Volume 26
No. 4
October, 2013

REGION 6 LEPC UPDATE

Steve Mason, EPA Region 6
Mason.steve@epa.gov
Hilary Gafford, Weston Solutions
Hilary.gafford@westonsolutions.com

In this issue, we start a series by Alliance Solutions Group on Planning and Hazards Analysis; as well as short article by our old friend, Fred Cowie.

- Steve and Hilary

EMERGENCY PREPAREDNESS FOR NATURAL DISASTERS AND SEVERE WEATHER EVENTS

Courtesy of OSHA

In response to the recent flooding events and wildfires in different regions, it is important to remember to always be prepared for natural disasters and severe weather events.

Below is a link from OSHA that provides important information for when catastrophic events occur. This link provides information for preparing and responding to hurricanes, tornados, floods, wildfires, and winter storms. The information includes understanding what the warnings for each type of event means, how to prepare emergency supply kits and evacuation plans, and information regarding the response and recovery phases of the different types of events.
http://www.osha.gov/SLTC/emergencypreparedness/index.html

It is important to be prepared as a citizen and as response personnel.

THREE NEW CHEMTREC VIDEOS FOR EMERGENCY RESPONDERS ARE NOW AVAILABLE ON-LINE

Courtesy of CHEMTREC

Three newly refreshed CHEMTREC® videos for Emergency Responders are now on-line. Links to all three videos are posted below. These videos will be available on the CHEMTREC® and the American Chemistry Council's web sites. Please share these links with anyone who could benefit from this valuable information.

Video 1 – An Overview of CHEMTREC®
Video 2: - How CHEMTREC® Helps First Responders
Video 3: - What's Being Said About CHEMTREC®

These videos will also be available on DVD within the next month.

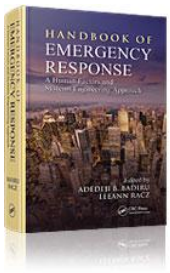
CHEMTREC® is the definitive information resource and solutions provider for hazardous materials and dangerous goods response.

A service of the American Chemistry Council (ACC), CHEMTREC® has a broad range of critical resources that can help emergency responders mitigate incidents involving hazardous materials, such as:

- A round-the-clock communications center staffed by trained and experienced emergency service specialists;
- Immediate access to thousands of chemical product specialists and hazardous materials experts through CHEMTREC's database of over 30,000 manufacturers, shippers, carriers, public organizations and private resources;
- A state-of-the-art telecommunications system that supports the virtual emergency response team, seamlessly linking on-scene responders with chemical experts, transportation companies, and medical experts;
- An expansive electronic library of over 5 million Safety Data Sheets (SDS);
- A database of medical experts and chemical toxicologists who provide advice and emergency medical treatment assistance to on-scene medical professionals treating victims of product exposure; and Interpretation capabilities for more than 180 languages in the event of an emergency involving non English speaking stakeholders.

PREPARING COMMUNITIES THROUGH ALL-HAZARDS PLANNING AND ANALYSIS

Courtesy of Bob Campbell, PE
President, Alliance Solutions Group, Inc. (ASG)
www.asg-inc.org; robert.campbell@asg-inc.org



About the Author: Bob Campbell has been preparing communities as a responder and consultant for the last 18 years. After founding ASG in 2005, he has overseen the development of all-hazards plans with emphasis on hazardous materials in over 60 communities. ASG has conducted over 2,000 hazardous material response exercises while supporting 760 locations world-wide. Bob leads ASG with a focus on capturing and sharing lessons learned, best practices and case studies to improve community preparedness. He is a contributing author in the recently released book "Handbook of Emergency Response: A Human Factors and Systems Engineering Approach."

Over the last year, we have witnessed several high-profile chemical incidents at West Fertilizer Plant, TX (Apr 17, 2013), Geismar, LA (Jun 13, 2013), and a Blue Rhino Plant in Lake County, FL (Jul 29, 2013). Each of these incidents involved fire and/or subsequent explosion of the hazardous materials stored on site. In 2012, 12,073 hazardous material releases from fixed facilities and storage tanks were reported to the National Response Center nationwide (3,373 releases from facilities in Region 6).

National Response Center
1-800-424-8802

These and other scenarios, highlight the need for all-hazards planning and evaluation of the fate and transport of the hazardous materials. Despite regulatory gaps, LEPCs, Fire Departments and Emergency Managers need to recognize and anticipate the potential hazards associated with facilities in their communities in order to adequately prepare for, respond to and recover from these incidents. The remainder of this article will highlight a community's approach to conducting all-hazards planning which results in an informative, risk-based, actionable plan.

The community should use the same basic risk assessment process outlined by the Federal Emergency Management Agency, to collect quantitative data to more accurately assess the risk and prevent bias. The overall process involves:

- Identifying the hazards,
- Assessing the risks,
- Risk Management, and
- Developing Emergency Response Procedures.

Identify the Hazards:
There are several types and sources of hazards that could impact a community. The two main sources are mobile and stationary sources. Mobile sources include transportation of hazardous materials over roads, rail, waterways, air and pipelines. Stationary sources include fixed plants, facilities, or storage tanks. Each of these hazards may be identified using the following approach:

Mobile Sources: The first step is to determine hazardous material transportation routes that cross through the community including road, rail and shipping routes.

Highway: The U.S. Department of Transportation Federal Motor Carrier Safety Administration has a list of the current designated, preferred and restricted routes on the following website: http://www.fmcsa.dot.gov/safety-security/hazmat/national-hazmat-route.aspx. Review the PHMSA transportation statistics and commodity information at (http://www.phmsa.dot.gov/hazmat/library/data-stats). This site includes national statistics, statewide statistics and local commodity flow studies, where available.

Railroads: Determine which railroads transit the community and contact the railroad hazardous material manager to obtain the commodity flow.

Waterways: We have had success in working with port authorities in collecting both quantitative and general qualitative data about specific commodities transiting ports.

Airports: Air safety has significantly improved over the years and likelihood of an incident resulting in a release of hazardous materials is extremely low but worth investigating with the airport authority or port operations.

Pipelines: Communities that have pipelines typically transport petroleum, natural gas, and/or ammonia. Pipeline owners may be able to provide maps of their pipelines to planners.

Stationary Sources: Chemical Hazards: Stationary sources comprise approximately 70% (NRC statistics, 2012) of hazardous material releases throughout the US. Typically, LEPCs collect Tier II reports from reporting facilities to identify hazardous materials. Unfortunately, Tier II reports alone are inadequate in providing a comprehensive picture of hazards in the community due to the high reportable quantity of 10,000 lbs unless it is deemed extremely hazardous.

So, what can planners do to identify all of the hazards in their community? A community should address this by widening the search window beyond EPCRA-required Tier II reports. Emergency Managers can also download EPCRA Toxic Release Inventory data from the EPA Envirofacts website http://www.epa.gov/enviro/facts/tri/search.html.

Using the Form Rs coupled with the Tier II reports, a community will gain some additional insight into hazardous materials stored at facilities and occasionally discover discrepancies/omissions of Tier II reports. Additionally, a community should search other EPA repositories such as for information pertaining to the Clean Air Act Risk Management Program (RMP), Clean Water Act discharge permits, hazardous waste permits, etc. Research like this was conducted for a TX community and identified 868 facilities where as Tier II reports yielded only 50 facilities. Imagine a fire fighter reporting to a strip mall for a fire and encountering a dry cleaner, vehicle maintenance garage and home improvement store. Wouldn't they like to know what hazards are present at these facilities?

Radiological Hazards: In additional to chemical hazards, a community should identify radiological hazards such as radioactive materials, nuclear power plants, and reactors. The U.S. Nuclear Regulatory Commission (NRC) provides resources for finding nuclear facilities near the community through the facility locator section of its website, http://www.nrc.gov/info-finder.html.

Second, Emergency Managers can obtain a copy of radioactive material licenses from federal and state regulators. While most radioactive materials stored within a community consist of sealed or medical sources with a relatively low activity, the potential for exposure from building fires exist; therefore, first responders should be aware of the existence of this hazard.

Assessing the Risks*:*
There are many ways to define risk, but the overall objective is to prioritize those hazards with the highest relative risk. So, as long as a consistent method that captures the contributing factors is utilized, the outcome will provide the intended result. Before conducting a risk assessment, it is important to determine how the

output will be utilized so that Emergency Managers can select the most applicable and useful approach. To avoid bias, a community should use a quantitative risk method. For the purposes of this discussion, we are calculating the risk of a release occurring which impacts the surrounding population. Since risk controls vary greatly and are difficult to measure quantitatively, a community should determine risk based on the probability and severity of a release scenario.

Severity: A community should determine the impact of a release through dispersion or plume modeling for materials in sufficient quantity to pose a toxic inhalation hazard. Second, conduct explosive overpressure modeling for materials that have the potential for explosion as a result of a fire or of other means. This identifies the blast pressure zone around explosive/combustible materials. Also to be identified are critical facilities in the hazard zones such as schools, emergency responders and medical facilities. The severity should be measured numerically by determining the population at risk within the different intensities of the plume using GIS.

Probability: Hazardous materials releases can be accidental, intentional or triggered by another incident such as natural disaster. Assessing causal probability requires multiple assumptions in order to utilize widely-accepted hazard data sets. This enables a quantitative approach which results in a relative probability for each hazard enabling Emergency Managers to prioritize resources for further analysis, planning, training, exercises, personnel, etc. and compare technological and natural threats. This approach is extremely helpful, despite the assumptions made throughout the process, to Emergency Managers in supporting allocation and prioritization of scarce resources. This method factors in the following causal events when determining probability by using historical/statistical data found at government websites:

- Floods, http://www.floodsmart.gov/floodsmart/
- Earthquakes, http://earthquake.usgs.gov/hazards/
- Tornados, http://www.ncdc.noaa.gov/stormevents/
- Forest fires, typically found on state-specific repositories
- Hurricanes, http://www.e-transit.org/hurricane/welcome.html, and
- Accidental spills/uncontrolled releases (historical/statistical analysis).

The probability of an accidental spill or release is estimated using the incidence rate reported at the National Response Center (http://www.nrc.uscg.mil/incident_type_2000up.html) considering the number of chemical storage facilities (http://www.bls.gov/data) in the US. Finally, when analyzing specific populations at risk, we need to account for the probability of wind direction and wind speed. This can be obtained by a representative windrose for each community.

Risk Calculation: Relative risk can be calculated by the product of the severity (population exposure) and the probability of a release impacting the particular downwind population. Prioritizing these risks enables the Emergency Manager to further address high-risk facilities and prioritize mitigation and preparedness resources accordingly.

Risk Management:
Risk management is the process of identifying and implementing control measures to mitigate, prevent, prepare for, respond to and recover from the risks identified during the risk assessment. With a prioritized list Emergency Managers can assess their communities' capability to address the technological risks.

First, risks are best controlled at their source. LEPCs can play an active role in developing a working relationship with facility operators to become familiar with their hazards and risk control measures. Some facility risk control measures include: automated early warning leak detection devices, shut off valves,

secondary spill containment, availability of trained on-site hazardous material response teams, personal protective equipment, and effective spill control plans.

Second, risks can be prepared for through local planning, training, analysis, and exercises. Given a list of high risk facilities and hazards, the Emergency Manager should account for these risks in their preparedness program by developing resources adequate to respond to and recover from these types of incidents. This may involve developing mutual aid agreements and identifying canned requests for assistance from surrounding communities and state resources.

Local planning may also culminate with fire departments developing pre-fire plans for each of the facilities in their district. This may result in further tailoring of resources such as detectors, personal protective equipment and specialized training. With scarce resources, community responders can prioritize allocation of resources based on the risk assessment.

Developing Emergency Response Procedures:
Since many hazardous materials response plans are annexes or appendices to the EOP and EPCRA requires these plans to address emergency response procedures, it is important to ensure interoperability and solid cross-references to these procedures in the hazardous material response plan. There are several critical items to address:

Administrative Information: Contact information for emergency management, first responders, critical infrastructure, vulnerable facilities/population centers, and hazardous material facilities (local contacts) must be included and current. Phone numbers should be checked annually to ensure accuracy.

Notification Procedures: Timely notification of a release is critical to ensure the effectiveness of subsequent protective action implementation. Due to the myriad of regulations impacting these facilities, there are numerous filings required in case of a spill.

Public Protective Actions: Upon size up of an incident, the incident commander will determine if any public protective action such as evacuation or shelter-in-place, are needed to protect the population at risk. Shelter-in-place is generally implemented when the release or spill has occurred and the concentration of the hazard is dissipating with time. Evacuation is generally implemented when the release of the hazard is on-going and the risk of exposure in buildings is greater than the risk of exposure during evacuation. Several factors should be considered such as the toxicity of the substance, duration of evacuation/exposure, and the availability of accessible evacuation routes. Because there are so many factors to account for when considering evacuation, we assist communities in employing a DHS-validated, online tool called Real-time Evacuation Planning Model (RtePM) - http://rtepm.vmasc.odu.edu. This sophisticated transportation analysis tool enable planners to estimate the time it will take to evacuate areas of the community based on a number of assumptions through a GIS interface. We find that this tool is valuable in planning evacuation routes to optimize evacuation time and can be used during an incident to further refine the conditions and assumptions to continuously optimize evacuation.

Mass Notification: After deciding on public protective actions, it's critical that the population at risk receive an effective and actionable message in a timely manner. Communities use several means of notification: reverse 911, opt-in notification systems, social media, radio, television, and sirens. These should be tested periodically to measure their effectiveness and ensure the citizens are aware of how they will be notified and what actions to take when they are notified.

Recovery: Recovery planning is often overlooked, but needs to be thoroughly addressed in plans by determining and detailing some of the time-sensitive tasks that may be necessary upon transition from response to recovery. The community should be prepared to call in experts in spill response, clean up and

restoration. These contractors should be listed in the plan as a starting point. *Best Practice: Some communities establish a blanket purchase agreement with these firms so that in case their services are needed, the contracting mechanism is already established and ready to execute.*

The potential release of hazardous materials could have a tremendous impact on a community. Comprehensive risk-based planning not only prepares communities for all-hazard threats but, it also meets regulatory requirements and guidance from DHS and EPA for hazardous material response plans. Following the process outlined in this article provides a foundation for success. For further information about this process, or the tools mentioned throughout, contact Bob Campbell at www.asg-inc.org or 757-223-7233.

OSHA ISSUES NEW RESOURCE TO PROTECT EMERGENCY WORKERS AT COMBUSTIBLE DUST FIRES

Courtesy of Industrial Fire World

WASHINGTON – The Occupational Safety and Health Administration has published *Firefighting Precautions at Facilities with Combustible Dust*, a new, informative booklet that outlines safe procedures for emergency responders who may face fires and explosions caused by combustible dust.

"This booklet will keep both emergency response and facility workers safe by giving them a framework to prepare for potential emergencies involving combustible dust," said Assistant Secretary of Labor for Occupational Safety and Health Dr. David Michaels. "Stakeholders that have reviewed the booklet, including fire chiefs and union health and safety representatives, describe it as 'an excellent resource for explaining the hazards associated with combustible dust and outlining the best practices for pre-incident operational preparation by emergency responders.'"

Since 1980, more than 130 workers have been killed and more than 780 injured in combustible dust explosions. The publication describes how combustible dust explosions occur and uses previous incidents to illustrate how firefighting operations can prevent combustible dust explosions. The booklet explains the preparations emergency responders can make before a response and how these preparations will affect the operational plan during a response.

Additional materials including quick cards, posters, and are available at www.osha.gov under Publications Section, Topics, and Combustible Dust:

https://www.osha.gov/Publications/OSHA_3644.pdf

https://www.osha.gov/pls/publications/publication.athruz?pType=Industry&pID=250

RISK ASSESSMENT -- PRE-PLANNING FOR MOLTEN MATERIAL RELEASES

Industrial Fire World, Spring 2013

John Frank

Analysis of Industrial Fire World's incident logs indicates a number of molten materials releases. These incidents are highly specialized and something that is rarely – if ever – discussed in fire fighting schools. Molten materials releases can include glass, steel, aluminum, other metals, sulfur or salt. Molten asphalt is excluded from this discussion because unlike the other products, it is combustible and is not hot enough to cause the kinds of damage addressed below (i.e. destroying steel).

Spills of these materials can be hot enough to damage steel columns and certainly to ignite any combustibles in the area. As an example, if a glass furnace, as would be found in a glass bottle plant, experiences a leak into the pit below the furnace, and if the supporting steel columns are not protected by refractory brick, the steel supports could fail and the entire furnace could collapse into the pit. The result would be a huge loss and extensive business interruption. Likewise, a molten steel spill can sever hydraulic lines and ignite the fluid within. Needless to say, molten material is a severe personnel exposure hazard.

The text Industrial Firefighting for Municipal Firefighters describes how spilled molten metal can ignite cable trays, which can shut down process controls and also spread the fire.
National Fire Protection Association (NFPA) codes and standards offer some guidance on these hazards. NFPA 484 references the word molten 58 times. NFPA 86, Standard for Ovens and Furnaces, addresses molten salt bath furnace hazards. Local fire and building codes offer little or no additional information. Insurance industry loss control standards or corporate procedures are the best sources of information. References include:

FM Global Data Sheet 7-25, Molten Steel Production
FM Global Data Sheet 7-26, Glass Plants
FM Global Data Sheet 7-33, High Temperature Molten Materials
FM Global Data Sheet 7-64, Aluminum Industry
XL GAPS Guideline 17.4.0, Steel Industry Abstract
XL GAPS Guideline 17.4.1, Basic Oxygen Furnaces
XL GAPS Guideline 17.13.0, Aluminum Industry Abstract
XL GAPS Guideline 17.22.1, Glass Melting Furnaces

According to NFPA Standard 655, Standard for Prevention of Sulfur Fires and Explosions, molten sulfur can release dissolved hydrogen sulfide which is both toxic and flammable. NFPA Standard 484, Standard for Combustible Metals, describes various reaction hazards with molten metals, including a thermite reaction between iron scale and molten metal.

Sprinkler protection is typically excluded from molten material use areas because of the potential for a violent steam explosion which would throw molten material over a wide area. Fire protection water can even dissociate and release hydrogen. Water and molten aluminum reactions have been especially violent.

This means that combustible materials cannot be allowed in molten materials use areas. Hydraulic fluid should be avoided or else must be approved for use in these areas.

Housekeeping (removal of residues) is needed because this residue can spread a fire even if no other combustibles are present.

Each process has its own specific hazards. Be aware of the basic issues and hazards. It is critical to work with facility process experts. We have found that most facilities have the knowledge and experience to manage these incidents. Plant experts need to be a key part of the incident command system. For example, in the glass industry, carefully controlled water application under the direction and supervision of plant specialist can help control leaks.

Needless to say, prevention is the best measure. During preplanning sessions, about refractory relining and thermographic monitoring. Refractory is a special type of brick that can withstand these high temperatures. Due to the extreme strain on the refractory, adhere to regular monitoring and replacement schedules. Likewise, some vessels have water cooling to deal with high temperatures and monitoring is needed to ensure that no water contacts the material or vice versa. Water must also be kept out of molten material containment pits. In the aluminum industry, for example, several precautions are taken to prevent any contact of molten aluminum and water. Preplanning is the key to successful resolution of an incident.

EMERGENCY RESPONSE NUMBERS

Arkansas Dept. of Emergency Management	**800-322-4012**
Louisiana State Police	**877-925-6595**
New Mexico State Police	**505-827-9126**
Oklahoma Dept. of Environmental Quality	**800-522-0206**
Texas Environmental Hotline	**800-832-8224**
National Response Center	**800-424-8802**
EPA Region 6	**866-372-7745**
CHEMTREC	**800-424-9300**

Strain, Stress and Management Thereof

@ 2013 Frederick J. Cowie, Ph.D
406-431-3531 fredcowie@aol.com

My recent Stress Management class with a group of highway engineers and likeminded folks at a West Coast meeting hosted by the National Academy of Sciences showed the importance of the education, training, experience, and prior knowledge of class attendees when trying to deal with what the world nebulously and ambiguously calls stress.

Most people seem not to appreciate that communication depends entirely upon the fact that words often have technical and legal definitions and that words need to have the same meaning for both sides if anything substantial is to be communicated.

Ask the person on the street (or the participants in a normal Stress Management class) to define stress and you get a myriad of concepts, but nothing very useful to a trainer trying to help individuals develop what the world calls stress management skills.

However, when dealing with engineers, it's simple, for all you have to do is use the terms "stress" and "strain," words which have real meanings, technical meanings, definable, repeatable, concrete meanings to engineers, architects, et al.

When I said to the highway engineers "Sometimes you have to do stress management, and sometimes you have to do strain management," everyone got it, everyone nodded, and everyone perked up.

Then I said "Sometimes the problems compression, sometimes it's tension." For those engineers, I was real, and I was golden. Why? I used real words. Appropriate words. Words with meanings. Words with meaning.

Region 6 LEPC Coordinators			
Arkansas	**Kenny Harmon**	**501-683-6700**	**kenny.harmon@adem.arkansas.gov**
Louisiana	**Gene Dunegan**	**225-925-6113**	**gene.dunegan@dps.la.gov**
New Mexico	**Daniela Bowman**	**505-476-0617**	**daniela.bowman@state.nm.us**
Oklahoma	**Tom Bergman** **Bonnie McKelvey**	**405-702-1013** **405-521-2481**	**tom.bergman@deq.ok.gov** **bonnie.mckelvey@oem.ok.gov**
Texas	**Bernardine Zimmerman** **Chase Yarbrough**	**800-452-2791** **512-424-2447**	**Bernardine.zimmerman@dshs.state.tx.us** **chase.yarbrough@dps.texas.gov**

- The articles herein are provided for general purposes only.
- EPA does not accept responsibility for any errors or omissions or results of any actions based upon this information.
- Please consult the applicable regulations when determining compliance.
- Mention of trade names, products, or services does not convey, and should not be interpreted as conveying official PEA approval, endorsement, or recommendation.