently. Many LEPCs have already hired contractors, others are in the selection process.

To date, Petersburg and Ketchikan are the only LEPCs that will not be using contractor assistance; in Ketchikan a borough employee will perform the analyses. To complement the activities of the LEPCs, the SERC will conduct hazard analyses in all areas of the state not included in LEPCs, which is 70 percent of the state land area and 20 percent of the state population. The state projects that all contracts for hazards analyses will be awarded by June 1993 and all hazards analyses will be completed by the end of 1994.

The analyses will follow the airborne toxics approach outlined in the Technical Guidance for Hazards Analysis published by EPA, FEMA, and DOT, but, as required in the H.B. 566, the analysis has been expanded to include facilities with flammables (crude oil and bulk fuel storage facilities) and explosives (mining operations) even though the chemicals are not covered under section 302 of Title III. In addition, the state will also be identifying those facilities with the potential for chemical and petroleum spills that could affect the drinking water supply or sensitive ecosystems. Cooperative agreements are also underway to involve federal military facilities in identifying and assessing hazards at these facilities. Once the hazards analyses have been compiled at the local level, they will be transferred into a statewide Computer Aided Management of Emergency Operations (CAMEO) system, and eventually incorporated into a Geographical Information Systems (GIS) format along with data from other state environmental programs such as RCRA and CERCLA. The CAMEO system is a computer program developed by EPA and the National Oceanographic and Atmospheric Administration, Department of Commerce that has the capability to manage hazardous substance inventories, transportation data, estimate vulnerable zones, and calculate and store risk analyses. While CAMEO is an excellent tool for hazards analysis and emergency response, GIS systems typically have expanded storage, problem solving, and display capabilities. For example, a GIS can store potentially unlimited (limited only by memory capacity) amounts of data linked to a specified geographic area.

Applications of GIS for the SERC and the Department of Environmental Conservation include planning and enforcement. For example, if a water (ground or surface) quality sampling site is revealing traces of benzene, the GIS can be queried to show facilities that are in the vicinity, upstream of the well, that use benzene. This application will provide local environmental enforcement officers with quick and clear information to pursue potentially noncompliant facilities. Public health applications include developing GIS overlays that reveal concentrations of people with respiratory problems and facilities that use chlorine gas. This computerized inventory of information will enable the State Department of Environmental Conservation to make management decisions regarding environmental issues based on more complete data. The state plans to analyze the information not only to plan for emergencies involving accidental releases, but also to evaluate long-term, chronic pollution problems and their effects on public health. In. addition, the system will provide the capability to identify and map major permitted locations, identify and map contaminated sites, identify and map major transportation routes for oil and hazardous materials, and to monitor and map data from water quality programs. The state will also use the GIS to identify, based on concentrations of chemical hazards, where to encourage the development of volunteer response teams and where to locate equipment depots.

Planning

Because the hazards analyses are not completed, as yet no LEPC plans are approved. The SERC is currently developing response guidelines that will include core elements and minimum requirements necessary for SERC approval of an LEPC plan. The SERC hopes to promote development of emergency plans by providing specific criteria to assist LEPCs as they develop their plans. The SERC met in October to discuss policies for plan review and approval. House Bill 566 goes beyond the requirements of Title III in its efforts to comprehensively identify hazards and plan an integrated response. To that end, the law broadens the definition of hazardous substances to include oil for the purposes of hazards analyses and response planning. This is a significant distinction from the federal law and could double the amount of information collected and analyses performed. Thus, the law expands the assessment of the chemical-related hazards in a community and identifies the potential areas/population to be impacted should a release occur. Further, the law and SERC policies together use several mechanisms to ensure integrated planning and procedures for response. This is achieved by requiring that the statewide all-hazards plan, addressing natural disasters and technological disasters, be coordinated with the statewide hazardous materials plan.

Also, the state plan will be coordinated with the EPA Region 10 RCP and potentially the Region 10 Supplement to the FRP-Regional Supplement, ESF #10: Hazardous Materials. Due to the geography of Region 10, Alaska's RCP and FRP Regional Supplement are separate from the rest of Region 10. This coordination will support a state/federal system of response for human-caused hazardous material/oil pollution incidents or in the event a natural disaster (earthquake or flood) creates hazardous material/oil incidents. The same is true at the local level, i.e., the LEPC hazardous materials plans will be coordinated with the borough or local government all-hazards plans. When the regional plans for oil spill contingency are developed as required under the OPA of 1990, they will be coordinated and potentially combined with the EPA Region 10 RCP and FRP-Regional Supplement. Yet another provision under the law creates the Spill Technology Review Council within the SERC to identify spill containment, dispersement, and cleanup products for use in a release in Alaska's arctic and sub-arctic climate. In 1991, the Council issued its first annual report. The report recommends research objectives for 1992 that include: utilization of skimmers and oil/water separators, the effectiveness of dispersants, in situ burning, oil recovery from ice, in situ and ex situ bioremediation of soils contaminated by hazardous materials, and reuse/recovery of hazardous wastes.

LESSONS LEARNED

Integrated Planning At All Levels Can Overcome Most Obstacles. Several events have shaped the emergence of Alaska's drive to form a statewide integrated planning process: the Exxon-Valdez incident, the creation of LEPCs, and the multitude of federal facilities in the state. These events focused the state on the need for integrated planning and shared capabilities among federal, state, regional, and local governments; LEPCs; and industry. Camille Stephens, staff with the SERC, explains Alaska's challenge: "Many industries, federal facilities, and a few local governments in Alaska have very advanced and capable response teams. Yet, the distances and difficulty in access to areas of Alaska demand that mutual aid agreements be created and jurisdictional borders and issues be overcome. Our goal is to instill the concept of working together into the various agencies and industry to build an integrated response network that benefits the entire state."

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GUIDES TO CHEMICAL RISK MANAGEMENT: Chemical Safety in Your Community: EPA's New Risk Management Program

HOME

The Current Status of the Risk Management Program Rule

As of the publication date of this backgrounder, key elements of EPA's Risk Management Program Rule are still not final. Public access to the offsite consequence analysis data continues to be debated. EPA has not officially decided on how it will respond to Freedom of Information Act requests. The agency has said that while the offsite consequence analysis data will not be distributed to the public on the Internet, it will supply paper copies of the data upon request. Also, EPA intends to increase the reportable quantity of hydrocarbon fuels (i.e., propane).

Concurrently, the U.S. Court of Appeals granted an interim stay of the Risk Management Program Rule as it applies to facilities using propane in a process. For the most current information, see http://www.epa.gov/ceppo.

For More Information

The National Safety Council is maintaining the Chemical Emergency Management Web site at www.nsc.org/xroads.htm as a resource supplement to this series of publications. The site is a directory of Risk Management Program-related links to organizations, regulations, chemicals, rules, and regulations involved in emergency management and the safe handling of chemicals. A selection of articles and papers written about the Risk Management Program Rule and local efforts to identify and analyze risk in the community is also included. The site will be constantly expanding as industry and communities develop new information required under the Risk Management Program Rule.

Other Publications in this Series

Other documents in the Guides to Environmental Risk Management Series are listed below:

- New Ways to Prevent Chemical Accidents
- How Safe Am I? Helping Communities Evaluate Chemical Risks
- What Makes a Hazard Hazardous: Working with Chemical Information
- Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequences Analysis

These documents can be downloaded for free from the Chemical Emergency Management Web site at www.nsc.org/xroads.htm.

About this Document

The Environmental Health Center produced this guide under cooperative agreement CX 826604-01-0 with the U.S. Environmental Protection Agency. It is part of a series of publications on the Risk Management Program Rule and issues related to chemical emergency management.

Chemical Safety in Your Community: EPA's New Risk Management Program

By June 21, 1999, an estimated 66,000 facilities — including chemical plants, oil refineries, propane retailers, fertilizer warehouses, ammonia users, and water treatment plants — must comply with the Risk Management Program Rule (RMP Rule). These facilities are required to identify their hazardous chemicals, analyze the potential risks of these chemicals to the surrounding community, develop an emergency response program, and submit a summary of their risk management program to the U.S. Environmental Protection Agency (EPA). EPA will then distribute this information, making public a new generation of right-to-know information about hazardous chemicals and community hazards.

Though the RMP Rule applies nationwide, the main effect will be at the local level. Using this powerful information, local authorities and communities will be able to identify chemical hazards and risks and improve public safety. Journalists reporting on the publicly available risk management information will stimulate communities to learn more about the chemical hazards in the community. Related stories can help communities evaluate the potential for exposure to risk. And public dialogue with local industries can promote facility safety, encourage accident prevention initiatives, and improve emergency response plans.

Bhopal: The Trigger

Human error, equipment failure, and natural disasters can all cause chemical accidents. The danger to the public from an unplanned release of a toxic chemical is illustrated by the 1984 Bhopal, India, tragedy. There, a release of 40 tons of highly poisonous methyl isocyanate (MIC) killed more than

2,000 people and injured 170,000, leaving thousands more to die later. Another release involving the same chemical occurred months later in Institute, West Virginia, sending more than 100 residents to the hospital.

As a result of Bhopal and similar incidents, Congress enacted a law to help inform communities of chemical hazards and aid their emergency planning. The law, known as the Emergency Planning and Community Right-to-Know Act (EPCRA), was passed as part of the 1986 amendments to the Superfund hazardous waste cleanup program.

Key Events Related to the Risk Management Program Rule	
1983	The OSHA Hazard Communication Standard (29 CFR 1910.1200) provides employees a right-to-know about the hazards of chemicals to which they are exposed.
1984	In Bhopal, India, a release of 40 tons of highly toxic methyl isocyanate kills more than 2,000 people; thousands more die later.
1985	In Institute, West Virginia, a release involving methyl isocyanate sends more than 100 people to the hospital.
1985	EPA creates its Chemical Emergency Preparedness Program and urges a voluntary program to develop plans that address potential hazardous chemical emergencies at facilities.
1986	Congress enacts EPCRA to provide the public with information about the amounts of hazardous chemicals present and discharged from fixed-site facilities. The law establishes the infrastructure of SERCs and LEPCs to develop emergency response plans for each community and fosters chemical emergency management dialogue between industry and local communities.
1990	Congress enacts the Clean Air Act Amendments. Section 112(r) includes requirements for establishing the Risk Management Program Rule to (1) prevent and prepare for accidental releases of chemicals that could cause immediate, serious harm to human health and the environment and (2) communicate hazard information to the public.
1992	The OSHA Process Safety Management Standard is released. This standard is designed to prevent or minimize the consequences of a catastrophic release of toxic, reactive, flammable, or highly explosive hazardous chemicals from a process. It serves as a model for Risk Management Program Rule requirements.
1994	EPA publishes its List of Regulated Substances and Thresholds for Accidental Release Prevention, identifying the Risk Management Program's regulated substances and threshold quantities. Amendments were published in 1996, 1997, and 1998.
1996	EPA releases the Risk Management Program Rule requirements under section 112(r) of the Clean Air Act. Facilities are given three years to comply. This rule also establishes the obligation to create an independent Chemical Safety and Hazard Investigation Board to investigate the causes of major chemical accidents and provide industry with information about conditions that compromise safety.
1999	Under Clean Air Act section 112(r), RMPs must be submitted to EPA before June 21, 1999.

Setting the Stage: The Emergency Planning and Community Right-to-Know Act

EPCRA created State Emergency Response Commissions (SERCs) and Local Emergency Planning Committees (LEPCs) to implement the act. SERCs are appointed by the governor and consist of state emergency, environmental, and health agencies; public interest associations; and others with emergency management experience. LEPCs, whose makeup is specified by the law, typically consist of —

- Representatives of elected state and local officials
- Law enforcement officials, civil defense workers, and firefighters
- First aid, health, hospital, environmental, and transportation workers
- Representatives of community groups and the news media
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, and small businesses

Participation of the news media is specified by law. In practice, however, very few journalists actually sit on an LEPC, believing that such participation represents a conflict of interest. This same infrastructure will be leveraged to implement the Risk Management Program. (See Key Events Related to the Risk Management Program Rule.)

About 868,000 facilities that have more than 400 extremely hazardous substances listed by EPCRA report information about their chemical inventories to LEPCs, SERCs, and local fire departments. Under EPCRA, facilities are required to file reports if the quantities of the hazardous chemicals exceed specified thresholds. In 1987, EPCRA launched another important right-to-know program, called the Toxics Release Inventory, that reports emissions of hazardous substances into the environment.

EPCRA's reporting requirements and emergency planning and notification provisions established a coordinated effort among EPA, state governors, SERCs and LEPCs, owners and operators of regulated facilities, and local fire departments. LEPCs receive chemical inventory information, analyze the hazards, and develop local emergency response plans. They are responsible for disseminating this information to the public and serving as a focus for community awareness and action.

EPCRA extended right-to know beyond the workplace and into the community. This information has stimulated communication between industries and communities and encouraged industries to store smaller inventories of hazardous substances, discharge less, and substitute less-hazardous chemicals. In addition, the availability of public information about hazardous chemicals has encouraged investigative reporting and community activism, often combining chemical hazard issues with related issues, such as environmental justice and children's health.

Picking Up Where EPCRA Left Off: The Risk Management Program

In 1990, Congress took additional measures to protect communities from hazardous chemicals by including accident prevention and emergency preparedness measures in the Clean Air Act Amendments of 1990 (CAA). Section 112(r) of the CAA authorizes EPA to create regulations that prevent and prepare for accidental releases. On June 20, 1996, EPA issued the RMP Rule (40 CFR 68). Its primary goal is to protect communities from releases of toxic or flammable chemicals that are prone to cause immediate, serious harm to public and environmental health.

Like EPCRA, the RMP Rule contains important right-to-know provisions. The RMP Rule requires facilities to provide EPA with a summary of their risk management programs if more than a specified threshold amount can be released by an incident involving one process. A process is defined as manufacturing, sorting, distributing, handling, or using a regulated substance. Chemicals in transit, including pipelines, are excluded.

EPA will distribute a summary of each facility's risk management program, known as a risk management plan, or RMP, to state and local agencies involved with emergency planning and response. These programs will include an accident prevention program, a hazard assessment (which includes an offsite consequence analyses), and an emergency response program. The RMPs will provide state and local agencies with additional information about chemicals and facilities regulated by EPCRA. Since the RMP Rule regulates some chemicals not regulated by EPCRA, state and local agencies will have access to information about additional chemicals

The general public will be given ready access to some—but not all—RMP information through the Internet and other means, including SERCs and LEPCs. Information made available to communities enables them to learn more about local chemical hazards and the extent to which risk of exposure to these hazards is reduced through a facility's risk management program.

Summary of Key RMP Requirements

- Develop and implement a risk management program, consisting of the following:
  - Hazard assessment program
    - identity of listed substances and quantities stored on site
    - five-year history of accidental releases
    - worst-case release scenario analysis with effect on the community
    - alternative release scenario analysis (only by some facilities)
  - Accidental release prevention program
  - Emergency response program
- Submit written RMP to EPA before June 21, 1999
- Revise RMP at least every 5 years

Reducing Risk: Accident Prevention as the Key

The accident prevention requirements of the RMP Rule are based on the requirements of the Occupational Safety and Health Administration's (OSHA's) standard: Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119).

This regulation, often referred to as the PSM Standard, was published in 1992. Although both regulations are designed to minimize the potential for and extent of accidental releases, there are differences in the chemicals and facilities they regulate.

The RMP Rule will expand the number of facilities required to have an accident prevention program and will make information about those programs readily available to the community for the first time.

The accident prevention program of many RMPs contains information on the types of hazards that may be created, process controls that prevent or minimize releases, mitigation systems used to lessen the effect of releases, and monitoring and detection systems.

Worker training, process maintenance, compliance audits, and incident investigation information is reported also.

In addition, RMPs include a summary of the accident history for the past five years of process operation. Past behavior is a useful indicator of the facility's safety culture and commitment to accident prevention.

Identifying Hazards: The Offsite Consequence Analyses

The RMP must include an offsite consequence analysis (OCA) of potential chemical accidents. Two scenarios are required of most facilities: a worst-case and an alternative case scenario. The main purpose of the analysis is to identify vulnerable populations in residences, schools, businesses, and other facilities (public receptors) and vulnerable parks, wildlife preserves, and other natural areas (environmental receptors). Identifying the scope and needs of the vulnerable areas is key to planning community response to an incident.

The OCA simulates a release and estimates how far away from the release people or property could be harmed—a "distance to endpoint." The area that is vulnerable to damage from a release will often be represented by a circle with its center at the point of release and its radius equal to the distance to endpoint. Distances to endpoint estimations can be either calculated from acceptable air dispersion models or obtained from a lookup table prepared by EPA.

All facilities must prepare worst-case scenarios. Worst-case scenarios assume that the total quantity of the substance is quickly released, that atmospheric conditions will maximize the effect of the event, and that no mitigation or response actions are taken. Worst-case scenarios can predict spectacularly long distances— more than 25 miles in some cases. However, worst-case scenarios represent a highly unlikely chain of events.

Although catastrophic releases have occurred, they are very rare. Combining these failures with worst-case weather conditions makes the overall scenario even less likely. But such events can and may indeed happen.

Many facilities must also prepare alternative release scenarios, which are based on more credible, realistic factors. For example, the scenario can assume that mitigation measures (e.g., dikes, shut-off valves, fire sprinklers) operate as designed and environmental conditions are typical, rather than the worst possible. The scenario may even be based on the facility's accident history. Alternative release scenarios represent more likely events, providing more practical information to emergency planners and the public.

Preparing for Accidents: Emergency Response Programs

Despite prevention measures, accidents do happen. Therefore, the RMP Rule requires facilities to have an emergency response program if their worst-case release scenario can have an offsite consequence.

The emergency response program must include a plan for informing the public and local emergency response agencies about accidental releases. The plan must be coordinated with the community emergency response plan. In addition, the emergency response program must also include procedures for the use, inspection, testing, and maintenance of emergency response equipment, as well as training for employees in relevant procedures.

Facilities whose employees will not respond to accidental releases do not need to develop an emergency response program if they take certain measures: Facilities must notify emergency responders when there is a need for response. Facilities with regulated flammable substances must coordinate response actions with the local fire department. Facilities with regulated toxic substances must be included in the community emergency response plan.

The emergency response provisions of the RMP Rule build on EPCRA's emergency planning provisions, encouraging facilities to coordinate their plans with community emergency planners and responders.

Writing a Story: Questions to Think About

- How effectively has the LEPC or other emergency management organizations developed and tested emergency plans required under EPCRA?
- How will local chemical emergency planning and response organizations use RMP information to improve safety (e.g., through emergency response, hazard reduction, or zoning restrictions)?
- Who would be affected by a release? How would these vulnerable populations know that an emergency is occurring and how to respond?
- How will local officials and the public perceive the risk of accidental releases? What factors will they consider to determine risk from the chemical hazards reported on the RMP?
- Has the public's perception of the facility's safety and environmental record led them to trust the facility?
- Are local facilities with chemical inventories prepared for a major release? Have they developed emergency response plans? Are the plans current and have exercises been conducted to test them? Has the facility communicated with neighbors and developed working relationships with community response organizations?
- How many affected facilities are there in the community? What is their accident release history?
- Has the facility changed its operations to improve prevention and response as a result of the need to complete the RMP? Are they undertaking any hazard reduction actions to lower the quantity and number of chemicals? Has the facility improved accident prevention design and procedures? How does a facility's program compare with others in its industrial classification?

Balancing Right-to-Know and Security: Risk Management Planning in the Information Age

The Clean Air Act mandated that EPA make RMP information readily available to the public. Through public disclosure, Congress intended to save lives, reduce accidents, limit pollution, and protect property.

Initially, EPA planned to post all of the data on the Internet—freely available to all.

However, on November 5, 1998, EPA announced it would not include the OCA portion of the RMP data in the online database because this particular information could be used by terrorists to identify mass casualty targets.

The Chemical Manufacturers Association (CMA) took the lead role to prevent the distribution of OCA data on the Internet.

CMA asserted that a database of chemical inventories and OCAs universally available on the Internet could make chemical facilities ready targets for terrorists. James Solyst, CMA Team Leader for Information Management/ Right-to-Know, remarked that while the CMA supports the RMP Rule, "… making the worst-case scenario data available via the Internet is a bad idea, given the times in which we live." Solyst continued that putting this data on the Internet "… will increase the risk of terrorist attacks."

The Federal Bureau of Investigation supported CMA's position and helped persuade EPA to reverse its earlier policy of free Internet access.

In contrast, public interest groups argued that full disclosure remains the best option to safeguard the public.

Paul Orum, Coordinator of the Working Group on Community Right-to-Know, asserted "… the need to reduce real hazards (chemicals) in the community cannot be accomplished by withholding data from the public. Broad distribution and public awareness of worst-case hazards through the Internet is the only effective way to motivate companies."

Obtaining OCA data will be a challenge. Public interest organizations that maintain right-to-know Web sites such as the Environmental Defense Fund (Chemical Scorecard) and the Unison Institute (RTKNET) have not indicated whether they will distribute the data themselves.

Having RMP data not only on the public record, but also easily accessible and searchable online, would have provided reporters an opportunity to develop local stories.

Nevertheless, there are alternative sources for locating this essential hazard information.

As of May 1999, all RMP data is still subject to the Freedom of Information Act (FOIA)—although congressional initiatives maybe underway to block this avenue.

(For more information on the debate, see The National Safety Council Environmental Health Center's April 1999 issue of Environment Writer at the NSC EHC Web site) LEPCs or SERCs are another source. So are the regulated facilities; many, in fact, have already been communicating their RMPs in a variety of public forums. CMA is recommending that its members share RMP data with the community.

Informing the public about risks they face is something many reporters consider a key part of their job.

They are often the translators through which technical information is compiled, interpreted, and relayed to a broader public.

RMP data should provide local journalists with the raw material for many stories. Open information was a key to the strategy Congress and EPA envisioned for improving public safety.

Funding: The Perennial Problem

Although EPCRA established the infrastructure and mandate to conduct local emergency planning, the availability of resources to support these efforts sometimes limits a community's ability to prepare for emergency responses.

Similarly, the RMP Rule gives emergency management groups information that better enables them to protect the public.

However, the lack of direct federal funding to support these activities may hamper their ability to use the information.

Many state and local governments see EPCRA and the RMP Rule as positive additions to their public safety efforts and are incorporating them into their programs.

Others just do not have the resources to implement another requirement in an already over-burdened agency.

Some implementing agencies address the funding issue by charging facilities fees for EPCRA activities to offset the operational costs.

Others rely on industry contributions.

Implementing the Rule: Variations from State to State

EPCRA gives states flexibility in the structure and operation of the SERCs and LEPCs.

For example, California has 5 LEPCs, while New Jersey has 587. Just as structure and resources vary, so does effectiveness.

Although some SERCs and LEPCs have established excellent working relationships with the facilities that report to them and the community they serve, others have had less success.

Many RMP Rule programs will actually be administered and enforced by state and local agencies.

These agencies must request and be delegated from EPA the right to implement the Risk Management Program within their jurisdictions.

Otherwise, EPA remains responsible for implementing the rule. As of April 1999, Florida, Georgia, Puerto Rico, and the Virgin Islands had been delegated responsibility for managing the Risk Management Program.

Twelve other states and two counties are also seeking delegation to manage their own programs. Check EPA's Web site or the Right-to-Know Hotline for the most current information.

Both EPCRA and the RMP are "minimum rules." Implementing agencies have the option of adding reporting requirements, chemicals, and threshold quantities.

California's Office of Emergency Services, for example, has already indicated that it intends to modify the RMP Rule to be consistent with its own requirements.

Evaluating Risk: It's Up to Local Communities

The RMP offers communities information on chemical hazards; the frequency and severity of previous chemical releases; and the measures taken to either prevent, minimize, or respond to an accidental release.

It does not provide information on the risks these chemicals present to the community; that is, the probability of an accident occurring, its potential effect, and what the event would mean to the community.

EPA believes that identifying risk is best left to stakeholders in the community:

> Preventing accidental releases of hazardous chemicals is the shared responsibility of industry, government, and the public. The first steps toward accident prevention are identifying the hazards and assessing the risks. Once information about chemicals is openly shared, industry, government, and the community can work together toward reducing the risk to public health and the environment.

EPA, Risk Management Planning: Accidental Release Prevention—Final Rule: Clean Air Act Section 112(r), Office of Solid Waste and Emergency Response, 550-F96-002, May 1996

Determining the likelihood of these scenarios is difficult because the data needed (e.g., rates for equipment failure and human error) are not usually available.

Even when data are available, significant uncertainties remain in applying the data because each facility's situation is unique.

The probability of an event occurring is only part of the risk equation.

How right-to-know information is communicated will affect the community's perception of the risk posed by accidental chemical releases.

The perception of risk will be shaped by the community's ability to understand the nature of potential hazards; facilities' ability to control, mitigate, and respond to those hazards; and, the community's ability to manage emergencies.

A community's reaction to perceived risk is tempered by other factors, such as local industry's relationship with the community and socioeconomic factors that are important to the community.

In collaboration with LEPCs and SERCs, a number of industries are launching public risk communication and education programs to help explain RMP data and to initiate discussions about risk within the community.

Journalists are a primary source of information that the community will rely on to determine risk.

The story is not only about worst-case scenarios, but also about more probable outcomes.

The story includes what facilities are doing (or failing to do) to prevent accidents and the capabilities of facilities and communities to respond to an incident.

The probability of chemical accidents occurring compared to the probability of other catastrophic events (such as an earthquake) also puts the story into perspective.

EPA 550-B-99-015, May, 1999

GUIDES TO CHEMICAL RISK MANAGEMENT: Evaluating Chemical Hazards in the Community: Using an RMP's Off-site Consequence Analysis

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The Environmental Health Center produced this guide under cooperative agreement CX 826604-01-0 with the U.S. Environmental Protection Agency.

It is part of a series of publications on the Risk Management Program Rule and issues related to chemical emergency management.

Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequence Analysis

Chemical incidents that cause fatalities, injuries, and property damage occur all too frequently. Fortunately, catastrophic incidents such as the 1984 methyl isocyanante release in Bhopal, India, are extremely rare. But the potential for disaster is always present.

According to the CSB, for the years 1987 through 1996, an average of 60,000 chemical releases, spills, and fires occurred annually—42 percent of the incidents occurred at fixed facilities.

The CSB estimates that during this 10-year period, 2,565 people were killed or injured by chemical incidents.

Hazardous substances in the community present both reporting opportunities and challenges.

Chemical names, quantities, locations, and health effects, as well as populations vulnerable to a release, are key story elements.

But frequently this information is difficult to obtain. The Risk Management Program Rule (RMP Rule), a new U.S. Environmental Protection Agency (EPA) regulation set to take effect June 21, 1999, will provide some answers by (1) requiring regulated facilities to conduct a hazard assessment and (2) making it available to the public.

The hazard assessment will consist of an inventory of listed substances, a five-year history of releases, and an offsite consequence analysis (OCA).

The OCA is the centerpiece of the hazard assessment; it is an estimate of harm to people and the environment beyond the facility's fenceline that can result from a chemical release.

The OCA answers four basic questions needed to understand a chemical hazard:

- What hazardous substance(s) could be released?
- How much of the substance(s) could be released?

- How large is the hazard zone created by the release?
- How many people could be injured?

The History of the RMP Rule

The RMP Rule builds on the earlier emergency planning and community right-to-know efforts implemented under EPCRA. Under EPCRA, facilities are required to file reports if the quantities of the hazardous chemicals exceed specified thresholds.

In 1987, EPCRA launched another important right-to-know program called the Toxics Release Inventory. Under this program, facilities report emissions of hazardous substances to EPA.

With these programs, EPCRA extended right-to-know beyond the workplace and into the community.

In 1990, Congress took additional measures to protect communities from hazardous chemicals by including accident prevention and emergency preparedness measures in the CAA of 1990. Section 112(r) of the CAA authorizes EPA to develop regulations that prevent and prepare for accidental releases.

These regulations are contained in the Accidental Release Prevention Requirements: Risk Management Program Rule, also known as the RMP Rule (40 CFR Part 68).

The RMP Rule focuses on preventing accidental chemical releases, reducing risk to the community from exposure to hazardous chemicals, and minimizing the consequences of releases on the environment.

The RMP's primary goal is to protect communities from releases of toxic or flammable chemicals that are prone to cause immediate, serious harm to public and environmental health.

Flammable and toxic chemicals that can cause severe, acute health effects are covered under the rule; pyrotechnic and explosive chemicals are not.

Facilities such as chemical plants, oil refineries, propane retailers, fertilizer warehouses, ammonia users, and water treatment plants, must comply with the EPA's RMP Rule by submitting a summary of their RMPs to EPA by June 21, 1999.

The RMPs must be submitted if any process at a site contains more than specified amounts of 140 hazardous substances, such as propane, ammonia, or chlorine.

Hazard Versus Risk

Understanding the distinction between hazard and risk is central to using the OCA as one of the tools for determining how a community can manage hazardous chemicals. The OCA analyzes hazards.

The RMP Rule does not require a risk assessment. A hazard is something that is capable of causing harm. The bigger the hazard, the greater the capacity to cause harm (DiNardi 1997).

The hazard is based on properties intrinsic to the material and the level and duration of exposure.

For example, hydrofluoric acid is toxic, propane is flammable. Little can be done to change these characteristics.

The severity of the hazard often depends on exposure. The extent of exposure can be influenced by the quantity of the substance released, the circumstances of the release (for example, weather conditions, topography, mitigation measures), and the proximity to the point of release.

The severity of the hazard can be reduced, for example, by lowering the quantity of the chemical stored onsite or by improving facility or process design. Risk is a measure of probability.

The greater the risk, the more likely the hazard will cause harm (DiNardi 1997). Ideally, risk should be quantified—for example, a 10 percent probability that a certain event will occur.

Too frequently, however, data on rates of equipment failure and human error are unavailable, so it is not possible to reliably quantify the risk of a chemical release.

Nevertheless, we know from experience that certain events happen more frequently than others do—for example, releases frequently occur during transfer operations or process startups.

Catastrophic events, like the Bhopal tragedy, occur rarely and would be considered high-hazard, low-risk events. An incident that occurs frequently but does not generate an offsite consequence would be considered a low-hazard, high-risk event.

Predicting the Distance to Endpoint

Potential offsite consequences of accidental chemical releases are predicted by air dispersion models, which estimate the area that may become hazardous under certain conditions.

The models integrate information about chemical properties and release conditions and forecast the scenario's distance to endpoint.

Though the flow of some dense gases and vapors will be guided by terrain features, wind direction will generally control movement, creating hazards downwind from the point of release.

Since it is not possible to reliably predict when accidents will occur or what the wind direction will be when they do occur, released gases and vapors may travel in any direction.

Therefore, the total area that may be affected by a release is represented by a circle with its center at the point of release.

The radius of the circle represents the area within the circle is the hazard zone. The OCA identifies vulnerable populations and sensitive environmental areas within this circle.

Hazard zones can easily be displayed graphically on local maps that show distance to endpoint. The area within the circle is the hazard zone. The OCA identifies vulnerable populations and sensitive environmental areas within this circle.

Hazard zones can easily be displayed graphically on local maps that show vulnerable populations, such as nearby homes, schools, nursing homes, businesses, or parks and recreational areas.

These vulnerable populations are referred to in the RMP Rule as public receptors.

Environmental receptors, such as vulnerable parks and designated wildlife and wilderness areas, may also be identified.

Models in the Real World

A facility can use EPA's chemical-specific endpoints or other emergency air dispersion models to calculate the distance to endpoint.

The RMP Rule does not specify which model should be used other than the model should be one that (1) is publicly available, (2) accounts for the required modeling conditions, and (3) is recognized by industry as acceptable.

The advantage of using an air dispersion model is that it may be more accurate than EPA's methodology for predicting the mixing of pollutants in air and the distance to endpoint. However, the results of any model should be viewed cautiously since few of the fundamental algorithms used by all of the models can be verified in actual field tests.

Models are designed to simulate reality—a very complicated set of variables and interrelations that is difficult to understand and replicate.

Differences in the methods used to combine the effects of each variable can result in hazard distances that vary widely; predicted hazard distances often lie within a band of uncertainty.

Some OCA's will predict a very large distance to endpoint. Facilities must quantify distances up to 25 miles.

Still, estimating distances beyond six miles tends to be particularly uncertain because of local variations in meteorological conditions and topography.

For example, atmospheric turbulence is a major factor in determining how quickly a toxic cloud will mix with the surrounding air and be diluted.

And how quickly a cloud will be diluted to below the endpoint value will affect the distance it travels.

It is dangerous to assume atmospheric turbulence and wind speed and direction will remain constant from the point where a pollutant is being released (Evans 1998).

Where to Find EPA's Chemical-Specific Endpoints

Many facilities appear to be using EPA's chemical-specific endpoints for toxics and flammables. EPA's RMP Offsite Consequence Analysis Guidance includes a table of values for chemical-specific endpoints. EPA's endpoints are intentionally designed to be conservative, erring on the side of greater public protection. EPA's methodology is automated in a computerized application called RMP*CompTM.

The program can be downloaded from EPA's Web page for Chemical Accident Prevention and Risk Management Planning at http://www.epa.gov/swercepp/dsepds.htm.

The ready availability of these tools will help to standardize the results provided from various facilities and will enable emergency planners, community members, and facilities to more easily compare and evaluate RMP data from various processes.

Worst-Case and Alternative Release Scenarios

All RMPs are required to contain an OCA for a worst-case release scenario. If both regulated toxic and flammable substances are present in a process, separate scenarios for each type of substances must be prepared.

Many facilities will also need to prepare alternative release scenarios. Worst-case scenarios assume there is a rapid, ground-level release of the greatest possible amount of a chemical from a single vessel or pipe. Passive mitigation devices, such as dikes and containment walls around the process, may be assumed to capture or control the release if they would be likely to survive the incident.

However, active mitigation devices that require human, mechanical, or other energy to manage releases must be assumed to fail in the worst-case scenario.

In addition, weather conditions are assumed to be very mild, producing minimal mixing of the toxic gas or vapor cloud.

These conditions produce a large, stable cloud with a persistent, high chemical concentration—the most severe type of hazard. EPA states that the maximum hazard zone for worst-case scenarios may be quantified for distances up to 25 miles. (Note: Some scenarios may extend further than 25 miles, but will not be quantified beyond that point.)

Alternative release scenarios are based on more realistic factors and must have an offsite endpoint, if possible.

Facilities are given more latitude in designing these events.

Alternative scenarios may be based on the facility's five-year accident history or on a review of process hazards conducted as part of the RMP Rule's accident prevention requirements.

Unlike worst-case scenarios, the weather conditions are assumed to be typical for the area. In addition, these more likely scenarios assume that both active and passive mitigation systems operate as intended.

Facilities that do not maintain any chemicals that could cause an offsite impact and that have not had any accidents with an offsite consequence in the past five years are considered low hazard and are not required to submit the alternative scenario analysis.

Endpoints

The term “endpoint” is frequently used in the RMP Rule. Endpoints are used when facilities and emergency planners perform OCAs to predict areas that may become hazardous if dangerous chemicals are released. For accidents involving flammable chemicals, the distance to endpoint represents the area in which people could be hurt. An explosion could shatter windows and damage buildings, possibly causing injuries because of flying glass or falling debris. Therefore, a flammable endpoint represents a blast wave capable of breaking glass (one pound per square inch of pressure) or radiant heat intense enough to blister human skin.

A toxic endpoint defines the outer boundary of a concentration considered hazardous to the community. For accidents involving toxic chemicals, the distance is based on the ability of a victim to escape the area. Most people can be exposed to an endpoint concentration for one hour without suffering irreversible health effects or other symptoms that would make it difficult to escape.

People within the distance to endpoint are likely to be exposed to higher concentrations and greater hazards. Individuals exposed to higher concentrations for an extended period may be seriously injured.

The Value of Worst- Case Scenarios

Characterizing danger only by using worst-case scenarios can be misleading and unnecessarily alarming. Worst-case scenarios estimate the maximum possible area that might be affected by an accidental release. They help ensure that potential hazards to public health are not overlooked. They are not intended to represent a “public danger zone.” Nor do worst-case scenarios reflect whether processes are safe. Both safe and unsafe processes using the same chemicals at the same quantity will have similar hazards.

The objectives of the worst-case scenario are (1) to create an awareness about potential hazards at the facility and in the community and (2) to motivate a reduction of these hazards. Tim Gablehouse of the Jefferson County, Colorado, Local Emergency Planning Committee (LEPC) stressed that the issue of worst-case scenarios should not be the focus of public discussion. Instead, it should lead to an emphasis on emergency response, risk communication, and prevention efforts. The purpose of the RMP is not to generate unnecessary fear, but to educate the public about hazard reduction and emergency response.

Local emergency planning organizations can use RMPs to prepare response plans and allocate resources. Knowing who is vulnerable saves time and resources when preparing communications strategies; locating equipment; and establishing industry, community, and government working relationships.

Alternative Release Scenarios

Based on more likely conditions, alternative release scenarios offer more realistic, useful emergency planning information for the facility and the public. Facilities are given latitude in selecting credible release conditions for these scenarios and can use accident history information or other knowledge of the process for selecting the hypothetical incident.

Questions Reporters Might Ask a Facility Manager

- What hazardous chemicals do you have at the site that could endanger workers and the community? What quantities are kept onsite? What are their health effects?
- How many people could be injured in a worst-case release scenario and in a more likely alternative release? What public receptors (e.g., schools, nursing homes, and residences) did you identify? Are local emergency responders capable of handling the number of people that could be injured by such incidents? What environmental receptors (e.g., parks, wildlife sanctuaries, and wetlands) did you identify?
- What have you done to minimize Y2K and other computer problems that could affect process controls and result in a release?
- Have you secured your computer systems from outside sabotage?
- What steps have you taken to ensure site security? To fortify chemical stores?
- Did you use EPA’s methodology to determine your worst-case and alternative scenario distances to endpoint? If not, what method did you use, and why is it better than EPA’s? How do the distances compare with the ones based on EPA’s guidance?
- Can you provide a tour of the site to show how you are reducing the likelihood of a release? Can we bring our own experts?
- How is the facility reducing its hazards? By substituting less hazardous chemicals? By reducing chemical quantities? By improving safety designs and worker/contractor training?
- How will these hazard reduction initiatives increase safety?
- Is the facility willing to share its OCAs and process hazard analysis with the community?
- Do you have an uninhabited buffer zone around the site’s borders to protect neighbors?

Worst-Case and Alternative Release Scenario Parameters		
Factor Event selection	**Worst-Case Release Scenario** Produces greatest distance to offsite endpoint	**Alternative Release Scenario** More likely than worst-case scenario based on 5-year accident history or failures identified in analysis of process hazards
Mitigation	Can consider effect of passive systems that survive event	Can consider effect of passive and active systems that survive event
Toxic endpoint	From Appendix A of RMP Rule	From Appendix A of RMP Rule
Flammable endpoint	Blast wave pressure from explosion of vapor cloud	Blast wave from explosion of vapor cloud or radiant heat
Wind speed/ atm stability class	3.4 miles per hour and F class stability, unless higher wind or less stable atm can be shown at all times in last 3 years	6.7 miles per hour and D class stability or typical conditions for site
Outdoor temperature/ humidity	Highest daily maximum temperature in the prior 3 years and average humidity Liquids, other than gases	Typical conditions for site
Temperature of released substance	liquefied by refrigeration, are released at highest outdoor temperature during the prior 3 years or the process temperature, whichever is higher	Appropriate process or outdoor temperature
Surface roughness/ nearby obstacles	Urban or rural, as appropriate	Urban or rural, as appropriate
Dense or neutrally buoyant gases	Model accounts for gas density	Model accounts for gas density
Height of release	Ground level	Determined by scenario
Amount released	Greatest possible amount from a single vessel or pipe	Determined by scenario
Toxic gas release rate	All in 10 minutes	Determined by scenario
Toxic liquid releases	• Instantaneous release • Pool area is 1 centimeter deep or size of passive mitigation area • Rate at which it evaporates must be calculated	Determined by scenario
Distance to endpoint	Greatest offsite distance, up to 25 miles	Offsite, if appropriate

EPA 550-B-99-013, May, 1999

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- Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequences Analysis

About this Document

The Environmental Health Center produced this guide under cooperative agreement CX 826604-01-0 with the U.S. Environmental Protection Agency.   It is part of a series of publications on the Risk Management Program Rule and issues related to chemical emergency management.

How Safe Am I?

Helping Communities Evaluate Chemical Risks

Journalists face a tough but important task in reporting new information about potential chemical accidents. Local coverage can help the public decide whether to ignore risks or demand better management.

Population Protection: Shelter-in-Place

Shelter-in-place programs use warning signals to alert people who live near chemical plants to protect themselves from dangerous gas releases by closing doors and shutting windows.

Evaluating Chemical Risks—One Community's Story

The Richmond County School Board in Augusta, Georgia, has been accused of courting disaster by building a $20 million high school670 yards from two large chemical plants. Others in the community were not concerned. This example illustrates how information from a facility's risk management plan (RMP) can affect community decision making and benefit more than one point of view.

In July 1998, the U.S. Environmental Protection Agency (EPA) presented accident modeling data showing that the planned site for the high school was inappropriate because of its proximity to Rutgers Organics and Amoco Polymers, two plants that use large amounts of hazardous chemicals.

Richmond County Emergency Management Director Pam Tucker requested the EPA report. EPA's projected accident scenarios foreshadowed the real thing. On November 17 and 20, 1998, General Chemical Corporation in Augusta, Georgia, accidentally leased sulfur dioxide and sulfur trioxide, which become deadly sulfuric acid when they come in contact with moisture. The two General Chemical incidents sent more than 80 people complaining of eye and lung irritation to area hospitals.

The first release occurred at 2:35 p.m., while students were still in school. Students and teachers at an elementary and a middle school located less than two miles away were affected. The elementary school has a shelter-in-place program, but it received no warning of the November 17 release. There was a two-hour delay between the first release and when emergency personnel were notified.

Amoco Polymers, near where the high school is being built, stores 800 times as much sulfur trioxide as does General Chemical, according to the Augusta Chronicle. Augusta Chronicle reporters Robert Pavey and Faith Johnson were there. Johnson's November 19th story provides a concerned parent's assessment of the first accident.

"That's exactly the type of thing we're concerned about," stated Dietrich Dellerich, a member of Citizens for Fair Schooling. "We're concerned about all of the schools near chemical plants, but to put a $20 million investment under one of the plants is ludicrous. I hope and pray nothing ever happens near the new school, but you can't eliminate human error. You have to eliminate the risk."

Other Augusta citizens believe they can live with these risks, the Chronicle reported. The school board has approved the high school's construction. Seven schools, including the middle school and an elementary school affected by the November releases, are already located less than two miles from an area of Richmond County with a significant concentration of chemical plants. Deputy School Superintendent Gene Sullivan is one of those who view worry as needless.

He was quoted in a December 12, 1998, Chronicle story as saying, "The area is booming; people are buying and building homes there. We keep harping on this issue: If it's such a scary area, why are people continuing to live and move there? We are building the school where the people live."

To prevent accidents, an estimated 66,000 facilities — chemical plants, oil refineries, propane retailers, fertilizer warehouses, ammonia users, and water treatment plants — must comply with EPA's Risk Management Program Rule (RMP Rule) by submitting a summary of their RMPs by June 21, 1999. The RMPs must be filed if any process at a site contains more than specified amounts of 140 hazardous substances, such as propane, ammonia, or chlorine. Much of the information contained in the RMPs will be readily available to the public.

The RMP Rule requires these facilities to identify the hazardous chemicals they store and use, analyze the risks of these chemicals to the surrounding community, and develop emergency response plans in the event of a release. This information is summarized in the RMP. Facilities will submit the RMP to the EPA. EPA will distribute this new generation of right-to-know information dealing with chemicals and potential community hazards to state and local implementing agencies and the public.

The Augusta situation illustrates the way release projection data, like the kind that RMPs include, as well as incidents and their local coverage, have informed local citizens. Some people find the risk in this situation intolerable. Others choose to live with the risk and insist on better emergency planning from the plants, schools, and emergency response groups.

The RMP Rule

The RMP Rule focuses on preventing emergency chemical releases, reducing risk to the community from exposure to hazardous chemicals, and minimizing the consequences of releases on the environment. This is achieved by evaluating hazards, expanding industry accident prevention programs, and coordinating facility and community emergency response programs.

RMPs will be of interest to community members, including the news media, because they provide new information about areas vulnerable to toxic and flammable chemicals. This information can be used to alert the public to chemical risks, allowing people to learn about their community's vulnerability.

An RMP does not identify the specific levels of risk, nor does it tell communities what to do about potential problems. These are local decisions. The media can assist communities in obtaining and interpreting RMP information, identifying previously unknown hazards, and presenting options for coping with these hazards. Such efforts can lead communities to increase their interaction with facilities, which in turn can lead facilities to further reduce the risks.

Why Cover This Story?

Many communities will be interested in learning about hazardous chemicals that can jeopardize their health. They also will be interested in finding out the level of risk posed by local facilities.

Chemical hazards are more likely to be addressed if local stakeholders—people who would be affected by an accident—know about potential problems and have a say in their solution.

Stakeholders include individuals such as company managers, workers, and stockholders; neighboring residents and workers; and local officials.

More than a decade ago, the Emergency Planning and Community Right-to-Know Act (EPCRA) began providing communities with information about the size of local facilities' chemical inventories and the amounts of hazardous chemicals they release.

Local emergency planning committees (LEPCs) and local emergency authorities have used that information to plan for and respond to incidents. The information provided by an RMP can help communities determine if current emergency plans are adequate.

Different communities will reach different decisions about the information they learn from RMPs. According to Carole L. Macko of the EPA's Chemical Emergency Preparedness and Prevention Office, "The final evaluation of risk will be made by the public and officials at the local level."

Without local coverage, though, RMPs will be like the proverbial tree that fell in the remote forest without being heard.

News audiences will be interested in the reactions of local emergency authorities, government officials, business leaders, facility managers, neighbors, and environmental groups to RMP content.

News coverage can help people evaluate their options. Some communities may think they have to live with poorly managed hazards when there may be alternatives. Once they know about hazards and risks, communities can choose to use or ignore that knowledge.

How to Get RMPs

EPA assumes that the majority of the RMPs will be submitted electronically, and the agency plans to make all but the offsite consequence analyses (OCAs) available to the public over the Internet by September 1, 1999.

The information will be available through the RMP*Info database. Check EPA's Web site at www.epa.gov/ceppo to locate RMP*Info.

From this database, the news media can learn about local chemical hazards by merely typing in ZIP codes of interest.

The Clean Air Act mandated that EPA make RMP information readily available to the public. Through public disclosure, Congress intended to save lives, reduce accidents, limit pollution, and protect property.

Initially, EPA planned to post all of the data on the Internet — freely available to all. However, on November 5, 1998, EPA announced it would not include the OCA portion of the RMP data in the online database because this particular information could be used by terrorists to identify mass casualty targets.

The regulated industries, led by the Chemical Manufacturers Association (CMA) and the Federal Bureau of Investigation, successfully lobbied EPA to withhold this information from RMP*Info.

As of publication of this backgrounder, all RMP data is still subject to the Freedom of Information Act— although congressional initiatives maybe underway to block this avenue. (For more information on the debate, see the National Safety Council Environmental Health Center's April 1999 issue of Environment Writer at the NSC EHC Web site) LEPCs or State Emergency Response Commissions (SERCs) are another source for RMPs.

So are the regulated facilities; many, in fact, have already been communicating their RMPs in a variety of public forums. CMA is recommending that its members share RMP data with the community.

Reporters should periodically review RMP*Info and other sources. New information may create opportunities for new stories.

New sites may open, or existing sites may expand their chemical inventories to the point at which they exceed a threshold quantity so they must submit an RMP. Sites must also revise their RMP if processes change or accidents occur.

Identifying Hazards

Communities will be interested in the hazard assessment information provided in RMPs. This section will contain information from the OCA on (1) a worst-case toxic release, (2) an alternative toxic release, (3) a worst-case flammable re lease, or (4) an alternative flammable release. Worst-case and alternative release scenarios identify the area and population that may face a hazard if these events occur.

The media and other concerned parties can use graphic representations to display areas that may be in danger from these events.

In addition, the Rutgers Center for Environmental Communication Outreach Materials About Risk Management Plans: Guidance from Pilot Research provides information on the most effective designs for these particular graphics for communicating to the public.

The impact of worst-case release scenarios will often be the most sensational part of an RMP.

As explained in more depth in the companion publication, Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequence Analysis, these scenarios assume that catastrophic accidents occur under extreme, specified conditions.

Worst-case scenarios assume that the total quantity of the substance is quickly released, that atmospheric conditions will maximize the effect of the event, and that no mitigation or response actions are taken.

Though these scenarios represent an extremely unlikely chain of events, they provide a way to compare the maximum consequences that can result from different processes. This comparison enables emergency planners and others to rank processes by priority for further scrutiny.

Many facilities must also develop and report analyses of alternative release scenarios. These scenarios provide a more realistic prediction of hazards that can be created by accidents.

They will often predict hazards that are much less dramatic than those forecast by worst-case release scenarios. The scenario may even be based on the facility's accident history.

Alternative release scenarios provide more practical information to emergency planners and the public.

The extent to which design of the process can limit and control releases is reflected by the alternative release scenario.

These more useful scenarios also provide an important indicator of the degree to which emergency response planning helps to reduce hazards that may be created.

News media willing to pursue and report OCA information will provide many community members with their only view of this vital information.

EPA will make most of the RMP data available on the Internet (with the major exception of the OCAs), including data on registration, accident history, accident prevention, and emergency response.

This information must be considered with OCA data when identifying risk. An RMP includes the accident history of the facility's process for the past five years.

Combined with local knowledge of other incidents at the facility, the facility's track record provides an important indicator.

The RMP also summarizes the facility's emergency response plan.

Its ability to cope with releases, and the community's ability to respond to emergencies, are also very important risk factors to consider.

What Questions Do Citizens Want Answered?

Experts say that when citizens learn about hazardous chemicals used near them, they most want answers to questions such as—

- What are the health effects of hazardous substances at the site?
- Are community injuries or deaths likely from this site's hazards?
- How does it affect the environment?
- Is the facility addressing this potential risk?
- Are there alternative chemicals that can be used?
- Are community planners and responders aware of the facility's emergency response plans?
- How can I independently verify this chemical risk information?
- Is the facility reducing, eliminating, and preventing possible risks?

What's Safe?

RMPs present communities with complex decisions. The news media can assist citizens in determining whether local chemical hazards should be ignored, eliminated, reduced, or better managed by considering what counts as safe for facilities and communities.

The following discussion can help reporters sift through the information and provide communities with guidelines for evaluating facilities.

The past is prelude to the future. To assess the level of commitment to safety, reporters researching a story may want to look at the RMP section that details a facility's five-year accident history.

The five-year accident history may be the most informative section of an RMP. A history of safety is generally a good predictor of future safety.

Safe facilities have several high-level personnel anticipating and addressing chemical safety problems. Research conducted by Caron Chess et al. (1992) suggests that top-level managerial commitment to safety increases the likelihood that organizations make improvements as a result of independent safety inspections, accidents, and community input.

Chess continues to say that safety should not be either one person's concern or everyone's. She found that organizations that perform well at risk management employed several top managers to identify and solve safety problems.

In fact, healthy competition developed between the managers, and bad news was more apt to travel upwards. The production manager, safety manager, environmental engineer, vice president for public relations, industrial hygienist, and the human relations manager all wanted to claim credit for identifying and solving problems (Chess et al. 1992).

Budget allocations suggest priorities. Safe facilities have managers who take proactive steps to identify safety problems.

Instead of waiting for accidents to reveal weaknesses, these facilities have line items in their budgets to conduct routine safety audits, inspections, and emergency drills.

They secure multiple, independent safety audits from international, national, and local inspectors. Sometimes they use monetary rewards to encourage line workers to alert supervisors to safety problems.

Emergency response is built on strong industry–government working relationships. Donna Majewski is responsible for safety at Great Lakes Chemical (GLC) in West Lafayette, Indiana.

Several years ago, that facility had an accidental release of bromine, a chemical somewhat similar to chlorine in its capacity to harm lungs and eyes.

Two workers were hospitalized because of the release, and children at a nearby daycare center were evacuated.

Majewski said that before the accidental release, GLC had no representation on the Tippecanoe County LEPC.

After the release, and the adverse publicity resulting from it, GLC management has been much more visible and helpful in addressing chemical safety concerns. For example, Majewski now meets regularly with the Tippecanoe County LEPC. She chairs its vulnerability committee, which attempts to identify problems throughout northwest Indiana in hazardous chemical management before they become tragedies. The company also has sophisticated hazardous materials response equipment it now shares with the community. Safe facilities encourage and learn from community input. One company that uses community concern to improve its operations is Sybron Chemicals of Birmingham, New Jersey.

In 1988, Sybron released an acrid-smelling substance that caused area firefighters to evacuate citizens. In addition, a plant fire at the company seriously injured two workers. The community became hostile toward the company because of these incidents. Top management might have reacted by stonewalling. Instead, the company invested money and time in developing systems that used community input to make the facility safer. The company installed the Prompt Inquiry and Notification System (PINS), a telecommunications systems that can automatically dial Sybron's neighbors in the event of an emergency. In the inquiry mode, PINS works like a sophisticated answering machine and plays recorded messages about the plant's status to those who call in.

Callers can also leave messages requesting further information. Sybron does not use the PINS system to placate neighbors but rather to spot problems and fix them. Managers are rewarded for their responses to PINS inquiries. Another innovative step Sybron has taken is to train volunteers to identify and report odor problems in a precise way. Safe facilities are situated in communities with high safety standards, regular inspection programs, and an assertive LEPC.

Communities have the power to insist that those who handle hazardous chemicals do so responsibly. Two mechanisms for enforcing local safety standards are routine inspections and active LEPCs. In large communities like Fairfax, Virginia, the county government routinely inspects and issues operating permits to drycleaning plants, printers, newspapers, and other facilities that handle hazardous substances. For example, Steve Dayton, manager of the MBC Reproexpress copy shop in Fairfax, says that when he used anhydrous ammonia to produce blueprints, Fairfax County inspectors appeared periodically to ensure that his ammonia tanks were chained to the wall, as local codes required.

In less populated areas, inspection may be more a matter of routine conversations between the emergency authorities like the fire chief and facility managers. Whether inspection is a formal or an informal process, its use should reduce the risks associated with hazardous substances.

Effective LEPCs result in strong emergency management programs. Another indicator of local government's alertness to its role in preventing chemical accidents is the adequacy of the LEPC. LEPCs should meet regularly to identify trouble spots. Typically, LEPCs include local emergency management directors, fire chiefs, industry leaders, interested citizens and, occasionally, media representatives. According to Tim Gablehouse, a Denver-area attorney and former emergency responder, LEPCs have significant authority, if they choose to use it. He says they can ask for any information that's relevant to preventing accidents. Acceptable risk will vary by community and even location within the community. One community's infrastructure, environment, budget, and regulatory framework might be able to handle certain chemical processes that create intolerable risks in another. A community might believe hazardous substances are used safely within a company's walls, but want their LEPC to inquire about the routes used to transport hazardous substances into their areas.

For example, Gablehouse lives near the Rocky Mountains. Rocky Mountain delivery routes for hazardous chemicals add an extra element of risk that Gablehouse's area must consider. In Baton Rouge, Louisiana, the LEPC invites a U.S. Coast Guard representative to meet with its members to help them plan for emergencies involving hazardous chemicals carried by Mississippi River barges.

Safe facilities operate in communities with alert local media. The news media can help communities interpret local RMPs by following some of the steps taken by Augusta Chronicle reporters who had access to RMP-like information in 1997. Meghan Gourley, who covered some of these 1997 stories for the Chronicle, said the biggest obstacle she encountered came from plant managers' worries that her stories would panic the public.

"The idea is to be up front, but fair," Gourley said. "In no uncertain terms, say [in a story] that worst-case scenarios are practically impossible. Focus on those scenarios that are more likely. Be sure to detail not only the elements of the disaster, but what steps officials are taking to help prevent the disaster." Gourley recommends asking facility managers lots of questions and suggesting they answer as though the reporter was a teenager.

Community Reaction

In communities like Augusta, Georgia, where RMP-like information has already been reported, citizens generally have reacted by being concerned about their personal safety. They have tended to decide they are willing to live with hazardous chemical risks if facilities can ensure good warning and emergency response systems. Once accidents occur, communities are often less tolerant. The news media can assist both communities and facility managers by helping facilities develop risk management or risk reduction plans the community finds acceptable, instead of waiting for accidents that harm people.

How Effective is your LEPC?

LEPCs play a key role in managing chemical hazards in the community. Congress envisioned the LEPCs to identify chemical hazards, plan for emergencies, communicate risk, and engage all stakeholders in a common goal of public safety. Questions to pursue include the following:

- Does the LEPC have a broadly based membership? Does it meet regularly?
- Does the LEPC have information on hazardous chemical inventories throughout the community available for review?
- Have vulnerable populations (e.g., schools, nursing homes, hospitals, residences) been identified?
- Has the LEPC prepared and kept current site-specific emergency response plans?
- Has the LEPC conducted drills and exercises?
- Has the LEPC developed and communicated evacuation or shelter-in-place strategies?
- Have hazard analyses been integrated into fire and police response plans?

Writing a Story: Questions Reporters Might Ask a Facility Manager

- Who is in charge of safety? What are their names and duties?
- What safety programs are in place?
- Why does the facility use hazardous chemicals? Could the facility reduce reliance on them or do without them? Would doing so improve community safety?
- What routine training is provided for those who conduct emergency response?
- What are some ways the facility and the LEPC predict or anticipate accidents?
- How often does the facility conduct emergency response drills? When was the most recent one? What was learned?
- Does the facility have warning sirens that alert the community to dangerous releases? Do workers and neighbors recognize them? When was the last time they were tested?
- Were accident prevention and emergency plans developed internally or was outside help used?
- Describe some of the routine steps taken to ensure safety. Describe steps taken to maintain equipment and operate it safely.
- Does the facility use internal or independent, third-party audits to evaluate the adequacy of the accident prevention program?
- Does the facility send a representative to the community's LEPC meetings? If so, who? Does this individual communicate routinely with the community about safety and emergency response?
- What worries the plant manager the most about safety at the facility?
- If the facility is a chemical manufacturer, reporters can ask engineers to describe the codes of practice involved in Responsible Care, a safety program developed by the Chemical Manufacturers Association, and for illustrations of how those practices are implemented.

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The Current Status of the Risk Management Program Rule

As of the publication date of this backgrounder, key elements of EPA's Risk Management Program Rule are still not final. Public access to the offsite consequence analysis data continues to be debated.

EPA has not officially decided on how it will respond to Freedom of Information Act requests.

The agency has said that while the offsite consequence analysis data will not be distributed to the public on the Internet, it will supply paper copies of the data upon request.

Also, EPA intends to increase the reportable quantity of hydrocarbon fuels (i.e., propane).

Concurrently, the U.S. Court of Appeals granted an interim stay of the Risk Management Program Rule as it applies to facilities using propane in a process.

For the most current information, see http://www.epa.gov/ceppo.

For More Information

The NSC is maintaining the Chemical Emergency Management Web site at www.nsc.org/ xroads.htm as a resource supplement to this series of publications.

The site is a directory of Risk Management Program-related links to organizations, regulations, chemicals, rules, and regulations involved in emergency management and the safe handling of chemicals.

A selection of articles and papers written about the Risk Management Program Rule and local efforts to identify and analyze risk in the community is also included.

The site will be constantly expanding as industry and communities develop new information required under the Risk Management Program Rule.

Other Publications in this Series

Other documents in the Guides to Environmental Risk Management Series are listed below:

- New Ways to Prevent Chemical Accidents
- How Safe Am I? Helping Communities Evaluate Chemical Risks
- What Makes a Hazard Hazardous: Working with Chemical Information
- Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequences Analysis

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New Ways to Prevent Chemical Incidents

Dr. Paul L. Hill, chairman and chief executive officer of the Chemical Safety and Hazard Investigation Board (CSB), told Congress on February 24, 1999, "In 1996, chemical incidents claimed the lives of the equivalent of two fully loaded 737 passenger jets—256 people perished. And an average of 256 people died the year before. And the year before that."

From 1987 to 1996, the most recent year for which full data are available, about 605,000 potentially dangerous commercial chemical incidents were reported, according to the CSB's 600K Report: Commercial Chemical Incidents in the United States 1987–1996. And according to the CSB, many incidents still go unreported. The 600K Report details some staggering statistics:

- An average of 60,000 incidents occur per year, totaling 605,000 over the 10-year period.
- These more than 600,000 incidents resulted in 2,565 deaths and 22,949 injuries during that time period. Of these, 333 deaths and 9,962 injuries occurred at fixed-site facilities.
- Forty-two percent of incidents reported between 1987 and 1996 occurred at fixed-site facilities; 43 percent of these incidents occurred in transit.
- General equipment failures and human error were key causes of incidents at facilities.

To help prevent accidents in the future, an estimated 66,000 facilities—chemical plants, oil refineries, propane retailers, fertilizer warehouses, ammonia users, and water treatment plants —must comply with the Risk Management Plan Rule (RMP Rule) by June 21, 1999. Facilities must file risk management plans (RMPs) if any process at the site contains more than specified amounts of 140 hazardous substances such as propane, ammonia or chlorine. RMPs detail information about hazards that can be caused by chemical releases and activities to prevent chemical accidents and prepare for emergencies. Much of this information will be available to the public.

The RMP Rule focuses on preventing accidental chemical releases, reducing risk to the community from exposure to hazardous chemicals, and minimizing the consequences of releases on the environment. The rule requires facilities to identify the hazardous chemicals they store and use, analyze the risks of these chemicals to the surrounding community, and develop emergency response plans. This information is summarized in the RMP. The RMPs must include the following:

- An offsite consequence analysis (OCA), which examines potential risk to the community
- A five-year accident history of releases and incidents
- Reports on incident investigations
- A summary of efforts to prevent accidents from occurring
- Plans for responding to potential spills and releases

Facilities will submit the RMP to the U.S. Environmental Protection Agency (EPA). EPA will distribute this new generation of right-to-know information about chemicals and potential community hazards to state and local emergency planning agencies and the public.

The Impact of Right-to-Know

Just like EPCRA, the intent of the RMP is to reduce risks without command-and-control government regulations. The theory is that public knowledge will create public pressure, which will motivate companies to operate their plants more safely. Does this work? Toxics Release Inventory data, along with other regulatory and industry initiatives, suggest that right-to-know has been a key factor in reducing chemical emissions released by nearly 46 percent from 1988 through 1996 (Mason 1999).

The accident prevention information in RMPs will help local communities judge the risk from accidental chemical releases. The extent of accident prevention activity can provide an indication of how serious the facility management is about controlling hazards. The news media and other community members can explore whether facilities are doing what their RMPs indicate.

A New Era

The Clean Air Act (CAA) Amendments of 1990 ushered in a new era in preventing or reducing accidental releases of hazardous chemicals. Section 112(r) of the CAA makes three federal agencies chiefly responsible for preventing chemical catastrophes: EPA, CSB, and the Occupational Safety and Health Administration (OSHA).

Section 112(r) requires OSHA to establish regulations that protect workers from chemical spills and releases. These regulations were issued as the Process Safety Management of Highly Hazardous Chemicals Rule, also known as the PSM Standard (29 CFR 1910.119).

Under Section 112(r), EPA was required to establish regulations to protect the public from unintentional chemical release. These regulations are contained in the Accidental Release Prevention Requirements: Risk Management Program Rule, also known as the RMP Rule (40 CFR Part 68). Flammable and toxic chemicals capable of causing severe, acute health effects are covered under the rule; pyrotechnic and explosive chemicals are not.

Section 112(r) also created a new independent federal agency, the CSB. The agency does not have regulatory authority. Its chief responsibility is to investigate chemical incidents. CSB investigative reports are made public, which could help to deter or prevent future incidents and releases.

PSM Versus RMP

Although the accident prevention provisions of the RMP Rule closely parallel OSHA's PSM, there are several significant differences. For example, the PSM Standard affects about 30,000 industrial facilities. The RMP Rule affects nearly 66,000 facilities, including retail and government entities. Under the PSM Standard, employers must only provide chemical accident prevention information to employees, not to the public. The RMP, with the exception of confidential business information, is public information. Therefore the RMP serves as a community right-to-know vehicle for the PSM Standard since it includes a summary of the facility's accident prevention program.

Three Levels of Safety

Not all facilities are treated alike. The processes regulated by the RMP Rule are divided into three levels—Program 1, 2, and 3— based on the scope of hazards from the processes and the facility's accident history. Each level has different compliance requirements. Program 1 processes represent the least public threat from an offsite chemical release. To qualify as Program 1, a facility —

- Must not have experienced an accidental release with an offsite consequence in the prior five years
- Must have a worst-case scenario release that could not affect the public

Because these programs pose less hazard to the community, they are subjected to limited hazard assessment, prevention, and emergency response requirements. Program 1 processes must coordinate emergency response plans with local responders.

Program 2 processes are not eligible for Program 1, yet are not as hazardous as Program 3 processes. Program 2 has been referred to as "PSM Lite." These processes must —

- Perform a hazard review of the process and regulated substances.

- Identify potential equipment malfunctions or human error.
- Take steps to monitor or detect releases.

Program 3 processes, the most hazardous, must perform a rigorous, step-by-step hazard analysis of processes, equipment, and procedures to identify each point at which an accidental release could occur. See the table for a comparison of the accident prevention requirements of the three programs and the PSM Standard.

Diagnosing Hazards

Accident prevention begins with analyzing operations to identify equipment and procedure failures that could lead to unplanned spills and releases. The RMP Rule requires Program 3 processes to conduct what is formally known as a process hazard analysis (PHA). Program 2 processes, which are generally less complex than Program 3, also must identify potential failures, but a formal PHA is not required.

PHAs identify areas where improvements can be made in system design, operating procedures, training, and other accident prevention strategies. PHAs must be carefully scrutinized since many other aspects of risk management programs are based on the findings and recommendations of these analyses. Information from PHAs will likely be used as the basis for the alternate release scenarios developed as part of OCA. The OCA will then be used to develop facility and community emergency response plans.

Summary of Key Accident Prevention Compliance Requirements

Requirement	PSM Standard	RMP Program 3	RMP Program 2	RMP Program 1
Compile written process safety information	X	X	X	
Establish employee participation in and access to process safety analysis and management	X	X	X	
Analyze process hazards	X	X	X	
Prepare written operating procedures	X	X	X	
Conduct worker training	X	X	X	
Conduct contractor training	X	X		
Conduct safety review before startup	X	X		
Ensure ongoing integrity of equipment	X	X	X	
Manage process changes	X	X		
Conduct incident investigations	X	X	X	
Conduct compliance audit	X	X	X	
Coordinate emergency response plan with community	X	X	X	X

Known Safety Measures

Human and mechanical errors are the major causes of spills and releases (see chart below). Accident prevention programs should seek to identify problem areas and resolve them. Some examples of known safety measures follow.

Worker Training Prevents Accidents. Most incidents occur because of a combination of unsafe conditions and unsafe acts. Proper training of workers can minimize the number of accidents.

The RMP Rule requires workers and contractors who are involved with the regulated processes to receive appropriate training. Worker refresher training must be given at least every three years.

Facilities must document specifically who was trained and when and how they verified that the employees understood the training.

Maintaining Mechanical Integrity of Process Equipment Reduces Risk. Higher hazard facilities must prepare written preventative maintenance procedures to ensure the mechanical integrity of the process equipment and controls.

The RMP Rule requires documentation of tests and inspections of equipment and controls. The frequency must be consistent with manufacturers' recommendations and good engineering practices.

Incident Investigations Prevent Future Accidents. Despite effective accident prevention efforts, accidents and "near-misses" will occur.

Facilities with Program 2 and 3 processes are required to investigate and report incidents that resulted in, or could have resulted in, a catastrophic release of a regulated chemical.

Investigations are aimed at determining the cause or causes of incidents and recommending changes that can prevent recurrence. Facilities must document resolutions and corrective actions. Implementation of these corrective actions can play an important role in reducing future risk.

Auditing Keeps Programs Up-to-Date. Higher hazard facilities must evaluate their compliance with the RMP Rule's accident prevention requirements at least every three years. The facilities must report the findings of the audit to EPA and correct any deficiencies.

The purpose of the audit is to verify that the procedures and practices developed under the standard are adequate and are being followed.

The periodic audits also provide an opportunity to ensure that operating procedures, policies, and training programs have been modified to reflect changes in processes. An ongoing facility audit program is a positive sign of an active safety culture.

Reducing Hazards Improves Safety. Substituting less hazardous chemicals and reducing onsite inventories are effective ways to lower hazards.

According to environmental activist Fred Millar, a member of the Washington, D.C., Local Emergency Planning Committee (LEPC), the city's Blue Plains wastewater treatment facility maintained a large enough quantity of chlorine to threaten Capitol Hill, nearby Bolling Air Force Base, and other Department of Defense buildings.

The LEPC convinced Blue Plains to explore replacing chlorine with much less hazardous sodium hypochlorite (bleach).

Verifying Compliance

Scarce resources may limit the ability of OSHA, EPA, and the states to audit RMPs. Although many facilities are operated safely, community scrutiny often will be key to ensuring that facilities complete reliable audits and respond to identified weaknesses. Some suggestions to help verify compliance follow:

- Assess the scope and frequency of training and how trainees are evaluated to determine whether they have learned what they need to know.
- Verify whether equipment used in regulated processes is inspected and maintained as indicated in an RMP.
- Determine whether all incidents are investigated and reported as required by the RMP Rule.
- Examine a facility's five-year accident history of regulated processes that must be submitted as part of the RMP. The frequency of reported incidents and accidents may reveal potential weaknesses in a facility's accident prevention program.
- Evaluate whether facilities have the necessary federal and state permits for their releases of hazardous substances.

Determining Reliability

One way to help determine the reliability of a particular facility's RMP information is to compare it with other reports the facility has completed.

Regulated process operators will often have a variety of reporting obligations in addition to the RMP. For example, Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) requires reporting on the identities and quantities (but not the uses or process) of specific extremely hazardous substances.

Sections 311–312 of EPCRA require many of the same facilities to submit chemical inventory and facility identification information to State Emergency Response Commissions (SERCs) and LEPCs.

In addition, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly referred to as Superfund, requires that facilities notify the National Response Center, local EPA regional office, SERC, and LEPC of chemical releases.

Determining whether all required information has been submitted to the appropriate entity, and the extent to which reported values agree, can provide an indication of the reliability of particular RMP information.

Terrorism and Facility Security

The chief of the FBI's Domestic Terrorism Section, Robert Burnham, testified before Congress on February 10, 1999, that the FBI believes chemical facilities are a terrorist target because they contain hazardous substances that can cause mass casualties and, consequently, are a security risk to the community.

The Chemical Manufacturers Association agrees with this position.

To reduce the risk of a terrorism, the online RMP*Info database of worst-case and alternate scenario data from RMPs will not be posted on the Internet.

Nevertheless, the facility's physical plant remains a security risk, and reporters should ask about this vulnerability.

Gardner Bates of the Chlorine Institute noted that physical security has always been a significant concern and priority within the industry. Since security details are sensitive, he suggests that reporters arrange a facility tour to obtain more information. The LEPC might be helpful in gaining access.

Key questions to determine risk are —

- How effectively does the facility secure its perimeter? What are its access policies and controls?
- Can personnel be located and tracked within the facility?
- Does the facility and/or its parent company have a program in place to safe-guard its databases and communications?
- Are there protective buffer zones between chemical operations and neighbors?
- Are hazardous operations fortified against bomb attacks?

Y2K Issues

Most people think of the Year 2000 problem, or Y2K, as affecting only computers and the data they contain plus the potential impact on financial institutions, personnel data, and Social Security checks.

But increasing attention is now being paid to the widespread Y2K problem on electronic devices with embedded chips used to regulate processes and safety equipment in chemical facilities.

Embedded chips or embedded systems abound in the chemical industry. These include microprocessors and computer chips embedded in many chemical process controls and sensor devices. Processes at chemical facilities are primarily computer controlled. Consequently, relief valves and other safety features may not operate correctly.

Dr. Gerald V. Poje, Board Member and Y2K project coordinator of the CSB, noted that "… chemical safety concerns include complete failure of safety-related systems, both for control and protection; malfunctions of embedded microprocessors and equipment; and potential failure to respond correctly to program instructions." Computer-related process failures have the potential to produce small to catastrophic consequences.

In its Year 2000 Issues: Technology Problems and Industrial Chemical Safety report issued in March 1999, the CSB asserts that large chemical companies have the capability and resources to resolve their Y2K problems, assuming continuity of the powergrid. However, medium and small companies present a special concern because of lack of information and suggestions that much more work still needs to be done.

Key Y2K Questions to Ask Facilities

- Have facilities examined and tested their systems?
- Do facilities have contingency plans in place?
- Have facilities accounted for potential power and communications failures?
- Are LEPCs and SERCs involved in Y2K planning issues?

Writing a Story: Questions to Think About

The following questions may help elicit more information about accident prevention programs at facilities regulated by the RMP Rule. Questions for the plant manager or facility spokesperson:

- What are the top three or four actions being taken in the next 12 to 18 months to protect the local community from accidental chemical releases?
- What steps are taken to promptly notify the local community of chemical releases from the facility?
- What steps or processes are in place for informing the local citizens of progress in preventing accidental chemical releases at the facility?
- What steps should local citizens follow to obtain more information about the dangers of the chemicals at the site, and what actions are taken to protect the local community?

Questions for contractors who currently or recently worked in the facility:

- What safety and accident prevention information and instructions were received before you began work at the site?
- What do you think of the effectiveness of the chemical safety and accident prevention programs at this facility?
- What concerns do you have about conditions that might lead to a chemical release that could harm workers and citizens?
- How does this facility's accident prevention and safety effort compare to those of other similar facilities where you have worked in the past?

Questions for local officials such as the fire chief, fire marshal, or LEPC chairman or executive director:

- What visits to the plant or facility have you made and what impressed you most about what you saw?
- What information has been exchanged between the facility manager and the local community?
- Does this information fully satisfy all of the facility's obligations to the local community?
- What steps can local citizens take to obtain information about the facility's chemical hazards and chemical release prevention efforts?
- What major community hazards are created by the facility and how are they being addressed or controlled?

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The Current Status of the Risk Management Program Rule

As of the publication date of this backgrounder, key elements of EPA's Risk Management Program Rule are still not final. Public access to the offsite consequence analysis data continues to be debated.

EPA has not officially decided on how it will respond to Freedom of Information Act requests.

The agency has said that while the offsite consequence analysis data will not be distributed to the public on the Internet, it will supply paper copies of the data upon request.

Also, EPA intends to increase the reportable quantity of hydrocarbon fuels (i.e., propane).

Concurrently, the U.S. Court of Appeals granted an interim stay of the Risk Management Program Rule as it applies to facilities using propane in a process.

For the most current information, see http://www.epa.gov/ceppo.

For More Information

The NSC is maintaining the Chemical Emergency Management Web site at www.nsc.org/ xroads.htm as a resource supplement to this series of publications.

The site is a directory of Risk Management Program-related links to organizations, regulations, chemicals, rules, and regulations involved in emergency management and the safe handling of chemicals.

A selection of articles and papers written about the Risk Management Program Rule and local efforts to identify and analyze risk in the community is also included.

The site will be constantly expanding as industry and communities develop new information required under the Risk Management Program Rule.

Other Publications in this Series

Other documents in the Guides to Environmental Risk Management Series are listed below:

- New Ways to Prevent Chemical Accidents
- How Safe Am I? Helping Communities Evaluate Chemical Risks
- What Makes a Hazard Hazardous: Working with Chemical Information
- Evaluating Chemical Hazards in the Community: Using an RMP's Offsite Consequences Analysis

About this Document

The Environmental Health Center produced this guide under cooperative agreement CX 826604-01-0 with the U.S. Environmental Protection Agency. It is part of a series of publications on the Risk Management Program Rule and issues related to chemical emergency management.

What Makes a Hazard Hazardous: Working with Chemical Information

On November 17, 1998, an error at a General Chemical Corporation facility in Augusta, Georgia, resulted in the release of an airborne mixture of chemicals that included sulfur trioxide vapor. Nearly two hours passed before the county's emergency management officials were notified of the hazard.

Fifty-one people in the surrounding community sought treatment for minor eye, throat, and lung irritation. When the same process was restarted three days later, a cloud of sulfur dioxide gas was released, which was an expected part of the process. No additional notifications were required. But unexpected weather conditions kept the cloud from dispersing, as it was supposed to do. Exposure to the cloud forced 39 workers at an adjacent facility to seek medical treatment for symptoms that included shortness of breath; burning and irritation of the eyes, nose, and throat; and nausea and vomiting.

Unfortunately, chemical releases, fires, and explosions occur frequently. The Chemical Safety and Hazard Investigation Board (CSB) found that approximately 60,000 hazardous chemical releases were reported annually from 1987 through1996. The good news is that few of these incidents resulted in injuries or deaths. The bad news is that some did.

Although critical reporting on controversial public health issues does not require coursework in toxicology and chemistry, some understanding of these subjects is clearly helpful. Understanding a hazard often comes down to knowing the following factors:

- A chemical's health effects
- The concentration of exposure
- The duration of exposure

Hazardous chemicals in the community are important stories. But toxicology is not a routine part of journalism school curricula. Still, a little toxicology can go a long way.

Such terms as IDLH, ERPG, endpoint, risk, distance to endpoint, level of concern, and toxic concentration are tools of the trade for emergency managers in government and industry to describe the health risks associated with hazardous substances in the community.

This backgrounder is a brief primer to prepare reporters working with chemical information.

The New RMP Rule

To help prevent accidents like the Augusta incidents in the future, an estimated 66,000 facilities -- chemical plants, oil refineries, propane retailers, fertilizer warehouses, ammonia users, and water treatment plants -- must comply with the Risk Management Plan Rule (RMP Rule) by June 21, 1999.

Facilities must file risk management plans (RMPs) with the U.S. Environmental Protection Agency (EPA) if any process at the site contains more than specified amounts of 140 hazardous substances such as propane, ammonia, or chlorine. These 140 substances include 77 toxic gases and liquids and 63 flammable gases and volatile liquids.

RMPs detail information about hazards that can be caused by chemical releases and activities to prevent chemical accidents and prepare for emergencies. Much of this information will be readily available to the public.

The RMP Rule focuses on preventing accidental chemical releases, reducing risk to the community from exposure to hazardous chemicals, and minimizing the consequences of releases on the environment. The rule requires facilities to identify the hazardous chemicals they store and use, analyze the risks of these chemicals to the surrounding community, and develop emergency response plans. This information is summarized in the RMP.

Toxic or Flammable?

The RMP Rule regulates 77 acutely toxic and 63 flammable substances. All of the listed substances can form gas or vapor clouds that may travel offsite and have dangerous consequences if more than a threshold quantity is released. Though some chemicals have both toxic and flammable properties, a substance is only placed in one of the categories -- the one in which the hazard is greatest.

For example, sulfur trioxide is one of the 77 toxic gases and liquids governed by the RMP Rule. Although sulfur trioxide may ignite if it contacts organic or other combustible materials, its toxic properties are of greater concern. Therefore, the EPA lists it as a toxic chemical.

Hazard Versus Risk

A hazard is something that is capable of causing harm. The bigger the hazard, the greater the capacity to cause harm (DiNardi 1997). The hazard is based on properties intrinsic to the material and the level of exposure. Hydrofluoric acid is toxic, propane is flammable.

Little can be done to change those characteristics. The severity of the hazard often depends on exposure. Exposure can be measured by the quantity of the substance released and the circumstances of the release (for example, weather conditions, topography, or mitigation measures).

Exposure can be reduced, for example, by lowering the quantity of the chemical stored onsite or by implementing design improvements.

The hazard assessment requirements of the RMP Rule direct facilities to determine the consequences of a release of toxic chemicals outside the grounds of the facility. Once the consequences of a spill are determined, they can be used to predict how large an area will be affected by a hazardous incident.

They also identify the population and sensitive environments within that area.

Risk is a measure of probability. It refers to the likelihood that an event will occur (DiNardi 1997). The greater the risk, the more likely it is that the hazard will cause harm. The likelihood is based on several variables, including the possibility of a release, the hazard created by the quantity of a chemical released, and the potential impact of the release on the public and the environment.

Ideally, risk should be quantified -- for example, a 10 percent probability that a certain event will occur. Too frequently, however, the data related to rates of equipment failure and human error are unavailable, so it is not possible to reliably quantify risk.

Nevertheless, we know from experience that certain events occur more frequently than other events -- during transfer operations or process startups, for example. Catastrophic events, -- like the Bhopal tragedy, occur rarely and would be considered high-hazard, low-risk events. An incident that occurs frequently yet does not generate an offsite consequence would be considered a low-hazard, but high-risk event.

RMPs only provide information on the potential impact of a release, not the likelihood it will happen. RMPs do not quantify the probability of an event occurring because data related to rates of equipment failure and human error are usually not available.

Recognizing Chemical Hazards

The first step in recognizing a hazard is to identify the chemical or chemicals that could be released. Identification is relatively simple when pure materials or refined, final products are involved. But identification can be more difficult if the release could occur while mixtures are undergoing reaction and several raw materials or reactive products are involved.

For example, because the Augusta incidents occurred at different stages in the same chemical process, different chemicals were released by the two events.

The reaction of released chemicals may make it difficult to identify them and their hazards. For example, sulfur trioxide reacts with humidity and other water sources to create sulfuric acid. Although sulfuric acid is not regulated by the rule, it does have corrosive properties that make it dangerous.

While the RMP Rule regulates chemicals when a process contains an amount greater than a specified threshold quantity, these chemicals can also create hazards when present in amounts less than the regulated quantities. For example, sulfur trioxide is regulated by the RMP Rule when more than 10,000 pounds are present in a process. But because the Augusta site only stores a maximum of 3 70 pounds of sulfur trioxide, the RMP Rule would not apply.

The amount and duration of a chemical release can affect the size of the area subject to the hazard, so it is often important to be able to identify how much material is released for how long. Government representatives questioned the Augusta chemical plant's initial report of the quantity and duration of the sulfur trioxide release because a larger-than-predicted area was affected.

Variation in the chemicals released and the conditions under which they are released can affect the severity of a hazard. The sulfur dioxide release in Augusta on November 20, 1998, demonstrates some of the difficulties in recognizing and predicting hazards because it was an expected and permissible startup event. Even so, a hazard was created -- 39 people sought medical treatment.

Although this type of release normally dissipates quickly without impact, weather conditions on that day caused the vapor cloud to settle on the ground. The event has reportedly prompted the EPA to reconsider whether maximum allowable emission levels should be lowered.

Properties of Hazardous Substances	
Property	**Influence(s)**
Physical State	• The physical state of the substance affects its ability to move after it is released into the environment.
Vapor Pressure	• Gas clouds stop forming when the leak is stopped. Liquids can continue to form a cloud after the leak has stopped, increasing exposure time.
Density	• The higher the vapor pressure, the faster the chemical evaporates and the more concentrated a vapor cloud may become. • Heavy gases tend to create a larger hazard. They tend to settle at ground level, increasing their contact with living things.

What's Hazardous – Which Chemicals and Why?

The physical state of a substance -- solid, liquid, or gas -- affects its ability to diffuse after it is released into the environment. All of the chemicals regulated by the RMP Rule are either gases or liquids that can evaporate quickly. Unlike solids, volatile liquids and gases can readily create large chemical clouds that can move offsite.

This is what happened in the Augusta incidents. Sulfur trioxide is a volatile liquid, and because it can evaporate rapidly, it formed a vapor cloud that affected people several miles away. Sulfur dioxide is a gas, and its release formed a cloud that moved quickly into the nearby community.

Whether a released chemical is a gas or a liquid can influence the hazard it creates. A cloud is likely to be more hazardous if the community is exposed to it for a longer time. Gas clouds stop forming when the leak is stopped; however, liquids can continue to form a cloud after the leak has stopped.

Without the means to control the spill, liquids can continue to evaporate, increasing the length of time a community can be exposed to its vapors. The faster a liquid evaporates, the more concentrated its vapor cloud may become. The higher the concentrations of chemical, the greater the hazard.

When choosing the chemicals to regulate, EPA considered the accident history of chemicals. Some chemicals that could be a health risk arc not regulated by the RMP Rule because they are not widely used or not likely to be involved in accidents that significantly affect communities.

Measuring Evaporation

The vapor pressure value is an index of how quickly a liquid will evaporate. The higher the value, the faster the chemical evaporates. Most toxic liquids regulated by the RMP Rule have a vapor pressure of at least 10 millimeters of mercury (mm Hg) at ambient temperature, usually assumed to be 68 °F.

Only two regulated toxic substances have a vapor pressure less than 10 mm of mercury. As a point of reference, the vapor pressure of water is 23 mm Hg. Sulfur trioxide has a vapor pressure of 344 mm Hg at the same temperature, indicating that it can quickly evaporate and create a cloud of a high chemical concentration.

The concentration of the chemical in a cloud is also influenced by the volume of the spill, the rate at which the release occurs, and the size of the area from which a liquid spill can evaporate.

Another important property is the density of the gas or vapor. Many gases regulated by the RMP Rule are termed heavy or dense gases because they are heavier than air. Heavy gases tend to create a greater hazard because they tend to settle at ground level, increasing their contact with living things.

Air has a density of 1; sulfur dioxide has a vapor density equal to 2.26, an example of a heavy gas. High humidity at the time of the November 20, 1998, release in Augusta helped trap the sulfur dioxide gas, allowing it to sink before it could be diluted and swept away by the wind. Instead, it settled close to the release site, affecting 39 workers at the adjacent chemical plant.

Some neutrally buoyant gases are also regulated by the RMP Rule. They have densities closer to that of air, so they tend to neither float nor sink in the atmosphere. Wind and atmospheric turbulence play a large role in determining the extent to which releases of these chemicals affect communities.

Exposure and Toxicity

The human body metabolizes different toxins at different rates, and individual rates vary. When an individual's rate of exposure exceeds the body's ability to metabolize it, the toxin accumulates. When it accumulates to a certain concentration, severe injury or death may occur.

Dose is measured by the quantity of chemical to which an individual is exposed over a given period. Chemicals vary in potency or toxicity.

A highly toxic chemical, such as sulfur trioxide, can cause harmful effects from exposure to a small amount in a short time. Less toxic chemicals require larger doses or longer exposure times to cause effects.

Toxic chemicals regulated by the RMP Rule are all acutely toxic, meaning they cause adverse health effects shortly after exposure.

They may affect various parts of the body, resulting in several types of health effects. For example, sulfur trioxide dissolves readily in water, creating a corrosive solution of sulfuric acid.

Exposure could result in eye and respiratory irritation (such as that experienced by victims of the Augusta release, skin burns, and gastrointestinal tract burns).

Toxic Endpoints

The term endpoint is used frequently in the RMP Rule. Endpoints are used when facilities and emergency planners perform offsite consequence analyses to predict areas that may be subject to hazardous substances.

A toxic endpoint defines the outer boundary of a concentration considered hazardous to the community.

Most people can be exposed to an endpoint concentration for one hour without suffering irreversible health effects or other symptoms that would make it difficult for them to escape.

People within the area up to the endpoint are likely to be exposed to higher concentrations. Individuals exposed to higher levels for an extended period may be seriously injured. Toxic endpoints are expressed as a concentration of the chemical in the air.

Four Methods of Predicting Responses to Chemical Exposure

Source	Agency/ Organization	Exposure Period	Population Protected	Goal
IDLH	NIOSH	30 minutes	Healthy, adult	Escape exposure workers without respirator
1/10 IDLH	EPA	30 minutes	General population	Allow the public to escape a hazardous area
ERPG-2	AIHA	60 minutes	General population	Prevent effects that could impair the ability to take protective action
TLVs	ACGIH	8 hours	Most workers	Work consistently with no harmful effects

Predicting Responses to Chemical Exposure

It is difficult to predict reliably whether communities will face a hazard when they are exposed to endpoint concentrations.

Though workplace exposures to many chemicals have been well studied, relatively little information is available about community exposure to the same chemicals.

Therefore, toxic endpoints used by the RMP Rule are often based on conclusions drawn from workplace data. The general population, more than the workforce in a facility, consists of individuals who may be more sensitive and less able to protect themselves -- the very young, the very old, and the infirm.

The EPA used four different sources of information about responses to chemical exposures when they selected toxic endpoints specified by the RMP Rule:

1. Immediately Dangerous to Life and Health (IDLH). These values and their equivalents represent the most commonly used source of toxic endpoints.

IDLHs were originally developed by the National Institute for Occupational Safety and Health (NIOSH) to guide employee respirator selections.

Airborne concentrations above IDLH values are believed to pose a threat to healthy, adult workers who are exposed for more than 30 minutes. Excessive exposures are likely to cause immediate or delayed, permanent, adverse health effects or prevent escape from the hazardous environment.

Questions have been raised about whether IDLH values can be used to protect members of the general population who may be unable to escape exposure within 30 minutes.

2. One-tenth IDLH (1/10 IDLH). This measure cuts the acceptable exposure level by a safety factor of 10 and helps to compensate for exposures longer than 30 minutes. It also compensates for potentially higher sensitivities that can be expected within the general population.

The EPA's manual, Technical Guidance for Hazards Analysis, also known as the Green Book, helps local emergency planning committees conduct the hazard analyses required by the Emergency Planning and Community Right-to-Know Act.

The Green Book recommends using the conservative, very protective 1/10 IDLH measure as a level of concern (LOC) -- a threshold concentration of an airborne pollutant, usually at which a hazard to people is believed to exist.

Although emergency planners may use other values when selecting an LOC and estimating hazards created by releases, many Local Emergency Planning Committees (LEPCs) use the value of 1/10 IDLH values as the standard. Toxicologists have refined the toxic endpoints for some chemicals since the Green Book was written in 1987.

EPA believes that endpoints used by the RMP Rule represent better science. Many emergency response planners will be faced with the challenge of adjusting community response plans to account for differences between RMP endpoints and the LOC values they used previously.

3. Emergency Response Planning Guidelines (ERPG). ERPGs were developed by the American Industrial Hygiene Association (AIHA).

These guidelines provide three tiers that predict the range of effects from a one-hour exposure. The RMP Rule uses the second tier values, ERPG-2, as endpoints for nearly 30 toxic chemicals.

ERPG-2 are tolerable-effect thresholds that represent the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action.

The ERPG values estimate how the public will react to chemical exposure.

Unlike many other exposure guidelines, the ERPG values do not incorporate safety factors that allow for individual differences in sensitivities; hypersensitive individuals may experience more severe effects at lower concentrations.

Therefore, ERPG values are better used for emergency planning purposes, rather than serving as rigid standards for public protection.

4. Threshold Limit Values (TLVs). TLVs are the endpoints for two regulated chemicals. TLVs were established by the American Conference of Industrial Hygienists (ACGIH).

These occupational exposure limits represent concentrations to which workers may be exposed repeatedly for an 8-hour shift and a 40-hour week without suffering adverse health effects.

Most are intended to protect healthy male workers. Therefore, they may not be adequate for protecting the very young, the very old, and the infirm.

Writing a Story: Questions to Consider

Questions for Plant Managers

- What chemicals do you have onsite that-can cause injuries to the public? What dangerous chemicals do you have onsite that are not listed in the RMP regulation? Can you supply an MSDS or other chemical hazard information?
- How dangerous are these chemicals? Are they toxic, flammable, or explosive?
- How reactive are these chemicals to water, heat, or other substances? Could this reactivity result in an explosion or exposure to an even more dangerous chemical?
- Have toxicity or exposure studies been conducted on these chemicals? Have these studies been verified by credible scientists?
- What are you doing to reduce hazards? For example, reducing chemical inventories, substituting less hazardous chemicals, improving process design, providing training and management controls.
- Are the endpoints you use for your worst-case and alternative scenarios adequate to protect the public?

Questions for the LEPC

- Have you obtained documentation of the chemicals onsite from EPCRA and other regulatory filings? Are the documents consistent with the RMP?
- How does the RMP hazard assessment compare with the worst-case scenario developed by the LEPC?

Dangers of Flammable Chemicals

- Clouds of flammable gases or vapors are dangerous because they may result in one or more of the outcomes listed as follows:
- Vapor cloud fire (flash fire)
- Pool fire (burning of large puddles)
- Jet fire (pressurized gas or liquid escaping from a hole)
- Boiling Liquid, Expanding Vapor Explosion (BLEVE) (an explosive release of expanding vapor and boiling liquid following the catastrophic failure of a pressurized vessel holding a liquefied gas, such as propane)
- Vapor cloud explosion (a more violent flash fire)

Explosions can significantly affect communities near accident sites. Powerful shock waves may directly cause injuries and property damage. Shrapnel and structural damage created by the blast may result in additional injuries. Fires resulting from chemical releases generally do not have an offsite effect; they are typically confined to the property where the incident occurs.

Sites with potential for large fires often establish distance between the manufacturing processes that handle flammable materials and the end of the property line.

That distance usually prevents fires from spreading offsite. The heat radiating from a fire may be more likely to cause injuries and property damage in the nearby community.

Flammable Endpoints

Releases of flammable chemicals do not usually lead to explosions; they are more likely to become diluted by air mixing before they can ignite.

As with a car's engine, if the fuel is not rich enough, it will not ignite. If it does ignite, a fire is more likely than an explosion.

Fires usually are concentrated at the facility, so people who are within a half-mile or less face the greatest danger if an accident occurs.

The RMP Rule specifies that three endpoints may be considered when analyzing release scenarios for the 63 flammable gases and volatile liquids regulated by the RMP Rule:

1. Increases in air pressure resulting from a vapor cloud explosion. This endpoint must represent an increase in air pressure by 1 pound per square inch (psi). A 1 psi pressure increase is intended to be conservative. It does not define a level at which severe injuries or death would be expected. Though a 1 psi shock wave will not cause direct injury, it will break windows and may cause other property damage that could result in injuries. Some people within an area exposed to a 1 psi overpressure may be hurt, but not everyone. Because glass shards and other shrapnel from an explosion may travel a distance greater than the 1 psi shock wave, it is possible for injuries to result beyond the 1 psi endpoint.
2. Radiant heat of 5 kilowatts/ meter2 (kw/m2) for 40 seconds resulting from a fireball or pool fire. Human skin exposure to radiant heat of this intensity for more than 40 seconds causes second degree burns or blisters, at a minimum.
3. A chemical's lower flammability limit (LFL). The LFL represents the minimum percentage of flammable chemical in air that must be present for ignition to occur. When a gas or vapor is diluted to a concentration below its LFL endpoint, it can no longer create a fire hazard.