REGION 6 Preparedness, Response, and Prevention Update

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RMPs – the Real Story

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Many companies out there handling certain hazardous chemicals will soon need to submit a risk management plan (RMP) to EPA.

Recently, we've heard quite a few horror stories from a number of companies about the RMP requirements.

We've also heard more than a few "myth information" stories. Here are some of the issues and the real story.

Issue: We already comply with the [fill in your favorite federal or state rule, industry code, or standard] so we don't need to do an RMP.

EPA: It would be extremely unusual for any company handling hazardous materials to not already comply with a variety of rules, codes, and standards.

This is why the RMP builds on these rules, codes, and standards; you can use compliance with them to satisfy particular RMP elements!

A big advantage of the risk management program is that it can consolidate these rules, codes, and standards so all the elements needed for safe operation work together to prevent accidental releases.

Managing all these elements under one roof can help reveal gaps in information about hazards or 'layers of protection' and fill these gaps to reduce the risk of an accidental release.

While other rules, codes, and standards may address certain RMP requirements, none captures all of the RMP elements.

For example, assessing the off-site impacts associated with accidental releases and communicating this information to the first responders and the community are not addressed by any other rule, code, or standard.

Issue: We have no technical people and can't do the RMP; it will take too long; we need a contractor and it will cost thousands of dollars.

EPA: If your facility is a large, complicated petrochemical complex, you may need some technical support.

However, the people responsible for running a process have more knowledge than anyone else; they should be able to step through the RMP requirements and complete the work successfully.

RMP*Comp™ is a computer program that can quickly help you with your worst-case and alternative case scenario assessments.

RMP*Submit™ is a computer program that you can use to quickly fill out the RMP form for submission.

Actually, you could use RMP*Submit™ first to quickly go through and focus on the elements that need attention.

And the best news is that both of these of these tools are free!

Issue: The RMP is only about worst-case; the worst-case means releasing everything from your site; when the public sees the worst-case, we'll be run out of town; and we have to prepare an emergency response plan for the worst-case.

EPA: The RMP is not just about worst-case.

The RMP is about accident prevention, risk reduction, and dialog with first responders and the community about hazards, prevention, and emergency preparedness.

An emergency response plan does not have to be built around the worst-case.

But certain aspects of the worst-case should be considered in the emergency planning process.

For example, releases in a certain wind direction and distance may affect the capability of emergency teams to reach the accident site.

The worst-case scenario has dominated everyone's attention because of the perception that it is a real prediction or that it will actually happen.

It is only a scenario.

It communicates the notion that if you did not have a prevention program in place, here's what might happen.

Once you've communicated this, you can then show what could really happen (the alternative scenario), what you are doing to make sure that accidents are prevented, and what you will do if something does go wrong.

Several companies have already rolled out their worst-case scenarios, accident prevention programs, and emergency response plans to the public.

Most often, the public has come away with a better understanding of what's going on, a greater appreciation of company efforts, and a recognition of why and what they need to do in an emergency.

Issue: We have to publish maps pinpointing the location of the worst-case along with the 'death zones' or 'circles of death.' Somebody could use this information to harm the company or the community.

EPA: There is no requirement in the RMP to publish maps pinpointing the source of the worst-case or any other off-site consequence assessment element.

However, maps are extremely useful for communicating with the public about the accidental release scenarios.

Many companies have used maps to show escape routes, prevailing wind directions and first responder routes for emergency planning.

EPA indicated that a valuable way to quickly share RMP information with states, first responders, and the public is via the Internet.

However, EPA agrees that off-site consequence information could be misused if posted on the World Wide Web.

Consequently, off-site consequence information (worst-case scenarios, etc.) will not be published on the Internet.

While EPA plans to post the rest of the RMP information on the Web, the Agency is working with state and local governments and industry groups to develop ways to share off-site consequence information with the public.

Anhydrous Ammonia Theft Alert

Problem

Anhydrous ammonia is used as an agricultural fertilizer and industrial refrigerant.

The substance is stored and used at farm cooperatives, 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 that 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, farm cooperatives, 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 incidents 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 firefighter, 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 criminal 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 maintenance, safe handling, and operating 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 -28 degrees Fahrenheit.

At this temperature it 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 off-site consequence analysis required by the Risk Management Program (RMP) Rule under Section 112(r) of the Clean Air Act.

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.

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.

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 anhydrous ammonia contaminated with lubricating oil (e.g. in a refrigeration system), however, may have a much broader 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 get what he needs.

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 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 corrodes brass valving, which is typically used on propane cylinders.

When inside inappropriate pressure 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.

For example, in addition to other appropriate PPE, in some cases it may be necessary to wear cryogenic gloves with a moisture barrier to protect against frostbite and 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 a 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.
- Be suspicious of unfamiliar individuals seeking to purchase anhydrous ammonia that may not have a legitimate need for the product.
- Consider installing valve locks or fencing, especially for unattended tanks.*
- Report thefts, signs of tampering, leaks, or any unusual activity to local law enforcement.
- 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, facilities that have anhydrous ammonia refrigeration systems should consider monitoring system levels for abnormal losses, especially following weekends or other periods where the facility is not occupied.

Also, refrigeration facilities may want to evaluate the benefits of installing lockable, quarter-turn, spring-loaded, ball valves in a series with a plug or manual valve in critical areas such as at the fill point or oil pot.

Agricultural retail establishments should be aware that they may be approached by individuals wanting to purchase ammonia for the 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

The Alaska DEC fact sheet on preventing accidental releases of anhydrous ammonia is available at: http://es.inel.gov/techinfo/facts/alaska/ak-fs03.html

CEPPO 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 Fertilizer Institute (TFI) has a brochure on "Theft of Anhydrous Ammonia" available at www.tfi.org or (202) 675-8250.

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

The National Response System (NRS)

The National Oil and Hazardous Substances Response System is the federal government's mechanism for response to discharges of oil into navigable waters of the U.S., and releases of chemicals Into the environment.

The system provides a framework for coordination among federal, state, and local responders and responsible parties.

The NRS is described in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), found in Title 40 of the Code of Federal Regulations, Part 300.

The NCP establishes three organizational levels: The National Response Team (NRT), Regional Response Teams (RRTs), and On-Scene Coordinators (OSCs).

Area and Local Planning

Subpart C of the NCP describes the roles and responsibilities for planning at the federal, state, and local levels to achieve a coordinated planning and response system.

The NCP is based on legislative authorities including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), EPCRA, and the Clean Water Act (CWA) as amended by the Oil Pollution Act of 1990 (OPA 90).

OPA 90 required the establishment of Area Committees comprised of federal, state, and local agency representatives.

Under the direction of a federal OSC, Area Committees develop Area Contingency Plans (ACPs) and coordinate them with state plans and LEPC plans. LEPC plans should be coordinated with applicable ACPs and state emergency response plans.

National Response Center (NRC)

Created by the NCP, the NRC is charged with receiving notifications of all radiological, oil, chemical, and biological releases for the federal government. Located in the Coast Guard Headquarters, the NRC immediately relays reports to the predesignated OSC.

The National Response Team (NRT)

The National. Response Team's membership consists of 16 federal agencies with responsibilities, interests, and expertise in various aspects of emergency response to pollution incidents.

The EPA serves as chair and the Coast Guard serves as vice-chair of the NRT The NRT is primarily a national planning, policy; and coordinating body and does not respond directly to incidents.

The NRT provides policy guidance prior to an incident and assistance as requested by an On-Scene Coordinator via a Regional Response Team during an incident. NRT assistance usually takes the form of technical advice, access to additional resources/equipment or coordination with other RRTs.

NRT Member Agencies

Environmental Protection Agency
United States Coast Guard
Department of Agriculture
Department of Commerce
Department of Defense
Department of Energy
General Services Administration
Department of Health and Human Services
Department of Interior
Department of Justice
Department of Labor
Department of State
Department of Treasury
Federal Emergency Management Agency
Department of Transportation
Nuclear Regulatory Commission

Regional Response Teams (RRTs)

There are, 13 RRTs, one for each of ten federal regions, plus one for Alaska, one for the Caribbean, and one for the Pacific Basin. Each RRT maintains a Regional Contingency Plan (RCP) and has state, as well as federal government, representation. EPA and the Coast Guard co-chair the RRTs.

Like the NRT, the standing RRTs are planning, policy, and coordinating bodies and do not respond directly to the scene. The RRT provides assistance as requested by the OSC during an incident. If the assistance requested by an OSC exceeds an RRT's capability, the RRT may request assistance from the NRT.

The RRT may either be alerted by telephone or convened as a group. RRTs can convene on scene, at the request of the OSC, in the form of an incident-specific RRT. RRTs may also provide assistance to state and local governments in preparedness, planning, and training for response.

RRTs may review plans at the request of the LEPC. One of the primary purposes of the RRT review is to offer follow-up technical assistance to SERCs and LEPCs that might enhance local planning.

On-Scene Coordinators (OSC)

The OSC is a federal official predesignated by EPA for inland areas and by the Coast Guard for coastal areas. (Inland/coastal boundaries are specified in individual Regional Contingency Plans.) The OSC coordinates all containment, removal and disposal efforts and resources during an incident.

These include federal, state, local and responsible party efforts. The OSC has access to the special forces discussed below to support response efforts. The OSC can also be a source of valuable support and information to the local response community.

International Involvement

The U.S. has established joint contingency plans & agreements with both Mexico and Canada to ensure coordinated and integrated preparedness and response efforts for pollution incidents that occur along the shared boundaries.

The NRT serves as co-chair of the International Joint Response Team in Mexico, which serve as the policy and advisory bodies with overall responsibility for the maintenance, promotion, and coordination of these agreements.

The NRT provides a focal point for coordinating government-to-government requests for international hazmat and oil response assistance requiring multi-agency resources.

Counter Terrorism Planning and Response

The NRS is the federal mechanism for paring for and responding to a release or threat of a release of oil, hazardous substances, pollutants, or contaminants into the environment, that may present an imminent and substantial danger to the public health or welfare (regardless of cause).

As a result, this System has key assets, responsibilities, interests, and capabilities that support other federal agencies, states, and local respond to mitigate the danger to public health/welfare from terrorism.

Resources

Assisting the OSC on request are specialists and specialized teams such as the following:

The Coast Guard's *National Strike Force (NSF)*. The NSF is composed of three strategically located teams and a coordination center. The strike teams have specially trained personnel and are equipped to respond to major oil spills and chemical releases.

The center maintains a national listing of spill equipment and assists with the development and implementation of an exercise and training for the NRS. NSF capabilities are especially suited to incidents occurring in the marine environment, but also include site assessments, safety, action plan development and documentation for inland and coastal zone incidents.

The Coast Guard's *Public Information Assist Team (PIAT*). The PIAT is a highly skilled unit of public affairs specialists prepared to complement the existing public information capabilities of the OSC.

Scientific Support Coordinators (SSCs). NOAA provides SSCs in coastal d marine areas. The SSCs serve on the OSC's staff as the head of a scientific team.

This support team provides expertise in environmental chemistry, oil slick tracking, pollutant transport modeling, natural resources at risk, environmental trade-offs of countermeasures and cleanup, information management, contingency planning and liaison to the scientific community and the natural resource trustees.

EPA’s *Environmental Response Team (ERT*). EPA's ERT is a group of highly trained scientists and engineers based in Edison, NJ and Cincinnati, OH. Its capabilities include multimedia sampling and analysis, hazard assessment, cleanup techniques and specialized technical support. EPA’s ERT provides SSCs; for the inland zone.

Reporting Requirements

Oil Spills

The CWA and OPA 90 require that the responsible party notify the NRC as soon as possible on learning of an oil spill or discharge from a vessel or facility operating:

- In or along U.S. navigable waters;
- On the Outer Continental Shelf; or
- In a deepwater port.

Gas Pipeline Releases

Releases of any toxic, corrosive or flammable gas, liquefied natural gas (LNG) or gas from an LNG facility must be reported to the NRC by the responsible party when:

- A death or injury involving patient hospitalization occurs;
- More than $50,000 damage occurs (including cost of lost gas)
- The release results in the emergency shutdown of an LNG facility; or
- An incident is deemed significant by the operator.

Further details can be found in 49 CFR 19 1.5 or at the NRT's web site: www.nrt.org.

Liquid Pipeline Releases

The responsible party must call the NRC when a pipeline system failure releases a hazardous liquid or carbon dioxide that causes any of the following:

- An explosion or fire;
- An escape to the atmosphere of more than five barrels a day of highly volatile liquid or carbon dioxide;
- A death, or injury requiring hospitalization;
- Property damage (including cost of cleanup and recovery and value of lost product) exceeding $50,000;
- Loss of 50 or more barrels of hazardous liquid or carbon dioxide;
- Pollution of any body of water; or
- An incident deemed significant by the operator.

Further details can be found in 49 CFR 195.52 or at the NRT's web site: www.nrt.org.

Transportation Accidents

Transportation accidents involving hazardous materials, including radioactive substances, must be reported to the NRC immediately by the carrier when one of the following occurs:

- A person is killed;
- A person receives injuries requiring hospitalization;

- Property damage exceeds $50,000;

- Fire, breakage, spillage, or suspected contamination occurs involving an etiologic agent or radioactive materials;

An evacuation of the general public lasting one hour or more;

- A shut down of a major transportation artery or facility for one hour or more;

- A release of a marine pollutant in a quantity exceeding 450L (119 gallons) for liquids or 400kg (882 pounds) for solids;

The operational flight pattern or routine of an aircraft is altered; or

- A situation deemed significant by the operator or carrier.

Written reports are required when any of the circumstances above are met and also when there is any unintentional release of hazardous material during transportation.

Further details can be found in 49 CFR 17 1. 15 and 171.16 or at the NRT's web site: www.nrt.org.

Chemical Releases

CERCLA requires that all releases of hazardous substances (including radionuclides) exceeding reportable quantities be reported by the responsible party to the NRC. Title 40 of the Code of Federal Regulations Part 302 promulgates reportable quantities and reporting criteria.

EPCRA requires that all extremely hazardous substances that exceed reportable quantities be reported to the NRC as well as to the SERC and the LEPC. Title 40 of the Code of Federal Regulations, Part 355, promulgates reportable quantities and reporting criteria.

Other Releases

Discharges from a hazardous waste treatment or storage facility must be reported by the emergency coordinator at the facility. Abandoned dump or waste sites should be reported by anyone having knowledge of such a site.

What LEPCs Should Be Doing
from the New York SERC

A number of LEPCs have asked what their duties and responsibilities should be.

The list below is based on a review of the Emergency Planning and Community Right-to-Know Act (EPCRA) for every mention of LEPC activities.

There are, of course, other activities that many LEPCs perform.

For now, we suggest that LEPCs make sure the requirements are covered.

- Select a Chairperson and review membership.
- Establish rules (bylaws) for the committee.
- Notify the public of LEPC meetings and availability of plan and chemical information.
- Distribute and promote. awareness of the Emergency Plan.
- Designate a coordinator for public information requests.
- Evaluate the need for resources to develop, implement and exercise the emergency plan, and make recommendations for obtaining additional resources.
- Develop the emergency plan with the required elements.
- Review the plan annually or more often if circumstances change.
- Annually publish an official notice that the plan and chemical inventory information is available to the public.
- Conduct the Community Right-to-Know Program by selecting an information coordinator to help disseminate the information collected under EPCRA.

Shelter-in-Place (SIP) vs. Evacuation: Which Is the "Right" Protective Action?
Elizabeth Gonzalez, Pasadena, Texas LEPC

Acknowledgment

The research and many articles listed in the back of this article along with the information gained from attending Conferences on *Shelter - In - Place (SIP)* are gratefully acknowledged as the basis for the information contained in this article.

Disclaimer

This is not intended for a definitive work on Evacuation and Shelter-In-Place, nor is it intended as guidance for responders. This article is intended to provide citizens with information that would help them understand the decision making process and when Evacuation or SIP might be called.

The decision as to which protective action to call for rests directly on the shoulders of the Incident Commander of a Hazardous Materials Incident. The Incident Commander has all the information necessary to make the decision to request you, the citizen, to protect yourself in place or to protect yourself by leaving the area.

The determination of which protective action to utilize is very incident-specific.

The Incident Commander (IC) must take into consideration:

- the materials involved,
- the population at risk, including both facility personnel and the general public,
- what resources will be required to implement the recommended protection action,
- the time factors involved in the release,
- the effects of meteorological conditions (present and future projections) on the control and movement of the release,
- the capability to communicate with the population at risk and
- the capabilities of the emergency response personnel to implement, control, monitor and terminate the protective action.

Evacuation and Protection in Place Are Not Either/or Options

Public Protective Actions

The strategy used by the IC to protect unexposed people from the material by protecting-in-place or evacuation.

Evacuation

The movement of people from a threatened area to a safer location. Typically regarded as the controlled relocation of people from an area of known danger or unacceptable risk to a safer area, or one in which the risk is considered to be acceptable.

Protection In Place

Directing people to go inside of a building or structure and remain indoors until the danger from a hazardous materials release has passed. It is also referred to as safe haven, sheltering, taking refuge and SIP.

Evacuation

For an area that is only threatened by a release, it should be determined whether evacuees can be evacuated before hazards reach the area. To safely evacuate the area a significant amount of lead time may be required. If it is decided to evacuate, the evacuation must be conducted in a 'well-coordinated, thorough and safe manner.

Evacuation decisions are, of necessity, very incident specific and good judgement is necessary.

To evacuate an area, the IC must (1) determine the area to be evacuated (2) secure authority (3) choose evacuation routes (4) identify needed traffic control points (5) activate warning system (6) issue appropriate instructions (7) provide transportation for those who need transportation (8) establish reception centers and public shelters (9) provide emergency medical care and traffic control personnel - just to name a few.

No amount of pre-planning can make evacuation anything but a lengthy and time consuming procedure.

In addition to the logistics involved in an evacuation, the IC must also consider the behavioral traits identified in persons faced with an emergency situation out of their control. Research shows

- Unless the family is together or missing members are safely accounted for, evacuation win not be attempted.

- Persons of limited financial means are less likely to evacuate because they are less likely to have reliable transportation, resources for sheltering, or be absent from their jobs.

- Residents with either prior knowledge of plans or who received SPECIFIC instructions during the incident were more likely to evacuate

- A high percentage of persons see evacuation as a matter of personal choice and consider alternatives. Enough information must be given so these persons can judge for themselves their personal risk and be convinced of the best action to take

- Different ethnic groups vary in what they perceive as risk, their attitude toward authority, and the credibility they place on organization which might be involved in the warning.

There are some definite advantages to utilizing evacuation as the protective action for a chemical emergency.

- Evacuees "feel" safer by traveling away from danger

- Most evacuees (65 - 76%) use an available family vehicle and many others (11I - 19%) use a relative's or friend's vehicle.

- Most evacuees (67%) go to homes of relatives and friends, or to second homes.

- Night time evacuations are as family units (whereas daytime evacuations are usually without family unity as many are at work, school, recreation, or shopping.)

- Precautionary evacuations are very effective when sufficient time is available or when the incident is under control.

- An evacuation is necessary when an accidental release could be long term or when there is real potential for explosion.

There are equally as many reasons to decide against using evacuation as a protective action..

- Requires considerable time to accomplish (may take 2 to 4 hours or longer)

- The warning message may be very lengthy since it has to identify the danger, describe the area to be evacuated, fist evacuation routes, identify public shelters, list what can and cannot be taken to shelters, etc.

- Requires setting up public shelters, traffic controls and area security and providing special transportation for those without vehicles, handicapped or on intensive care.

- Transient populations at parks, marinas, campgrounds, summer camps may not be familiar enough with area to accomplish an evacuation.

- If toxic fumes are present during the evacuation and wind changes speed/direction, evacuees could travel unaware into or through dangerous gases.

- The evacuation must be well controlled and organized with frequent credible information provided to prevent panic and erratic flight.

- Problems of coordination of effort exist when evacuees of one jurisdiction are sent to another, or where the area evacuated consists of parts of several communities.

Shelter - in - Place (SIP)

During some incidents there will not be enough time to evacuate because airborne toxicants have been released and are moving downwind rapidly. There also may be uncertainties as to what is being released, how much, what exposure levels are now and what they will be, how dangerous are such levels.

If there is a great deal of uncertainty connected with the incident (and this is common in the early stages of any incident as the IC is accumulating information) SIP may be the only practical choice.

For short term releases, often the most prudent course of action for the protection of the nearby residents is to remain inside with the doors and windows closed and the heating and air conditioning systems shut off.

An airborne cloud will frequently move past quickly. Vulnerable populations, such as the elderly and sick, may sustain more injury during evacuation than they would staying inside and putting simple countermeasures in effect. SIP may be a sensible course of action when the risks associated with an evacuation are outweighed by the benefits of in place protection.

Even when a protective decision has not yet been made, SIP should be the initial response while the emergency situation is being assessed.

As with evacuation, there are advantages and disadvantages to utilizing SIP as the protective action of choice, The IC must be fully aware of both as he makes his decisions.

The major disadvantages of SIP are:

- The general public needs to be trained on SIP actions and acceptance, as this action may be contrary to normal human nature to run from danger.

- Uncertainties may exist about whether indoor air concentrations will remain sufficiently low for a sufficiently long period of time.

- Inappropriate where releases of explosive or flammable gases could enter structures and be ignited by furnace and heater ignitions.

- May be very inappropriate for long term exposure of 12 hours or more.

- Infiltration of contaminated air into the structure over a period of time could result in high cumulative inhalation exposures unless the structure is vacated and "aired out" after the plume outdoors has passed on or dispersed.

- Those in parks, marinas, campgrounds and outdoor sporting events may not have suitable shelter available and would have to travel to such.

The advantages of SIP make it the preferred protection action.

- Protection can be provided immediately with little or no time required after warning

- The public warning message is short since it is only necessary to identify the danger, describe the area affected, describe expedients to reduce air infiltration to the home or building.

- Little or no preparation time is necessary for shelter

- The home is an ideal life support system with food, water, sanitation, medicines, bedding, clear air, communications (radio/TV, and telephone), and familiar surroundings

- May be very appropriate for short term exposures of 2 to 4 hours duration.

- Requires considerably less emergency staff support than evacuation, as public shelter, traffic control, special transportation and security personnel are not needed.

How Safe is Your Home or Building

Research done at the University of Alberta revealed that for an accidental toxic gas release that occurs over several minutes to half an hour even very leaky buildings contains a sufficient reservoir of fresh air to provide effective sheltering in place.

There has been a lot of research done into how rapidly the air within your home will become contaminated with the outside air. This research has been on-going since the first shelter air quality research done in the 1960's for "Bomb Shelters".

In an incident that involves a long release (1 to 2 hour duration) it has been found that outside air infiltrates into your home and mixes with the clean air. Using a typical air exchange rate of one hour, after one hour only 63% of the original air will have been replaced.

Using these typical air exchange rates sheltering in place is at least three times as effective as it first appears to be. These figures are affected by the structure of your home. The air exchange rate will also be affected by the expedient enhancement of the area chosen for shelter.

Most incidents will result in "peak" concentrations of contaminated outdoor air. (Shorter duration releases.) It was found that for buildings of .5 changes per hour, the maximum concentration after 7.2 minutes was only 2% of what was outdoors; at 1.2 hours it is only 13%; and at 12 hours, it is still only 50%.

Even though 95% of the indoor air will be contaminated in 3 hours, the concentrations are well below 50% of what they would be outdoors. For releases of relatively low concentrations, in place protection provides a viable alternative to evacuation.

While this analysis is based on normal house air infiltration rates, it is possible to significantly increase the stay time by improvising a sealed room in the house. Sealing a room by covering window and door cracks land other openings with duct or masking tape and plastic sheets will minimize outdoor air infiltration and trap a good supply of clean air in the room.

Using studies done for civil defense shelters, we find that one person could safely stay for 20 hours in a closed shelter having a net volume of 500 cubic feet (size of a large bathroom).

Similarly, 3 persons (typical household) could stay for 19.2 hours in a typical small living room or bedroom that was sealed. (The MERCK Manual shows that the range of air requirement per person is 5 liters per minute while at rest and 100 liters per minute if active).

Using 20 liters per person as an example, 3 persons with some movement in the same room as above would require 60 liters per minute resulting in a maximum stay of 11. 3 hours.

It is important to realize that it is unlikely that you would be asked to SIP for an extended period of time. However, SIP remains the favored option for protective actions in the event of a chemical incident. If there is a higher exposure trying to evacuate outdoors than there will be by remaining indoors, SIP is the action to choose.

This is independent of the type of material being released and depends only on the warning time, the duration of the release, and the infiltration rate of the building.

Enhance Your "Safe Haven"

When a SIP is called, take the following steps:

- Stay inside house or building, or go inside immediately.
- Close windows and doors
- Turn off air conditioners and heating blowers
- Close fireplace dampers
- Go to the area of the house opposite the wind direction and seal cracks and openings to provide extra protection
- Wet towels to use for protective breathing

When doing your pre-emergency planning for your family, you should identify several rooms that can be used as your "Safe Haven". (Consider rooms with *fewer,* smaller windows, one door, etc.) Assemble your SIP Kit (pre-emergency) with the items you will need to enhance your safety. Items that should be included in your SIP Kit are:

- Flashlight, with extra batteries
- AM Radio
- Scissors or knife (Swiss Army Knife or other pocket type knife)
- Small first aid kit
- Roll of duct tape or masking tape (3 to 4 inches wide)
- Roll of heavy gauge plastic or package of large plastic bags (leaf & garden size)
- One towel for each possible occupant of your Safe Haven

Optional items for you to consider:

- Medicine
- Snack Food
- Water

How to Use Your SIP Kit

- Cut lengths of plastic to more than cover your doors, windows, air vents, and electrical outlet covers. Tape in place with duct or masking tape.

- Make sure your radio or television is turned on. Have your radio tuned to an emergency station.

- If you have a fan in your house, you may wish to move it to your Safe Haven to give some air circulation within the closed up room

- If you respiratory problems, or, as time extends into the SIP you begin to smell "something" in your Safe Haven, use wet towels held over your nose and mouth to filter the air. (Paper breathing masks only stop particulate, not a vapor and will be of little use to you.)

When the "All Clear" Is Sounded

You should remove the plastic from your doors and windows and turn on your air conditioner. Open all your doors and windows and, if possible, go outside and allow your house to "air out". This is a precautionary measure to ensure that any air contaminated by the hazardous materials release is allowed to disperse.

When you re-enter your home, change the air conditioning filter (an added measure of protection), put all the items for your SIP Kit back in its container and store where it will be accessible should you have to SIP again.

When Shelter-in- Place Worked

Marathon, Hydrofluoric Acid, HF, October 30, 1987. (Texas City, Texas) 3000 evacuated - 500 treated for bums and respiratory problems - No one who elected to safe haven received any chemical-related problem following the release.

Additionally, home inspections strongly supported the fact that animals and vegetation received no ill effects when left within homes that were evacuated.

Texas City Fire Marshal Ken Jones says SIP "is always the first step." He said "the last thing you need is people running around the area." Jones said "people knew there was an accident.

But they didn't see smoke or hear an explosion, so they went out in their yards and were exposed to the cloud." *Quoted from an interview 12/16/98 with Texas City Fire Marshal Ken Jones.*

Richmond, CA, Contra Costa County, northeast San Francisco Bay - July 26, 1993. A rail car of oleum overheated and ruptured, sending a fog-like cloud of sulfur trioxide into air. 22,000 people sought medical attention. 22 were hospitalized.

"Employees of Chevron chemical plant, however, just 3000 feet away and directly in the line of the cloud, sheltered in place for the duration of the incident and no one sought medical assistance," reports Tracy Hein-Silva of the Health Services Department.

She states that SIP "has been the 'protective action of choice' during several incidents and has been proven effective," and concludes it will "always be the initial call during a hazardous materials incident in Contra Costa County."

Quoting Tracy Hein-Silva, Health Services Department of Contra Costa County, member of local CAER group and other response organizations. Paper presented to National Institute for Chemical Studies September 1995 conference.

Pensacola,.Florida, November 9, 1977 - Derailment and puncture of anhydrous ammonia tank cars on Louisville and Nashville RR Co. line. Two deaths, 46 injured, but in six houses close to accident site there was no time to evacuate ... In those homes, "rescue personnel indicate that a breathable and survivable atmosphere.. was maintained.

This was most like due to the resident securing the interiors of their homes by closing doors and windows and stuffing towels in openings under doors and around windows." *Reported in NTSB report #NTSB-RAR-78-4, page 17.*

Miamisburg, Ohio - July 8, 1986. A CSX rail tank car derailed, releasing liquid phosphorous. As a reporter at the scene put it, "practically the whole town had to evacuate."

In total, some 30,000 people in Miamisburg and nearby townships evacuated. However, patients and staff at the local hospital sheltered successfully, with no ill effects. *From telephone interview 12/15/97 with Lieutenant Andy Harp of the Miamisburg Fire Department. LL Harp was one of the first responders on the scene.*

Henderson, Nevada, May 6, 1991. Corrosion failure in steel piping system, 70 tons of chlorine liquefied gas were released. 200 were admitted to hospital, no fatalities. J. Gordon Routley, writing for the U. S. Fire Administration, concluded that those who "evacuated were exposed to greater risk than those that remained indoors (in-place protection)."

Cited in Warning, Evacuation & In-Place Protection Handbook, Emergency Management Division, Michigan State Police" and reprinted in NICS Proceedings. Paper presented by Diane L. Ogden of Michigan State Police.

Ludington, Michigan, February 7, 1993. Pipe failure, bromine cloud released. "In place protection proved to be an effective action for the population over 3 hours, rather than risking exposure of the population to the cloud during an ordered evacuation."

Presentation by Diane Ogden, Michigan State Police, in Protecting the Public: A Conference on Protective Actions During Chemical Emergencies, 1995, National Institute for Chemical Studies.

South Africa, Potchefstroom (reported in Bralsh Institution of Engineers) "While people who left their homes 180 to 200 meters from the release perished, workers taking refuge in a building 80 meters away survived.."

Houston, Texas, May 11, 1976. A Transport Company of Texas tractor-semitrailer tank truck transporting 7,509 gallons of anhydrous ammonia struck and penetrated a bridge rail on a ramp connecting 1-610 with the Southwest Freeway (US 59) in Houston, Texas.

The truck left the ramp, struck a bridge support column of an adjacent overpass, and fell onto the Southwest Freeway, approximately 15 feet below. The truck breached immediately on impact releasing most of its contents into the atmosphere. At the time of the accident there were about 500 persons within 1/4 mile of the release.

The released ammonia immediately vaporized and the 7 mph wind gradually decreased the vapor concentration at ground level.

After five minutes most of the liquefied ammonia had boiled off and the vapor cloud was completely dispersed. 78 of the 178 victims, who were within 1000 feet of the release point were hospitalized and treated for symptoms of ammonia inhalation.

Over 100 persons were treated for lesser injuries. Five of six fatalities were due to ammonia exposure.

A detailed investigation of this incident conducted by the U.S. National Transportation Safety Board in 1979 revealed that there were significant differences in the degree of injury among the exposed victims *who* evacuated buildings and those who protected in place.

The board's conclusion was that the protection offered survivors by the vehicles and buildings demonstrated that there were alternatives to simply running away from the released hazardous materials. A detailed investigation conducted by the Board showed that people who sheltered and remained inside buildings received no harm from the ammonia.

Also, people who remained inside of their automobiles generally received less severe injuries than those who left their cars and tried to escape the ammonia.

Research/Reference Material on In Place Protection (Shelter-In-Place)

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EPA Has a Role in Counter - Terrorism Activities

"We cannot afford to wait for an incident involving weapons of mass destruction. We cannot afford to be unprepared at any level."
— Former Senator Sam Nunn

Prior Incidents Involving Weapons of Mass Destruction

- 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 released intentionally in the subway in Tokyo, Japan, 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; over 160 people were killed, many hundreds were injured, and millions of dollars in property losses to the government and local businesses were sustained.

EPA is preparing for and will respond to terrorist threats from 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 role in protecting human health and the environment from possible harmful effects of certain chemical, biological, and nuclear materials, EPA is involved in counter-terrorism planning and response efforts.

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, are included in the box that accompanies this article.

The U.S. government has responded to the threat from terrorism 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 Departments of Defense and Energy, FBI, FEMA, and Public Health Service.

Why is EPA Involved ?

Under EPCRA, Clean Water Act as amended by the Oil Pollution Act of 1990 (OPA), Safe Drinking Water Act, and 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 substances might be, or has been, released in a terrorist incident; and

- after an incident, assisting with environmental monitoring, decontamination efforts and long-term site clean-up operations.

EPA's Role:

EPA has specific roles to play in supporting the federal counter-terrorism program.

Helping state and local responders to plan for emergencies.

Since 1985, 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 % of all LEPCs will have incorporated planning and response to deliberate releases by terrorists in their emergency plans.

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 civil 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.

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 such emergencies as those that might result from a terrorist incident.

EPA assists federal agencies and state and local governments through a variety of resources, including on-scene coordinators (OSCs), the Environmental Response Team (ERT), other emergency response personnel, the National Enforcement Investigations Center, and various radiological response capabilities.

Need More Information ?

For more information on EPA's counter-terrorism activities and other emergency planning regulations, visit EPA's home page at www.epa.gov/ceppo, or the NRT home page at www.nrt.org.

Everyone Has a General Duty to Operate Safely

Public awareness of the danger from releases of hazardous substances has increased over the years as serious chemicals accidents have occurred around the world.

In 1990, Congress passed landmark legislation, which recognized that preventing chemical accidents is preferable to responding to them.

The Responsibilities

Section 112(r) of the Clean Air Act Amendments requires that owners and operators of stationary sources that produce, process, handle, or store extremely hazardous substances identify the hazards associated with accidental releases and operate a safe facility.

The general duty clause, found in section 112(r)(1), has been in effect and enforceable since the air act was amended in November 1990.

A broad interpretation of the clause indicates that whenever an extremely hazardous substance is present at a facility, the owners and operators of that facility must:

- identify hazards which might result from accidental releases;
- design and maintain a safe facility, taking such steps as are necessary to prevent releases; and
- minimize the consequences of releases that do occur.

By including the general duty clause in the legislation, Congress gave owners and operators of facilities the duty to prevent accidents. While the CAA gave EPA the authority to implement and enforce the clause, the law does not require EPA to write rules clarifying it.

The Objective

EPA's objective is to reduce or eliminate accidental chemical releases. The general duty clause gives EPA another tool to accomplish this goal.

The thrust of the general duty clause is to take a proactive approach to halt accidents and to have facilities improve their prevention programs before they have an accidental release.

The chemical industry presents three scenarios that might warrant different degrees of EPA involvement under the general duty clause.

First, some facilities might benefit from such programs as the Chemical Safety Audits to voluntarily improve their prevention programs.

Second, other facilities might require stronger action through compliance inspections and enforcement to improve their prevention programs.

For example, on March 27, 1998, EPA Region III ordered United Chemical Technologies in Bristol Township, Pennsylvania, to address certain hazardous conditions that were found when the facility was inspected.

By the time the order was signed, the facility was already correcting the situation.

Still, other facilities might have an accident and face root cause and enforcement investigations.

These investigations could lead to a more traditional enforcement approach.

All three approaches eventually will help reduce or eliminate accidental releases.

Conclusion

EPA wants facility owners and operators to recognize their responsibility to promote safe operating practices.

EPA's Chemical Emergency Preparedness and Prevention Office continues to prepare and distribute safety alerts that educate industry about the hazards posed by specific chemicals or manufacturing processes.

The alerts can be found on CEPPO's web site at: www.epa.gov/ceppo

Methamphetamine Production Through Clandestine Drug Labs: How EPA Is Addressing the Problem

Problem

The number of clandestine labs in the US illegally producing methamphetamine and other illicit drugs is on the rise.

Meth labs are a serious problem along the West Coast, and throughout the Midwest, although there are signs that they are becoming a problem throughout the country.

Clandestine meth labs range from crude operations to highly sophisticated facilities.

They can be set up almost anywhere and are often found in private homes, apartments, trailers, houseboats, farms, and hotel rooms.

The rise in clandestine meth labs stem from the availability of precursor chemicals and the increasing popularity, ease of manufacture, low cost, and high profits.

Whether it's the actual production process, the haphazard storage of incompatible chemicals, or the indiscriminate disposal of wastes, clandestine meth labs are known to pose adverse health effects.

These threats affect a variety of people, including law enforcement officials, firefighters, emergency responders, property owners / managers, hotel staff, neighbors, and the actual drug lab operators and their families.

Solution

The government is stepping up its efforts to address the problem of meth labs.

EPA has obtained funding from the Office of National Drug Control Policy (ONDCP) to address the human health component of the clandestine meth lab problem. EPA has formed an inter-Agency, multi-disciplinary Project Team for the purpose of:

- Gaining a better understanding of the health risks posed by clandestine meth labs;
- Promoting awareness of the hazards; and
- Improving local capabilities to respond to those hazards.

Project Team Activities

The EPA Project Team is taking several actions to address the clandestine meth lab problem, including:

- Developing training programs on First Responder Awareness, Operations, and Train-the-Trainer to assist multi-disciplinary audiences (i.e., first responders, health officials, property managers, and the general public) in recognizing and understanding the hazards posed by meth labs;

- Piloting the training programs in Kansas City and Little Rock;

- Producing videos to increase awareness of the hazards posed by meth labs for delivery to multi-disciplinary audiences and to support the training program;

- Promoting the use of EPA's Local Government Reimbursement (LGR) program to help fund local cleanup of meth labs;

- Identifying ways to enhance local response capabilities;

- Researching, analyzing, and developing methods to sample and address residual chemical contamination at meth labs;

- Attending meetings and conferences to promote awareness of the hazards posed by clandestine meth labs and what EPA is doing to address the hazards; and

- Coordinating with ONDCP to obtain resources to continue to address the human health component of the meth lab problem through FY99.

Working with Indian Nations – A Primer
Lloyd Jackson, Confederated Salish and Kootenai Tribes

Fred Cowie, Montana DES, Liaison to Indian Nations for Emergency Management

We would like to take you on a tour of Indian country, with an emphasis on emergency management and hazardous materials response in rural and reservation areas.

What we say is not theory, it has been learned from practice in the field, in the trenches.

We hope what we have to say brings you to a closer understanding of what is possible and what can be achieved to bring about win-win situations in Indian Country.

"Training and respect," Lloyd tells groups ranging from the National Congress of American Indians to the National Tribal Conference on Environmental Management, "you have to respect the different agencies' roles, responsibilities, and jurisdictions, any you have to get them all together and train them as a team, over and over."

We deal with groups which cover the entire spectrum from volunteer fire departments to paid hazmat teams, tribal police to sheriff's offices, private ambulance companies to state emergency management personnel.

All have different agendas, different duties, different jurisdictional authorities.

But hazardous materials and floods know no boundaries. Chemical plumes don't care about jurisdictional issues.

We have to look toward life safety and environmental safety issues and work together as a team at the time of incidents.

To make that happen, we have to learn and train and exercise together. We must align our short term tasks with our mid term objectives and our long term goals.

"When you train them," adds Fred, "train them on real stuff. Volunteers and even paid rural responders have too much stuff to do, we can't make them do things just to make some regulator happy."

The way we make sure that they come to the training is have them develop their own list of local chemicals: gasoline, diesel, propane, chlorine, pesticides, acids, natural gas, etc.

They prioritize their most likely highway accident zones.

They themselves analyze at-risk facilities.

They design their own exercises, step by step, line item by line item.

No one ever says, “That doesn’t make sense” at an exercise, because the field people control everything.

“No good exercise was ever designed in a swivel chair,” smiles Fred, paraphrasing General Patton.

“And don’t get into fights.” Lloyd and Fred chime in together, “don’t let old wars disrupt today’s teamwork.” We have to play win-win, even with old, traditional adversaries. Sometimes a tribe’s suing a state in federal court.

Sometimes there is a problem with one company of industry.

Often there are jurisdictional issues.

“But be proactive,” they both agree, “address the issues early and often. Don’t let an incident be the site of a jurisdictional dispute.”

Nothing is worse that indecision, with no one willing to step up to the proverbial plate.

“We have to be able to put a pin in the map during an exercise, with a simulated release of a realistic chemical at a probable site, and be able to say: ‘Who is the lead fire, law, EMS, public health and public works?’

And get real answers, not pooled whining.”

Chemical releases in rural areas and in Indian country are not chemical problems, they are community problems.

We can always hire technicians to handle the chemicals, but we as a team have to be the solution to the community problems.

EPCRA Points to Remember

The federal EPCRA requires the development of community management plans for emergencies involving hazardous substances, and it serves as a source of information on routine toxic emissions.

The law is flexible, allowing state and local governments to devise plans specific to the needs of individual locales.

Who benefits from hazardous materials planning and reporting?

The benefits of compliance with EPCRA extend from businesses to the community.

EPCRA planning and the reporting on which it is based reflect good business sense while protecting public welfare.

Accurate reporting on hazardous substances used, produced, or stored facilitates the protection of employees, property, and investment.

Personnel who lack information on the presence of hazardous substances during a fire may elect to simply let the fire burn, perhaps resulting in unnecessary damage to inventory and property.

Compliance serves to improve business relations within the community, whereas evasiveness serves only to accentuate fears concerning potential impact on human health.

EPCRA benefits personnel in a chemical spill or fire situation. Prior knowledge of chemical types and storage locations equips emergency responders to reduce their own – and others' – exposure.

Concern for the welfare of neighboring hazardous materials storage areas also is demonstrated by compliance with EPCRA.

Adjacent property owners have a large stake in hazardous materials reporting, and owners of facilities storing hazardous materials need to respect that interest.

Community Right-to-Know

- The Emergency Planning and Community Right-to-Know Act provides local governments and communities at large with information on hazardous chemicals used, stored, or released in their area.

- The responsibility for EPCRA compliance is a joint endeavor among federal, state, and local governmental agencies, and those businesses, facilities, and farms producing, storing, and using hazardous and extremely hazardous substances.

- EPCRA contains numerous requirements for emergency planning and dissemination of information.

- The objective of EPCRA is to improve local emergency response capabilities, primarily through improved emergency planning and notification, and to provide citizens and local governments access to information about EHS chemicals.

Emergency Personnel's Right-to-Know

- EPCRA specifies procedures within communities for the development and implementation of response plans, calling for anticipation of emergency situations and establishment of a plan of operation for those assigned the responsibility of handling emergencies involving EHS and CERCLA chemicals.

- The sharing of information among LEPC members and those who respond to local emergencies leads to a better coordinated team effort to reduce risk to the community while simultaneously protecting the health and well-being of those whose purpose it is to provide assistance during emergency situations.

- Businesses should invite local response organizations – emergency management agencies, fire departments, emergency medical services, and planning committees – to tour their facilities to become acquainted with the layout.

- Additionally, facilities should invite local planners and responders to participate in any facility drills or exercises that are held.

LEPC Letter from Jim Makris, Director, CEPPO, EPA

In response to the recent E-mails on the roles of LEPCs and the risk management program, EPA would like to comment.

We appreciate all those whose comments brought this issue to our attention. EPA believes that chemical hazards are primarily a local concern.

When a chemical is accidentally released, it is facility workers, local firefighters and other responders, and citizens living nearby whose lives and health are potentially at risk.

Of course, the other side of this coin is that it is workers and citizens who benefit economically from having the facility located in their community.

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA, also known as SARA Title III) set up local emergency planning committees (LEPCs) to deal with emergency planning and provide information about chemical hazards in the community.

EPCRA required that LEPCs have a broad-based membership (including, at a minimum, representatives from elected State and local officials; law enforcement, civil defense, firefighting, first aid, health, local environmental, hospital, and transportation personnel; broadcast and print media; community groups; and facility owners and operators).

LEPCs can (and should) include representation from local EMAs.

One task is to develop a response plan. (A few States require LEPCs to develop a contingency plan for each facility in the planning district; this goes beyond, without replacing, the EPCRA requirement for one community plan.)

EPA has consistently noted the advantages associated with such a broad-based LEPC membership: all people involved in understanding, preventing, and responding to releases should be involved in developing a plan.

In addition to this planning requirement, EPCRA also gave LEPCs community right-to-know responsibilities.

Specifically, LEPCs are to receive information (MSDSs, a list of MSDSs, and Tier I or II inventory forms) about OSHA hazardous chemicals in the community.

There are several hundred thousand OSHA hazardous chemicals.

LEPCs are to designate a coordinator for information and set up procedures for responding to public requests for information about chemical hazards in the community.

Many LEPCs have developed the capability to manage information electronically.

Finally, the plans prepared by LEPCs designate an emergency coordinator who is to be notified when accidental releases occur in the community.

EPA recognizes the great variety among LEPCs throughout the country.

Some are more active, some less active.

Some have more members than others. In many cases, it is the energy and commitment of one person that makes an LEPC effective.

Granted this variety, EPA notes that it is not accurate to say that the LEPCs' only requirement under EPCRA is to prepare a plan for specific facilities.

EPA believes that information available in risk management plans (RMPs) prepared under the accident prevention provisions of Clean Air Act §112(r) will prove helpful to LEPCs and other agencies (e.g., EMAs) at the local level.

In fact, the primary purpose of CAA §112(r) is to prevent accidental chemical releases and reduce their severity.

CAA goes beyond the planning for responses that was emphasized in EPCRA.

The best way to minimize threats to human health and the environment from accidental chemical releases is to prevent releases from occurring.

RMPs will include a description of potential offsite consequences related to a release under a worst-case scenario and alternate scenarios for the covered chemical(s) at a facility.

LEPCs and other local agencies will also find in RMPs a description of accidental releases during the previous five years.

And RMPs will include a summary of the response program at a facility, both internal preparations and existing agreements with LEPCs and other groups in the community.

This information about hazards assessment and the response program should prove helpful to local officials, planners, and responders, as they try to understand hazards and develop plans.

The RMP also describes the accident prevention program at a facility.

Recognizing that CAA §112(r) and its regulations do not impose any requirements on LEPCs and other local government organizations, EPA nevertheless is convinced that LEPCs and local citizens will find this accident prevention information helpful in their efforts to protect human health and safety.

It will ensure LEPCs have the current data on risk in the community and will keep planning for response and risk reduction relevant.

It will help to show cooperation between government and industry and may overcome attitudes of "gotcha" and encourage attitudes of "we are all in this together."

It may also enhance the SERC/LEPC structure.

EPA will continue to do what it can to ensure that LEPCs and other local organizations know about RMPs and their potential usefulness at the local level, and to make specific RMPs available to LEPCs and other similar local organizations.

EPA would like to work with local EMAs and other State and local agencies on RMP implementation.

We welcome your suggestions on how to build a stronger we partnership.

James (Jim) L. Makris, Director – CEPPO

New LEPC Survey Results

In March, 1997, George Washington University's Public Adm. Department conducted nationwide telephone interviews with 1,018 LEPCs.

Highlights of the findings may be summarized as follows:

- Compared to a 1994 survey, the 1997 survey detects only a modest increase in the number of LEPCs that use computers to manage their facility chemical inventory data -- from 35 % to 39 %.

- The 1997 findings reveal that a large proportion of LEPCs (42 %) are on the verge of switching from paper filing to computer systems for data management. (Just 18 % contend that they do not need or cannot afford to shift to computers).

- Computerization is planned throughout all regions of the U.S. -- and among virtually all but the least active and nonfunctioning LEPCs. If these plans are fulfilled, computer use for data will more than double from 39 % to 81 % of all LEPCs.

  Even if some of these plans are delayed, LEPCs are likely to undergo a radical shift in their data management practices during the 1997-1999 period. This is a pivotal time when support and assistance is likely to be particularly important for these later adaptors.

- LEPC leaders consider the facility chemical inventory data to be "very useful" (44 %) or "moderately useful" (43 %).

  They use the data for emergency response planning (96 %), hazard analysis (91 %), responding to public inquiries (89 %), disseminating information to the community (85 %), and, to a lesser extent, for zoning and land-use decisions (34 %).

- CAMEO was the most liked and widely used of three software packages. LEPCs overwhelmingly use CAMEO to support key activities of emergency planning (93 %), emergency responses (92 %), and managing chemical inventory data (91 %).

  Rather than confining their use to one or two features, LEPCs find nearly all of CAMEO's key features to be useful.

- LEPCs with computer management, 76 % currently use CAMEO, 21 % use Tier II, and 8 % use LandView.

- CAMEO is considered to be "very useful" by 69 % of the LEPCs, Tier II by 57 % and LandView by 52 %.

- The Web site for CEPPO (Chemical Emergency Preparedness and Prevention Office) is considered worthwhile by those who have seen it. However, only 6 % of those with computers have viewed the site in the past six months.

Commentary on Data:

Impending Transformation: The 1994 survey found that 35 % of the LEPCs had put their data into a computerized database.

The 1997 survey suggests a modest increase, with 39 % now doing so.

However, the 1997 “snapshot” depicts LEPCs on the verge of a widespread transformation from paper to computer systems.

Only four out of every ten LEPCs (39 %) have already entered the computer era -- but another four out of tem (42 %) now have plans to join them.

Just two in ten LEPCs (18 %) contend that they do not need or cannot afford to make the shift to computers.

Uncertain Outcomes: The success of these good intentions to computerize EPCRA data is not assured.

The early adaptors are likely to have been more computer savvy and predisposed to high-tech solutions.

In contrast, these late adaptors may find the attempted shift to computers significantly more difficult.

Indeed, one dramatic finding from the GWU survey of listed users of CAMEO, Tier II, and LandView (Feb. 1997) is that there are so many would-be-users who -- for a variety of reasons -- never actually used the software.

The next few years appear to be a crucial time for a potential revolution in LEPC data management.

Many hundreds of LEPCs around the country are going to try to replace their paper filing with a computer system.

Whatever timetable EPA envisions for promoting, training, and assisting LEPCs in this endeavor, the survey results are unambiguous:

The ideal time is now.

Satisfactory Software: Most LEPCs are pleased with the software they are using.

CAMEO users are especially happy with its features and overall utility.

LEPCs that use CAMEO are overwhelmingly employing the software to support the key LEPC activities of emergency planning, emergency response, and managing chemical inventory data.

LandView and Tier II are newer programs that are not quite as popular as CAMEO and have far fewer LEPC users.

Yet, most of those who use those programs consider them worthwhile.

(With a few minor exceptions, LEPC users tended to mirror the opinions of other users of these three programs as found in the other recent GWU user surveys).

The best evidence is that, for most LEPCs, the software itself is not a major impediment to their computerizing EPCRA data.

Web-based Communications: CEPPO's Web Site has attracted little LEPC interest.

While it garners good reviews from those who have seen it, very few (only 6 % of those with computers) have made the effort to see in the past six months.

Absent a major promotion, this is not yet an effective channel for CEPPO communication with LEPCs.

Lead-acid Batteries in Buildings
by Robert Taylor

Lead-acid batteries are used in buildings throughout the nation to provide power for work vehicles and other electrical/electronic applications.

For example:

- battery-powered fork-lifts are used in warehouses; data processing equipment with batteries are in industrial and business related facilities ;
- telecommunications facilities use great numbers of emergency standby battery systems to maintain service during commercial power outages;
- electrical utilities also use many battery systems in their power generation and distribution networks.

Because of their ubiquity, reliability and low-maintenance, these battery systems are often overlooked when addressing hazardous materials in the workplace.

It has been estimated that there are well over 100,000,000 gallons of sulfuric battery acid and 100,000 tons of battery lead in “business” classified buildings throughout the United States.

Sulfuric acid is the highest volume chemical produced in the world.

It is used in more chemical reactions and industrial processes than any other chemical.

Sulfuric acid is not flammable by itself, but it can cause and support a fire by reacting with other chemicals and liberating enough heat to ignite ordinary combustibles.

Sulfuric acid can also support a fire by releasing oxygen from the sulfate ion and therefore feed oxygen to the flames.

The sulfuric acid will dissolve many metals, releasing hydrogen which is extremely flammable.

Heat generated during this chemical reaction can ignite the hydrogen, creating an explosive environment.

Sulfuric acid is extremely dangerous when it contacts oxidizers and organic materials.

This acid, in high concentrations, is also a major hazard to human life.

When sulfuric acid comes in contact with flesh, it withdraws water, leaving a black charred carbon residue, in the place of living tissue.

The higher the concentration, the greater the danger.

If sulfuric acid comes in contact with large areas of human tissue, death can occur.

If acid fumes are inhaled, serious lung and bronchial damage can occur.

As an example of a hazardous release of battery acid in a building, the following is quoted from the NFPA fire investigation report of the Los Angeles Grand Telephone Exchange fire of March 15, 1994:

“One of the threats was sulfuric acid (28 percent solution, similar to a car battery) that had been released from damaged batteries.

‘The batteries were not in diked areas so the leaking acid formed pools covering the floor near the batteries.

‘Since typical protective gear for structural fire fighters is not effective against acids, injury could have resulted had fire fighters been crawling as they approached the fire or slipped and fallen while walking through the acid pool.”

Since the Uniform Fire Code is used in most of EPA Region 6, and since most fire departments employ the Uniform Fire Code (UFC) as a Hazardous Materials Management Plan, the following scenario is offered for consideration:

- Many medium and large Group B Occupancy Facilities contain lead-acid batteries with a total liquid capacity exceeding UFC Health and Physical Hazard Maximum Quantities per Control Area.

- There is little industry awareness that batteries contain hazardous materials including sulfuric acid and lead compounds.

- Lead-acid batteries are seldom listed on the Hazardous Materials Inventory Statement (HMIS).

- Since lead-acid batteries are generally not found on the HMIS, there is no lead-acid battery system Hazardous Materials Management Plan (HMMP).

- Since there is no lead-acid battery HMMP, employee awareness and related hazardous materials training and materials are not in place.

- Since there is no HMMP on file, fire departments may not be fully aware or prepared in the event of a fire or emergency in one of these facilities (LA Grand Fire - 1994).

- 1995 Uniform Fire Code Article 64 awareness or use as an Alternate Method to adopted law Article 80 provisions appears to be minimal.

- Implementation of the UFC Article 64 offers a facility a way of compliance not only with the fire code, but also with the intent of Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) requirements.

  The potential for harm to people, equipment, and the environment can be decreased without much effort or resources.

Conclusion: Before the LEPCs and other authorities having jurisdiction can plan and train for hazardous materials in buildings, they must be aware of their presence and the associated hazards and magnitude of these materials.

While EPCRA Sections 302, 311, and 312 require reporting of extremely hazardous substances and hazardous materials over a prescribed threshold limit, many owners/operators appear to be unaware that they even have batteries and these batteries in their facilities contain hazardous materials and are subject to reporting.

LEPC’s may want to consider some form of awareness program including auditing their Tier II reports where sulfuric acid is not reported and yet it is believed there may be batteries installed.