August—October 2009 Volume 3, No. 4

United States Environmental Protection Agency, Region 4

EPCRA NEWSLETTER

INSIDE THIS ISSUE:

Visit http://www.nasttpo.com/home/ for information on the National Association of SARA Title III Program Officials (NASTTPO).

Visit http://www.census.gov/epcd/www/naics.html for more information on the North American Industry Classification System (NAICS) and how it provides new information on industries.

Envirofacts (http://www.epa.gov/enviro/index.html) allows you to search for environmental informa-

DISCLAIMER

This document may contain discussion of EPA provisions in a plain language format. Nothing in this newsletter revises or replaces any regulatory provisions cited in part from the Code of Federal Regulations, the Federal Register, or the Emergency Planning and Community Right-to-Know Act. For more information please go to: http://www.epa.gov/lawsregs/

…providing first responders and other emergency personnel with on-site hazardous chemical information for U.S. facilities

CRITICAL SECONDS

Thousands of different chemicals and hazardous materials are used commercially and transported across America everyday. When there is an accident involving a chemical plant, a warehouse, a refinery, or a transportation vehicle, the first responders assisting the plant or refinery fire brigade need critical information fast to protect themselves, possible accident victims, and surrounding communities. E-Plan is a secure, Internet accessible repository of facility and hazardous material information that does just that. The system provides critical chemical information at the scene and is in use in many communities nationwide. E-Plan was designed specifically for first responders through a cooperative agreement between the United States Environmental Protection Agency (EPA) and The University of Texas at Dallas (UT Dallas). Funding is now being provided by the United States Department of Homeland Security (DHS).

ACCIDENTS HAPPEN

They are the result of human or mechanical failures or random events that we cannot flawlessly control. In 2001, the National Response Center took nearly 34,000 calls reporting accidental oil or hazardous substance releases. During the same year, the Agency for Toxic Substances and Disease Registry (ATSDR) examined 8,978 significant hazardous substances emergency events, not including the World Trade Center disaster. Most people assume that transportation accidents are the major concern for injuries and health consequences. However, 75 percent of these events occurred at fixed facilities.

ATSDR also reported that in 2001, 1,920 people suffered health consequences from hazardous materials releases from fixed facilities such as chemical plants, refineries, and warehouses. Of the injured, 227 were first responders. Only 247 people suffered health consequences from transportation accidents, of which 47 (19 percent) were first responders.

Companies try to prepare for resulting emergencies but in many cases they cannot plan for the unusual accidents. For example, a rubber molding plant in Kingston, N.C., exploded and burned, killing three people in March 2003. Flammable solvents and hazardous materials were in the plant, but the local fire department could not find the plant's Emergency Plan. Material Safety Data Sheets (MSDS) were found in a demolished plant office but were marked "active" and "inactive," which caused much confusion for the first responders. (continued on pages 8-9)

CSB Releases Safety Video on Need for Chemical Emergency Preparedness, Based on Findings from a Decade of CSB Accident Investigations

Washington, DC, June 11, 2009 – The U.S. Chemical Safety Board (CSB) today released a new safety video showing the need for emergency response agencies, companies, and communities to work closely together to prepare for the kinds of tragic chemical accidents the CSB has investigated over the past decade.

The new video, entitled "Emergency Preparedness: Findings from CSB Accident Investigations," uses computer animations, interviews, and news footage to depict a series of chemical accidents that illustrate the need for effective training, communications, and community planning. In some incidents, firefighters and police were overcome by toxic chemicals and forced to retreat from neighborhoods; in others, firefighters and workers were tragically killed and others injured.

The video is available online at www.CSB.gov, www.safetyvideos.gov, and YouTube. It can be ordered on a new two-DVD set of all CSB safety videos by filling out the request form at www.CSB.gov.

In the video, CSB Chairman John Bresland notes, "Preparations by companies, emergency responders, government authorities, and the public are critical to reducing injuries and saving lives. It's not only important to be prepared, but everyone must communicate, have an up-to-date plan in place and practice that plan regularly. We hope that our findings will help keep communities safe."

In addition to comments by CSB investigators and board members, the video features observations by fire chiefs, a state fire marshal, and an expert on emergency preparedness and local emergency planning.

Danvers, Massachusetts, Fire Chief James P. Tutko, who led the effort to battle a massive fire and explosion at an ink plant in 2006, and oversaw the community evacuation, said he recommends "Emergency Preparedness" as well as other CSB safety videos. "I can recommend CSB safety videos for their content and accuracy. They can be used for all aspects of emergency response training," Chief Tutko said, adding, "Don't wait for an accident in your jurisdiction to learn about the CSB's findings."

The video begins with an animation of a boiling liquid expansion vapor explosion, or BLEVE, in a large propane tank that killed two firefighters and injured seven others in a 1998 accident in Albert City, Iowa. The firefighters had not received accurate training or guidance on BLEVE hazards and approached within 100 feet of the burning tank when it suddenly blew apart.

"The Herrig Brothers farm explosion animation provides a tragic but important starting point for the video," said Board Member William Wark. "Every day firefighters face challenges like these and sadly, sometimes lose their lives. We hope the video will make the case that training and communication are critical so that responders can do their jobs without death or injury."

Another propane explosion seen in the video – which destroyed a convenience store and killed two propane service technicians, a volunteer fire captain, and an EMT in Ghent, West Virginia – shows the need for training to rapidly evacuate such danger zones. West Virginia State Fire Marshal Sterling Lewis states in the video, "We take a vow to protect life and property. Life comes first." Commenting on the video's central them, Fire Marshal Lewis said, "We must train until it becomes second nature. We must educate ourselves and the public to the point we can help each other." (continued on page 9)

Chemical Emergency Preparedness Conference

On July 29-31, 2009 the US EPA Region 4 held its annual Chemical Emergency Preparedness Conference in Louisville, Kentucky. The conference was held in conjunction with the Kentucky Governor's Emergency Management Conference. Over 500 participants attended, including state and local government chemical emergency planners, emergency responders, chemical industry environmental health and safety personnel and production managers and members of the transportation industry (air, truck and rail). The theme of the conference was Prepare - Respond - Recover.

On July 29 attendees were welcomed by addresses from Brigadier General John W. Heltzel, Director of the Kentucky Division of Emergency Management, A. Stanley Meiburg, US EPA Region 4 Acting Administrator and Major General James Bassham (retired) from the Tennessee Emergency Management Agency. Following the keynote address was a roundtable of LEPC members. On July 30-31 attendees participated in sessions throughout the day. Some of the most popular sessions were

- Establishing an Effective Local Emergency Planning Committee
- Emergency Communications
- Evolution of State Emergency Response Commission and the Local Emergency Planning Committees
- Louisville Metro Emergency Operations Center in Action.

Between sessions attendees viewed the vendor hall which included information, resources and products useful for emergency preparedness.

Regulatory News

EPCRA Penalties

Maximum penalties for violation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) § 103 (40 C.F.R. Part 302.6), and the Emergency Planning and Community Right-to-Know Act (EPCRA) § 304, 312, and 313 (40 C.F.R Part 355.40, 40 C.F.R. Part 370, 40 C.F.R. Part 372, respectively) are currently $37,500 per day per violation. The new penalties became effective for reporting of the 2008 calendar year (2009 due dates), specifically all violations that occurred after January 12, 2009. Prior to this increase, the maximum penalty for these violations was $32,500 per day per violation.

As a result of Region 4 EPCRA enforcement activities, $505,889 has been collected as cash penalties year-to-date and an additional $154,015 in the form of Supplemental Environmental Projects, including some $108,316 spent on emergency planning and preparedness assistance.

On December 11, 2008 The Environmental Protection Agency (EPA) issued the final Civil Monetary Penalty Inflation Adjustment Rule, as mandated by the Debt Collection Improvement Act of 1996 (DCIA), to adjust for inflation the statutory civil monetary penalties that may be assessed for violations of EPA-administered statutes and their implementing regulations. The Agency is required to review the civil monetary penalties under the statutes it administers at least once every four years and to adjust such penalties as necessary for inflation according to a formula specified in the DCIA. The Federal Register is the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents.

For more information, please view the Federal Register notice at http://edocket.access.gpo.gov/2008/pdf/E8-29380.pdf

Happenings around the region

GEORGIA

On June 25, 2009 Augusta/Richmond County hosted a meeting of the Waste Isolation Pilot Plant (WIPP) campaign. The meeting was held at the Augusta Marriott Hotel and was attended by all 23 WIPP counties, Local Emergency Management Director Howard Willis, representatives from Columbia County Emergency Management and officials of different levels of government who are integrally involved with the program. The purpose of the conference was to provide additional information about the Georgia WIPP campaign origination from the Savannah River Site and Oak Ridge National Laboratory that traverse the state enroute to Carlsbad, New Mexico.

The Waste Isolation Pilot Plant is a Department of Energy (DOE) facility designed to safely isolate defense-related transuranic waste. Waste temporarily stored at sites around the country is shipped to WIPP and permanently disposed in rooms mined out of an ancient salt formation 2,150 feet below the surface. WIPP, which began waste disposal operations in 1999, is located 26 miles outside of Carlsbad, N.M.

Southern State Energy Board (SSEB) viewed this meeting as the opportunity to link locals, who are the front line for emergency response, security, and other preparedness activities with their state and federal counterparts. The WIPP campaign has successfully moved transuranic waste from the Savannah River Site to Carlsbad, New Mexico because of the diligence of these officials. SSEB felt this conference will enhance the safety, efficiency, and effectiveness of the program by increasing the collaboration and level of awareness between the various organizations. The initial meeting will be used as a model to develop closer relationships with the localities of the other states along the WIPP corridor.

NORTH CAROLINA

Guilford County LEPC & Triad ASSE
present
the 2009 Business and Industry Safety & Environmental Conference

Wednesday, September 30, 2009
Doors open at 7:30 am
Greensboro Coliseum Special Events Center 1921 W. Lee Street Greensboro NC

The 2009 BISE Conference is your opportunity to receive FREE training on a variety of safety, health and environmental topics and to network with professionals. The Conference will also showcase vendors who can provide services, supplies and products in the EH&S areas. The 2009 BISE Conference is designed for professionals like:

- EH&S Managers
- Safety and Health Professionals
- Environmental and Compliance/Reporting Professionals
- Industrial Hygiene Professionals
- Emergency Planning and Response
- Small and Large Business Owners

For more information and to register:
http://www.guilford-lepc.org/Conferences/2009/conference09.htm

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Would you like to submit a story and/or do
you have suggestions for the EPCRA Newsletter?
Contact Vinson Poole (404-562-9186 / poole.vinson@epa.gov).

PROCESS SAFETY CORNER

A PLACE FOR RMP RELATED NEWS: CHEMICAL SAFETY ALERT

Emergency Isolation for Hazardous Material Fluid Transfer Systems—Applications and Limitations of Excess Flow Valves

The Environmental Protection Agency (EPA) is issuing this *Alert* as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. We are striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations are also required. EPA publishes *Alerts* to increase awareness of possible hazards. It is important that facilities, State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs), emergency responders, and others review this information and consider whether additional action is needed to address the hazards.

Problem:
While excess flow valves (EFV) are in extensive service and have prevented numerous pipe or hose breaks from becoming much more serious incidents, experience has shown that in some cases the EFV did not perform as intended, usually because of misapplication. Also, undue reliance must not be placed on EFVs as the sole or primary protection to control accidental chemical releases from tanks or piping.

Excess flow valves are protective devices intended to prevent the uncontrolled release of hazardous materials from road, rail and marine transport vessels, stationary storage vessels and distribution networks. EFVs are designed to close when the flow rate through them exceeds the expected range of normal operation, for example due to a downstream leak or valving error that provides an unintended release path to the atmosphere. EFVs are intended to bring the release under control until the leaking element (e.g. hose or pipe) can be blocked in and positively isolated for corrective action.

Industry incident experience, however, has shown that under certain circumstances, EFVs can fail to provide the protection anticipated of them. In fact, a number of significant releases of hazardous materials have occurred from systems 'protected' by EFVs. One event investigated by the National Transportation Safety Board (NTSB) resulted in the deaths of three plant employees and the evacuation of 2,000 nearby residents. Concerned that undue reliance might be placed upon EFVs, the NTSB recommended in its investigation report that EPA:

> "Notify all facilities that are required to submit risk management plans to the Environmental Protection Agency that tank car excess flow valves cannot be relied upon to stop leaks that occur during tank car loading and unloading operations and that those companies that have included reliance on such valves in their risk management plans should instead identify and implement other measures that will stop the uncontrolled release of product in the event of a transfer line failure during tank car loading or unloading."

EPA shares the NTSB's concerns and additionally recognizes that the use of EFVs extends beyond tank cars and includes loading and unloading operations associated with tank trucks, marine barges, stationary tankage and piping distribution networks. This *Hazard Alert* is intended to provide an understanding of (1) how EFVs function, (2) circumstances that can lead to their failure to function as intended, (3) important design and operational factors for enhancing the reliability of EFVs, and (4) alternate means available for stopping uncontrolled releases.

Facilities should be aware of, and give proper regard to, industry best practice guidance and regulatory requirements for the use of EFVs.

When they are properly designed, installed, and maintained, EFVs play an important role in comprehensive accidental release prevention systems. It is not EPA's intent to dissuade the regulated community from the use of EFVs but, rather, to provide precautionary guidance regarding their use as a sole means of protection.

Accidents:
Provision should be included for blocking in (isolating) hazardous material transfer lines in addition to the protection provided by EFVs. As in the following incidents, failure to understand the limitations of EFVs has been a contributing factor in a number of significant incidents where flow restriction prevented EFV closure *(continued on page 10).*

Community Action for a Renewed Environment (CARE) is an USEPA competitive grant program that offers an innovative way for a community to organize and take action to reduce toxic pollution in its local environment. Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them. By providing financial and technical assistance, EPA helps CARE communities get on the path to a renewed environment.

CARE Description

- Through CARE various local organizations, including non-profits, businesses, schools and governments create partnerships that implement local solutions to reduce releases of toxic pollutants and minimize people's exposure to them.
- CARE educates and supports communities by helping them assess the pollution risks they face. We provide access to EPA's and other voluntary programs to address local environmental priorities and improve the environment through local action.
- CARE has provided financial assistance by funding cooperative agreements with communities annually since 2005. CARE expects to award nearly $3 million in 2008.

Goals of the CARE Program

- Reduce exposures to toxic pollutants through collaborative action at the local level.
- Help communities understand all potential sources of exposure to toxic pollutants.
- Work with communities to set priorities for risk-reduction activities.
- Create self-sustaining, community-based partnerships that will continue to improve the local environment.

Why a Community Should Consider CARE?

- If your community wants to reduce levels of toxic pollution, the CARE program can help!
- CARE assists communities by providing information about the pollution risks they face and the funding to address these risks.
- CARE promotes local consensus-based solutions that address risk comprehensively.
- Through CARE, EPA also provides technical assistance and resources, thereby helping communities to identify and access ways to reduce toxic exposures, especially through a broad range of voluntary programs.
- As communities create local stakeholder groups that successfully reduce risks, CARE helps them build the capacity to understand and address toxics in their environment.

Take a look at some of the CARE projects in EPA's Region 4!

Georgia: Albany Tools For Change
Georgia: DeKalb County Health Department
Georgia: Harambee House, Inc., Savannah
Georgia: South Atlanta for the Environment (SAFE) Coalition, Atlanta
Georgia: Harambee House, Inc. / Citizens for Environment Justice, Savannah
South Carolina: Charleston County Area
South Carolina: City of Rock Hill

For more information, application procedures and contacts:

http://www.epa.gov/CARE/.

E-PLAN CONT'D

TRADITIONAL RESPONSE RESOURCES FOR HAZMAT ACCIDENTS

One of the most important factors in a successful response to a hazmat accident is for the first responder to obtain hazardous materials information quickly, completely, accurately, and in an easily understood format. Armed with this information, first responders can plan the most effective response to the incident and

1. Protect themselves from being on the casualty list,
2. Rescue victims involved in the incident,
3. Protect people in the areas around the incident,
4. Minimize property damage.

Of the 2,400,000 firefighters in the United States, about 80 percent are volunteers. They depend on concise, accurate information to protect themselves and others from hazardous chemicals. This information includes emergency contacts and phone numbers and a list of hazardous materials with corresponding quantities on hand and hazard characteristics. Much of this information is available on "Tier II forms" required by the Emergency Planning and Community Right to Know Act. Facilities file these forms with fire departments, Local Emergency Planning Committees, and state agencies; however, a 2003 survey by UT Dallas showed that fire departments had only 30 to 70 percent of the Tier II forms they should have on hand.

Worse yet, a survey of all U.S. metropolitan fire departments performed by Corpus Christi Assistant Fire Chief Michael Hernandez found that 93% had never used a Tier II form during an emergency response action. The primary reason cited was that the forms were simply not readily available during emergencies.

In addition to Tier II forms, first responders require many different kinds of important information, such as:

1. Maps of the area surrounding a fixed facility showing schools, hospitals and other Tier II reporting facilities
2. Facility Emergency Response Plans
3. Material Safety Data Sheets
4. NFPA Diamond Codes
5. Chemical profiles.

While federal and state laws require much of the above information to be filed with various federal and state agencies, it likewise is rarely available to the first responders at the scene of an incident. There are a variety of reasons for this. These types of information are reported to a number of different agencies, in response to nine major federal and dozens of state regulations. Formats and filing periods differ, some requirements overlap, others leave unfilled voids and there are few interagency coordination mechanisms available to encourage information sharing. The single most significant impediment, however, is that most of this information has traditionally been submitted to these agencies in paper formats, where it remains static in file storage areas. This prevents effective information sharing, limiting benefits from a significant reporting burden on industry.

THE NEED FOR A MODERN HAZMAT RESPONSE INFORMATION SYSTEM

In 1997, EPA Region 6, headquartered in Dallas, TX, with jurisdiction over Arkansas, Louisiana, Oklahoma, New Mexico and Texas, tasked its Superfund Response and Prevention Branch with finding a way to improve the rapid flow of critical information about hazardous materials to first responders. EPA Region 6 organized a volunteer task force of first responders, chemical industry, transportation industry, local emergency managers, academic personnel and EPA staff members. The task force developed system specifications for an emergency information system that relied on existing sources of information, utilizing simple user interfaces designed for responders. It was secure, reliable and broadly available.

In 2000, EPA Region 6 partnered with the Texas Commission on Environmental Quality (TCEQ) and the CyberSecurity and Emergency Preparedness Institute (**http://csepi.utdallas.edu/**) in the Erik Jonsson School of Engineering and Computer Science at The University of Texas at Dallas to develop the next generation of the first responder information system.

E-PLAN CONT'D

A BETTER WAY: E-PLAN, A WEB-BASED RAPID-RESPONSE RESOURCE

EPA and UT Dallas have developed a web based system that is very secure, easy to use, extremely fast and highly available. It delivers the hazmat information anywhere that wired or wireless Internet access is available. E-Plan database contains fixed facility hazardous chemical information with an individual chemical search capability that can be used in transportation accidents. Response officials must be "approved" by local county officials to become authorized E-Plan users. These authorized users then receive unique user names and passwords from the UT Dallas E-Plan Administrator.

E-Plan allows authorized users to log on to its homepage at **https://erplan.net** and get virtually instant access to the important data needed at the scene by the first responders. If the incident occurs at a facility, such as a water treatment plant, a chemical plant, a warehouse, a poultry plant, or a refinery, the dispatcher or emergency responder has access to the facility's Tier II data. Clicking on the name of a chemical brings up its associated Department of Transportation (DOT) Emergency Response Guide. E-Plan users can also pull up MSDS, chemical profiles and data from the U.S. Coast Guard's chemical hazard response information system (CHRIS). Having involved many first responders in the design process, data is presented in a format easy to read and understand at times of extreme pressure.

Information Security: The Internet security system built into E-Plan uses 128-bit encryption, firewalls, secure socket layer and other industry-standards and state-of-the-art information security mechanisms. Authorized to access all the information deemed essential to them, first responders with authenticated accounts rely on information security being as reliable as the current state-of-the-art.

Physical Security: E-Plan data is assured by storing in redundant servers located in a locked, shielded and secure location. Entry keys to these rooms are given only to a handful of authorized personnel. Written and video records are maintained of all personnel who gain access to the storage location. E-Plan's reliability is ensured by uninterruptible power supplies and backup network access line.

E-PLAN IS ALREADY IN ACTION

E-Plan database contains records for over 82,000 facilities and 22,000 chemicals in all 50 states, which automatically link to the DOT Emergency Response Guides, MSDS, and CHRIS data sheets. More than 1,700 emergency personnel have been trained as authorized E-Plan users in Texas, Arkansas, Ohio, Oklahoma, Minnesota, New York, North Carolina and Louisiana.

Assistant Chief Greg A. Rohr, Hickory, N.C., Fire Department, recommended E-Plan to his department after evaluating it as part of his October 2003 applied research project for the National Fire Academy's Executive Fire Officer Program. He looked at five computer-based electronic records-management systems for hazmat incident pre-planning and response.

"E-Plan is easy to use and provides information in a clear and concise manner," Rohr said. He wrote in his research report that it allows quick access to information that a first-arriving engine company would need about hazardous materials and provides more complex and detailed information that would be needed to manage a large hazardous materials incident. Navigating between screens is easy, the grouping of information is conducive to decision making and the information is to the point and easy to read.

Rohr was impressed with the way E-Plan parsed information.

"Although someone may argue that there is no such thing as too much information, if the information is not properly organized it can be overwhelming," Rohr said. "This program does an excellent job of organizing a tremendous amount of information in a manner that can be utilized by units responding to an emergency."

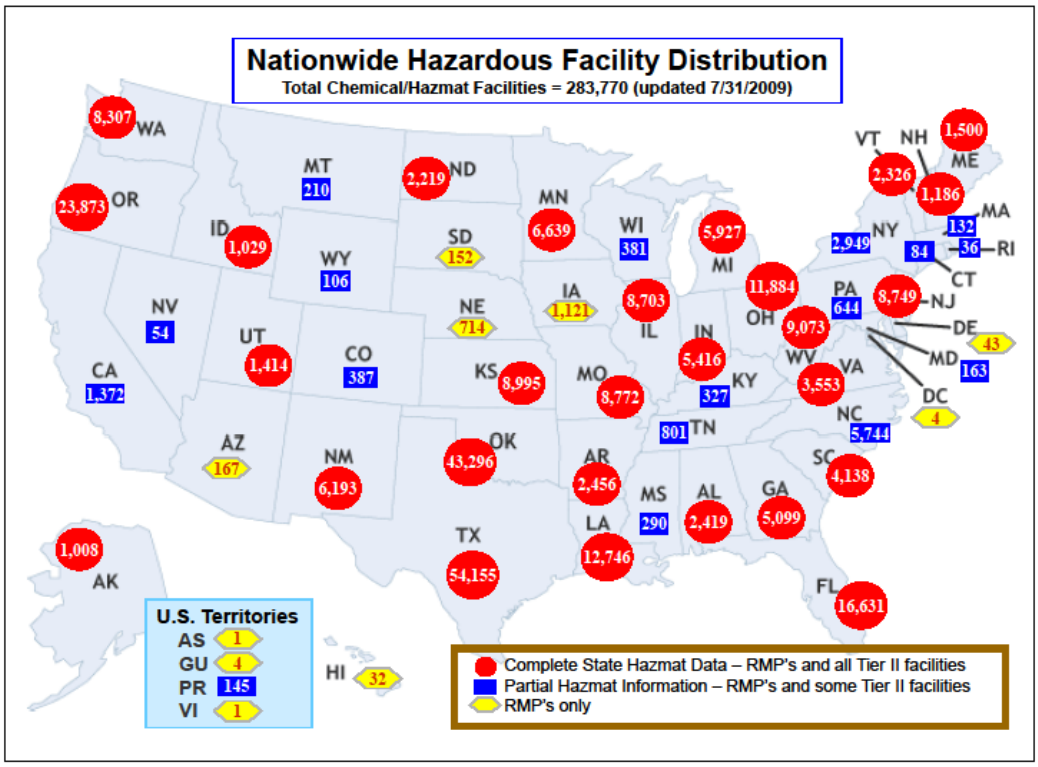
Rohr said that another advantage of E-Plan is that it allows incident commanders to expand into CAMEO ® if the incident warrants it, providing access to real-time plume dispersion modeling software. CAMEO ® is a system of software applications used widely to plan for and respond to chemical emergencies.

E-PLAN CONT'D

TIER II REPORT FILING

E-Plan is offering managers with responsibility for filing Tier II reports an online system that simplifies the process for creating the Tier II submission files. Since the system is online, there is no software to download or install. The user goes to the secure web site on E-Plan and enters his company Tier II data in a secure location that is ID and password protected. The user then creates a set of Tier II zip files that can be written to CDs or printed in hard copy and filed with the appropriate state agency.

The above article was reprinted with permission from the November-December 2007 issue of Industrial Fire World magazine.



FOR ADDITIONAL INFORMATION ON E-PLAN: Go to the E-Plan webpage at https://erplan.net or contact EPA Region 4 EPCRA E-Plan Coordinator, Vinson Poole at 404-562-9186 or poole.vinson@epa.gov.

CSB VIDEO

Apex, North Carolina, Fire Chief Mark Haraway, whose department is depicted in the video as battling a "worst case scenario" due to a lack of information from a hazardous waste facility that caught fire in 2006, said, "I recommend this and other CSB safety videos for the training opportunities they provide."

Other accidents highlighted in "Emergency Preparedness" include an allyl alcohol toxic chemical release in Dalton, Georgia; chlorine releases in Festus, Missouri, and Glendale, Arizona; a reactive chemical explosion in Jacksonville, Florida; and a recent reactive chemical explosion and community evacuation in Institute, West Virginia.

Timothy Gablehouse, a preparedness expert who appears in the video as president of the National Association of SARA Title III Program Officials (NASTTPO) and a member of the Colorado Emergency Planning Commission, said, "The CSB has done us all a great favor by compiling many of their investigation findings into a crisp and clear lessons learned message – a great reminder for us all."

The CSB is an independent federal agency charged with investigating industrial chemical accidents. The agency's board members are appointed by the president and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.

The Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA. Visit our website, www.csb.gov.

For more information, contact Director of Public Affairs Dr. Daniel Horowitz, 202-261-7613, cell 202-441-6074.

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8/2002 in Missouri – A chlorine railcar transfer hose ruptured, releasing 48,000 pounds of chlorine. Hundreds of residents were evacuated or sheltered-in-place, and sixty-three local residents sought medical evaluation; three were admitted to the hospital. The chlorine also damaged tree leaves and vegetation around the facility. The CSB determined that an excess flow valve internal to the chlorine railcar did not close, contributing to the severity of the event. As a result of such chlorine releases, the CSB has issued a recommendation to the Department of Transportation (DOT) to expand the scope of DOT regulatory coverage to include chlorine railcar unloading operations and ensure the regulations specifically require remotely operated emergency isolation devices that will quickly isolate a leak in any of the flexible hoses (or piping components) used to unload a chlorine railcar.

7/2001 in Michigan – A methyl mercaptan release occurred when a pipe attached to a fitting on the unloading line of a railroad tank car fractured and separated. Fire damage to cargo transfer hoses on an adjacent tank car also resulted in the release of chlorine gas. Neither of the two EFVs closed to control the release. Three plant employees were killed in the resulting explosion and several employees were injured. Approximately 2,000 local residents were evacuated from their homes for 10 hours. Failure of the EFVs to close contributed to the severity of the incident. The NTSB determined that the facility placed undue reliance on the tank car EFV to close in the event of a leak from the transfer line.

4/1998 in Iowa – A propane release occurred when a vehicle struck and severed unprotected, aboveground liquid and vapor lines serving an 18,000-gallon propane storage tank. The lines fed vaporizers, which fueled heaters located in barns and other farm structures. The liquid line, which was sharply reduced in pipe diameter, was completely severed where it connected to a manual shut-off valve directly beneath the tank. The release ignited and the tank subsequently exploded, killing two fire fighters and injuring seven other emergency personnel. A subsequent CSB investigation determined that the flow capacity of the liquid outlet piping system downstream of the EFV was insufficient to allow the EFV to close.

9/1999 in North Carolina – More than 35,000 gallons of propane were released when the discharge hose on an LPG transport truck separated from its hose coupling at the delivery end of the hose, and none of the safety systems on either the truck or the receipt tank worked as intended to stop the release. The DOT determined that emergency systems such as EFVs do not always function properly when a pump is used to unload the protected vessel. If a release occurs downstream of the pump and the EFV activation point is greater than the pump capacity, the pump will function as a regulator limiting the flow to below that required to close the EFV.

Two common themes in these accidents are that flow restrictions prevented the flow through an EFV from exceeding the shut-off flow rate, and emergency isolation block valves were not activated. A literature review revealed a number of additional incidents where the rates of discharge from releases were insufficient to close the EFVs.

The literature also shows, cases such as the one below, where an EFV was not installed but would have been beneficial:

7/1998 in Virginia – A natural gas release occurred in the underground feed line serving a newly constructed residence in which the occupants had moved-in just hours before. The leaking gas entered the basement where it found an ignition source and exploded killing one of the new owners and injuring the other parent and their two children. The investigation report concluded that the release was attributed to the plastic feed line being damaged by heat from a faulty splicing in a buried electrical service cable located close to the natural gas line. The natural gas feeder line was not equipped with an excess flow valve. Among the findings it was concluded that "Had an excess flow valve been installed in the gas line to the residence, the valve would have closed after the hole in the pipeline developed, and the explosion likely would not have occurred."

Understanding the Hazard
Proper use of EFVs requires an understanding of their capabilities and their limitations.

The National Fire Protection Association (NFPA) defines an EFV as a "valve designed to close when the liquid or vapor passing through it exceeds a prescribed flow rate" (NFPA 58). EFVs are most commonly used on the liquid and vapor connections of transport containers (e.g., rail cars and tank trucks) and on some stationary tankage. EFVs are often installed inside of the

CHEMICAL SAFETY ALERT

vessel so that protection is provided even if the piping external to the vessel is damaged. EFVs are also very commonly used in natural gas distribution lines serving end-users such as residential and commercial consumers.

EFVs are used with a variety of hazardous chemicals, of which chlorine, liquefied petroleum gases (LPG), natural gas and anhydrous ammonia are among the most common. Consequently, these four chemicals are used as examples in this *Hazard Alert*. Guidance for the application of EFVs with regard to these four chemicals is issued, respectively, by the Chlorine Institute (CI), NFPA, and the Compressed Gas Association (CGA). Regulatory requirements for the usage of EFVs are imposed by various state and federal agencies, including the Occupational Safety and Health Administration (OSHA) and the DOT.

The potential for flow restrictions preventing the closure of the EFV is well recognized by organizations issuing good practice guidance for the use of EFVs. For example, the CI cautions that the EFV is principally a protection against an event that damages the manual valve on the transport container during transit and not a protection against damage to connected loading or unloading system piping. The CI notes that the EFV "may close if a catastrophic leak involving a broken connection occurs but it is not designed to act as an emergency shutoff device during transfer." CI guidance does not specify the use of EFVs on stationary tankage, but recognizes that some users choose to use EFVs in such a manner.

The installation of EFVs in stationary tankage is commonly used with LPG and anhydrous ammonia. NFPA, in its *Liquefied Petroleum Gas Code*, specifies that, where EFVs are required, the "connections, or line, leading to or from any individual opening shall have greater flow capacity than the rated flow of the excess-flow valve protecting the opening." CGA, in its *Safety Requirements for the Storage and Handling of Anhydrous Ammonia*, specifies that "piping, including valves and fittings in the same flow path as the excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve."

The National Propane Gas Association (NPGA) notes a number of conditions which could result in the failure of an EFV to close:

- Piping system restrictions such as pipe length, branches, reduction in pipe size, and partially closed shut-off valve, could limit the flow rate through the EFV.
- The size of break or damage downstream of the EFV is not large enough to allow a flow sufficient to close the valve.
- The system pressure upstream of the EFV is not high enough to produce a closing flow rate.
- Foreign matter such as welding slag or a build up of process contaminants lodged in the EFV can prevent its closing.
- The piping break or damage occurs upstream of an in-line EFV.
- The flow through the EFV is in the wrong direction.
- The EFV has been damaged, or is otherwise not operable.

Recognizing the limitations inherent in the design and application of EFVs, NPGA, CI, NFPA, and CGA all recommend or require the use of some secondary means of preventing uncontrolled releases in certain high risk situations.

Controlling the Hazard
Careful analysis is required in order to determine how much reliance can be placed upon EFV's ability to bring the rate of release under control, and to identify any necessary and appropriate supplemental controls for accidental releases.

System Design and Installation

System design and installation issues must be considered in evaluating the degree of reliance to be placed on an EFV. Considerations should include:

- For the EFV to close, the failure in the downstream piping must result in enough flow to exceed the EFV activation point. Analyze credible, catastrophic failures at likely release points, such as flexible hoses in unloading systems, to determine if the flow resistance in the piping both upstream and downstream of the EFV might prevent the EFV from closing.

- The characteristics of the hazardous material have to be considered. Release rate calculations must address the effect on flow rate of two-phase flow that will result upstream of the release point when liquefied compressed gases flash to vapor as system pressure is released.

- The pressure in the vessel must be adequate to produce the flow necessary to seat the EFV. Consider the effects of low vapor pressure liquids and minimum credible winter temperatures.

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- The type of EFV specified must be appropriate to the intended service, and any necessary constraints on the physical orientation of the valve must be identified.
- The system must be installed in strict accordance to design specifications.
- The flow capacity of the EFV must be great enough to avoid nuisance flow stoppages caused by normal variations in process flow rates, but not so high as to negate its protective function.
- A piping system network with smaller branch lines coming off the main line will need separate EFVs to control releases in these branch lines.
- A release that is not large enough to activate the EFV can still be large enough to lead to serious consequences and thus require alternative control capability.

Operation and Maintenance Practices

Like any safety device, an EFV must be properly maintained and operated in order for it to provide its intended protective function. There should be:

- An appropriate inspection, testing (including verification of flow rate necessary to activate the EFV), and preventive maintenance program for the EFV based upon past experience, the characteristics of the process stream, and standard EFV maintenance guidelines (*e.g.*, CI Pamphlet 042, which may provide guidance to facilities handling other chemicals).
- Operating procedures and training to address the operation of the EFV and all supplemental controls.
- Controls to manage system changes that might otherwise compromise the function of the EFV. (Management of Change)

Determining the Need for Additional Protection

Facilities, absent any applicable industry guidance or regulatory requirements, should take a risk-based approach in evaluating the need to supplement EFVs in controlling accidental releases. Considerations, addressing both the consequences and the likelihood of a catastrophic release, would include:

- The hazardous nature of the chemical involved, such as toxicity, flammability, and hazard to the environment.
- The size of potential releases, depending on the potential for significant back-flow to the point of release, size of inventory, and flow rates involved.
- The likelihood of a release, depending on frequency of loading and unloading operations and type of equipment used. A system containing flexible hoses or articulated (swivel-joint) piping may be more prone to a release than a system containing more robust rigid piping.
- Local conditions such as the possibility of flooding, mud or rock slides, washouts, sink holes and subsidence or other earth movement situations warrant particular attention for stationary systems.
- The severity of a credible release on surrounding populations, workers, facilities, and the environment.

Alternative/Additional Means for Controlling Releases

Industry guidance and regulatory requirements increasingly recognize the prudence of providing alternative means of stopping accidental releases in certain situations, either in place of or in addition to EFVs. Examples of approaches used in industry include:

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- Remotely isolating leaking transfer systems, with particular emphasis on flexible hoses, by bolting fail-safe (air-to-open) actuated valves on the discharge side of railcar manual valves.

- Shut-off protection by quick closing valves that can be controlled from locations that would be accessible even in the event of a release.

- Emergency shutoff valves equipped for remote manual closure and automatic shutoff using thermal (fire) actuation or chemical detection. The valve may be internal to the tank, in lieu of an EFV, or it may be installed external to the tank as close as practical to the tank outlet, provided there is an internal EFV. Emergency shut-off systems should be thoroughly tested on a regular schedule to ensure that they will operate as intended when needed.

- Commercially available hoses with a self closing device at each end that will shut off flow entering the hose from either direction if the hose is pulled apart or sheared may be considered as an additional measure of protection. Such devices will protect against hose failure, but not against leaks that occur upstream or down-stream of the hose.

The technologies, systems, and practices cited above are meant only to be illustrative; they do not constitute a definitive list of options, and are not meant to establish 'requirements' for any particular application. Additional details are provided in the references at the end of this *Alert*. References to regulatory requirements and industry best practices are not intended as interpretations and users should consult the referenced documents to determine applicability to their own particular circumstances.

If it is determined that manual ("hand-on") intervention is the most appropriate approach to responding to releases, a critical analysis should be made of issues such as: the number and location of isolation valves relative to likely points of release; the properties of the released chemical and the correspondingly required personal protective equipment (PPE); personnel staffing, location and response times; and the adequacy of training provided to personnel responding to a release.

What Needs To Be Done

EPA urges users of EFVs to evaluate their applications to verify the operability of in-place controls and to determine whether additional controls are warranted to minimize the risk of release of hazardous materials. Industry experience indicates that sole reliance on EFVs to control accidental releases may not always be sufficient and needs to be substantiated by a thorough engineering and risk evaluation. In most cases where supplemental controls were available and clearly identified, they were successfully applied. Where this has not been the case, appropriate revisions should be made to Risk Management Program elements such as operating procedures, training, and emergency response plans.

Conclusion

Millions of EFVs are in service and each year many properly-sized and correctly installed EFVs operate as intended to greatly mitigate the consequences of hazardous material releases. Incident investigations show that when the EFV was in place but did not function as intended, it was usually because either the valve was not correctly sized and flow-rated or line restrictions or low inlet pressure prevented sufficient flow needed for valve closure. Mechanical malfunction of the EFV is very rarely shown to be a contributing factor. Release rates that are less than the EFV activation rate represent a very serious situation. Natural gas or city gas leaks downstream of the regulator or meter fall into this category. Alternate or additional means of release prevention/mitigation should be installed for high-risk situations and situations where EFV's may not be effective.

For More Information:

Call the Superfund, TRI, EPCRA, Risk Management Program, and Oil Information Center

(800) 424-9346 or (703) 412-9810 TDD (800) 553-7672 or (703) 412-3323

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Chemical Emergency Preparedness & Prevention Office (CEPPO)
http://www.epa.gov/ceppo/ or
http://www.epa.gov/emergencies/index.htm

EPCRA Section 313 Toxics Release Inventory (TRI) Homepage
http://www.epa.gov/tri/

Compliance and Enforcement
http://www.epa.gov/compliance/index.html

National Response Center (NRC)
http://nrc.uscg.mil/ or 1-800-424-8802

Compliance Assistance Clearinghouse
http://cfpub.epa.gov/clearinghouse/

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