

Environmental Health Technical Brief

Hazards to Communities from Chemical Handling and Storage in Workplaces

Environmental & Occupational Health Assessment Program

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On April 17, 2013, an explosion occurred at the West Fertilizer Company storage and distribution facility in West, TX. At least 15 people were killed, more than 160 people were injured, and more than 150 buildings were damaged or destroyed at the facility and in the surrounding community. This disaster was just the most recent event to point out the inadequacy of federal regulatory oversight of chemical storage safety in populated areas, in this case 240 tons of ammonium nitrate and 50 tons of anhydrous ammonia.



Aerial photo of the west explosion site taken several days after blast (4/22/2013).
Photo credit: Shane Torgerson

Explosions and accidental chemical releases at workplaces in Connecticut, though on a much smaller scale than what was seen in West, TX, have highlighted similar vulnerabilities at industrial facilities located within or near residential areas.

- In 2010, an explosion at the Kleen Energy natural gas power plant under construction in Middletown, CT killed six workers, injured at least 50, and caused millions of dollars in damage to buildings in the surrounding communities.
- In 2008, chlorine gas leaked from a tanker being off-loaded at a facility in New Haven, CT causing 15 people to be transported to local hospitals and a nursing home nearby to be evacuated.
- In 2007, workers improperly cleaning a cyanide spill at a facility in Berlin, CT were transported to a local emergency room prior to complete decontamination, which resulted in a temporary shutdown of the contaminated emergency room and potential exposure of the public to dangerous cyanide vapors.

Chemical Incident Prevention Tools for Local Health

Connecticut State Law provides specific authority to municipalities to “regulate and prohibit the carrying on within the municipality of any trade, manufacture, business or profession which is, or may be, so carried on as to become prejudicial to public health... to those living or owning property in the vicinity” [CGS § 7-148(c)(7)].

Regulations promulgated by Federal agencies can be used by local health departments and other local agencies to determine the types and levels of risk posed by workplaces that manufacture and/or store chemicals in their communities. Two of these standards of particular interest to local health agencies are:

- The Environmental Protection Agency’s (EPA) Emergency Planning and Community Right-To-Know Act (EPCRA), also referred to as SARA Title III, and
- The Occupational Safety and Health Administration’s (OSHA) Process Safety Management (PSM) standard for highly hazardous chemicals

These standards are designed to prevent accidental chemical releases and minimize threats to the surrounding community in the event of industrial accidents or fires at facilities that manufacture, use, or store significant quantities of hazardous chemicals. Their provisions can be used by local health departments, in the context of existing municipal powers in the state, to reduce the risk of catastrophic chemical release events.

Emergency Planning and Community Right-to-Know (EPCRA)

The Superfund Amendments and Reauthorization Act (SARA) of 1986 created the Emergency Planning and Community Right-to-Know Act (EPCRA) to help communities plan for emergencies involving hazardous substances. The Act 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. There are four major provisions of EPCRA:

Emergency Response Plans (Sections 301-303)

Emergency Response plans contain information that community officials can use at the time of a chemical accident. The plans must include all of the components listed in the provision of the Act and Local Emergency Planning Committees (LEPCs) are required to update these plans annually. LEPC planning activities focus on 355 listed chemicals above threshold planning quantities (minimum limits). Any facility that has these chemicals at or above its threshold planning quantity must notify the State Emergency Response Commission (SERC) and LEPC within 60 days after they first receive a shipment or produce the substance on site.

Emergency Notification (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 355 extremely hazardous substances, as well as the more than 700 hazardous substances subject to the emergency notification requirements under Superfund. Initial notification can be made by telephone, radio, or in person. A written follow-up notice that updates information included in the initial notice and provides information on actual response actions taken and advice regarding medical attention necessary for citizens exposed, must be submitted to the SERC and LEPC as soon as practicable after the release.

Community Right-to-Know (Sections 311 and 312)

Facilities that hold chemicals above certain threshold quantities must submit either copies of their Safety Data Sheets (SDSs) or a list of these chemicals to the SERC, 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 (acute/chronic health hazard, fire hazard, sudden release of pressure hazard, and/or reactive hazard). Facilities must submit annually a Tier I or Tier II Emergency and Hazardous Chemical Inventory Form to the LEPC, the SERC, and the local fire department.

Toxics Release Inventory (Section 313)

The Toxics Release Inventory (TRI) tracks the management of certain toxic chemicals that pose a threat to human health and the environment. Facilities 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 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.



Photo credit: US EPA

What Are SERCs and LEPCs?

The Governor of each state designates a State Emergency Response Commission (SERC). The SERC, in turn, designates local emergency planning districts and appoints 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.

In addition to the recordkeeping and reporting requirements detailed in EPCRA, in the event of certain chemical releases or industrial accidents requiring significant emergency response, local jurisdictions may apply for federal funds (up to \$25,000) to offset some of the costs of emergency response to those incidents (40 CFR Part 310).

More information about EPCRA, its provisions, and the role of local agencies can be found on the EPA website at <http://www.epa.gov/oem/content/epcra>.

Process Safety Management (PSM) for Highly Hazardous Chemicals

Section 304 of the Clean Air Act Amendments (CAAA) requires that the Secretary of Labor, in coordination with the EPA Administrator, promulgate a chemical process safety standard to prevent accidental releases of chemicals that could pose a threat to employees and the surrounding community. The CAAA requires that the standard include a list of highly hazardous chemicals which includes toxic, flammable, highly reactive, and explosive substances.

To understand PSM and its requirements, local agencies need to understand how OSHA uses the term “process” in PSM. Process means any activity involving a highly hazardous chemical including using, storing, manufacturing, handling, or moving such chemicals at the site, or any combination of these activities. For purposes of this definition, any group of vessels that are interconnected, and separate vessels located in a way that could involve a highly hazardous chemical in a potential release, are considered a single process.

The PSM Standard applies to those companies that deal with any of more than 130 specific toxic and reactive chemicals in specified quantities. It also includes flammable liquids and gases in quantities of 10,000 pounds (4,535.9 Kg) or more.

Photo right: The Kleen Energy natural gas electric generating plant before (top) and after (bottom) an explosion that killed six workers, injured 50 others, and caused extensive damage to the facility and the surrounding community.

Credit: US Chemical Safety and Hazard Investigation Board.



What is Process Hazard Analysis?

The key provision of PSM is process hazard analysis (PHA) - a careful review of what could go wrong and what safeguards must be implemented to prevent releases of hazardous chemicals. Employers must perform an initial process hazard analysis (hazard evaluation) on all processes covered by this standard. The process hazard analysis methodology selected must be appropriate to the complexity of the process and must identify, evaluate, and control the hazards involved in the process. All process hazard analyses must be updated and revalidated at least every five years.

The PSM Standard requires several written documents to be developed and kept on-site in facilities. These documents should be made available to local health and safety officials in the community upon request.

- Written safety information identifying workplace chemical and process hazards, equipment used in the processes, and technology used in the processes;
- Workplace hazard assessments, including identification of potential sources of accidental releases, identification of any previous release within the facility that had a potential for catastrophic consequences in the workplace, estimation of workplace effects of a range of releases, and estimation of the health and safety effects of such a range;
- Written operating procedures for the chemical processes, including procedures for each operating phase, operating limitations, and safety and health considerations;
- Written safety and operating information for employees and employee training in operating procedures, by emphasizing hazards and safe practices that must be developed and made available;
- Records of comprehensive and effective training for employees and contractors in emergency response procedures;
- Maintenance systems for critical process-related equipment, including written procedures, employee training, appropriate inspections, and testing of such equipment to ensure ongoing mechanical integrity;
- Pre-startup safety review procedures of all newly installed or modified equipment;
- Written procedures managing change to process chemicals, technology, equipment and facilities;
- Records of investigations of every incident that results in or could have resulted in a major accident in the workplace, with any findings to be reviewed by operating personnel and modifications made

Chemical Incident Prevention and Response: Roles for Local Health

The majority of the active role of local health departments related to accidental chemical releases occurs in the prevention stage prior to an incident and the investigation of incidents during the recovery stage. Potential activities for local health responders include:

<i>Before an incident:</i>	<i>During an incident:</i>	<i>After an incident:</i>
<ul style="list-style-type: none"> • Maintain a strong presence on your area's LEPC • Visit the US EPA Toxics Release Inventory (TRI) website to identify SARA Tier II covered facilities in your area • Work with local fire departments, CT DEEP, and CT DPH to develop and inventory of at-risk sites and assess risk • Perform audits of at-risk workplaces in conjunction with local fire to review their written safety procedure, training records, and emergency action plans 	<ul style="list-style-type: none"> • Report chemical spills or other environmental incidents to CT DEEP at 866-DEP-SPIL • Offer assistance and support as part of the Incident Command System • Prepare specific talking points and make a representative available for calls from the public, the press, or other local/state/federal officials • Work with the CT DPH Environmental and Occupational Health Assessment program staff to determine appropriate exposure control protocols and to quantify short-term health risk for site responders and community members 	<ul style="list-style-type: none"> • Maintain an available representative for follow-up calls from the public, the press, and officials • Communicate with the CT DPH Environmental and Occupational Health Assessment program staff to determine appropriate clean-up levels and to quantify any longer-term health risk for site responders and community members • Participate actively in the local investigation of the incident, including any emergency planning deficiencies at the facility • Obtain contact information for potentially exposed individuals for follow-up

RESOURCES AND REFERENCES

US EPA: Emergency Planning and Community Right-To-Know Act (EPCRA) [SARA Title III]
<http://www.epa.gov/oem/content/epcra/>

Toxics Release Inventory Website
<http://www2.epa.gov/toxics-release-inventory-tri-program>

OSHA: Process Safety Management (PSM) Standard for Highly Hazardous Chemicals
<https://www.osha.gov/SLTC/processsafetymanagement/>

Hazard Communication Standard Website
<https://www.osha.gov/dsg/hazcom/>

US Chemical Safety and Hazard Investigation Board
<http://www.csb.gov/>

CT DEEP: Emergency Response and Spill Prevention (866) DEP-SPIL or (860) 424-3338
<http://www.ct.gov/deep/spills>

State Emergency Response Commission (860) 424-3373
<http://www.ct.gov/serc/site/default.asp>

CT DPH: Environmental and Occupational Health Assessment Program (860) 509-7740
<http://www.ct.gov/dph/environmentalhealth>