Pipeline Emergency Preparedness & Training: Pipeline Emergency Training Resources- NASFM Pipeline Emergencies Course

Providing information to emergency responders on how to effectively handle a pipeline emergency has been an ever increasing focus for the industry, trade associations, and government entities. In 2002, this effort was significantly enhanced through a partnership formed by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the National Association of State Fire Marshals (NASFM). This partnership resulted in the development and production of Pipeline Emergencies, a multi-faceted training program consisting of a student manual, a DVD, a CD including interactive training scenarios, and a website dedicated to this mission. The program was completed in the fall of 2004, and over 43,000 copies of the materials were distributed to emergency response agencies nationwide. A cornerstone of this effort was joining the subject matter experts from the emergency response community and pipeline industry to create a comprehensive training tool. Train-the-Trainer sessions were held around the country, bringing together the emergency response community and pipeline industry with a focus on enhancing emergency response and preparedness.

Pipeline Emergencies is a unique training tool. From “well head to burner tip”, the program provides comprehensive, in-depth information concerning natural gas and flammable liquids production, storage, and transportation. In addition to addressing the mechanics of energy transportation and the physical characteristics of the commodities transported by pipeline, the program covers a variety of emergency situations that can occur during transportation, and provides easy to understand recommendations for response and mitigation. Several realistic pipeline-related emergency scenarios are presented to provide

Pipeline Emergency Response Tactics: Response to Abnormal Pipeline Operating Conditions on Gas Pipelines

While operational upsets involving pipeline operations are rare, they do sometimes occur and may result in notification to public sector responders. Operational upsets can cause a release of natural gas or carbon dioxide gas into the atmosphere in a controlled manner, but differ significantly from an emergency caused by outside force damage from unauthorized excavation activity that can result in an uncontrolled release and fire.

The most common type of operational upset is that of a blowing relief valve. Relief valves are installed at above ground pipeline stations as a method for diverting pipeline pressure in the event of a regulator failure. Relief valves typically have a cap (similar to that on a diesel engine stack) or a rubber boot to protect the stack of the relief valve from rain, and pests such as birds and insects.

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a tool for reinforcing the learning objectives. The segment on the Incident Command System (ICS) is a key component of the training, and provides an overview of how public sector emergency responders and pipeline operator personnel can operate jointly within a Unified Command structure. Pipeline Emergencies is not only a beneficial tool for public sector emergency responders, it can be useful for orienting new pipeline operator employees in the areas of general operation and emergency response.

In 2011, the Second Edition of Pipeline Emergencies was produced in an “e-book” format. This method of production was chosen to make the training materials more widely available to the emergency response community. The 2011 version incorporates additional information on products and transportation, as well as lessons learned from responding to recent pipeline emergencies. The program manual is presented in a PDF format that can be easily navigated on-line, or be printed in its entirety. A free registration process is required to access the training manual. Also available on the website are instructor training guides for each chapter containing teaching notes, student handouts, PowerPoint presentations and testing materials, as well as interactive scenarios.

Public sector emergency response agencies are encouraged to seek participation from pipeline operators when delivering the Pipeline Emergencies training program. Pipeline operators can provide specific information concerning the products transported in their systems as well as company specific emergency response guidelines. Coordination between public sector responders and pipeline operator personnel in advance of response to a pipeline emergency enhances everyone’s top priority, safety! The program can be accessed online at www.pipelineemergencies.com.

Overview of Pipeline Systems: Pipeline Integrity Management

The Pipeline Safety Act of 2002 passed by Congress mandated a landmark new regulation called the Gas Pipeline Integrity Management Rule. A prior regulatory initiative established integrity management requirements for hazardous liquids pipelines. Both of these mandates require pipeline operators to identify areas of high consequence along the rights-of-way, and to establish comprehensive programs to assess the integrity of the pipelines themselves. A multi-faceted program, the Pipeline Integrity Management Rule has become a significant focus for operators across the country.

The first step that operators must complete is to identify “covered segments” of pipeline based on population and land use. A covered segment is a portion of the pipeline located in what is termed a “High Consequence Area” or “HCA”. A rather complex engineering process is used to model the impacts of pipeline releases to determine what the impact would be to the surrounding area, thus determining an HCA. As the Pipeline Integrity Management Rules for hazardous liquids and for gas was taking shape, pipeline companies were required to develop a comprehensive Integrity Management Plan that addressed 14 required program elements mandated in the law.
Once the “covered segments” are identified, the pipeline operators must develop specific plans to assess the condition of the pipelines. These assessments can be accomplished using the methods below:

**Internal Inspection** - This method uses internal inspection devices commonly referred to as “smart pigs” to assess the condition of the pipeline segments. These assessments can identify potential loss of wall thickness of the pipeline as well as any damage that may have occurred from outside force such as excavation activity in proximity to the line.

**Pressure Tests** - Pressure tests using water in most cases can be conducted to assess the integrity of the pipeline. Pumps are used to fill and pressurize the pipeline to a pre-set pressure based on engineering calculations for a specified period of time to assess its integrity.

**Direct Assessments** - In this method a variety of processes can be employed that include data gathering, indirect examination, direct examination, and post-assessment evaluation. In many cases assessments take the form of highly sophisticated above ground electronic tests of the condition of the pipeline.

**Other Proven Technologies** - The Pipeline Integrity Management Regulation allows operators to use newly evolving technologies for assessment as they emerge and are proven to be reliable.

Of particular interest for emergency responders, the Pipeline Integrity Management Rule has provisions for operators to consult with local emergency officials concerning changes in land use or population that may result in creation of new covered segments. This provision was included to recognize that local emergency officials are often the best source of information concerning changes in the community that they serve.

The overall goal of the Pipeline Integrity Management Rule is to enhance safety and ensure long term continuity of our vital energy transportation infrastructure.

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**Best Practices from Emergency Response Peers**

“My agency makes every attempt to attend annual pipeline operator trainings when offered in my area.”

**Emergency Management, Lenawee County, Michigan**

“We hold yearly pipeline incident tabletop drills and attend local pipeline operator-sponsored training meetings.”

**Texas Highway Patrol, Marshall, Texas**

“We include gas line emergencies and responses in our annual in service for fire training.”

**Washington Township Fire Department, Zanesville, Ohio**

“We attend a yearly open house at Kinder Morgan. We are given a tour of the facility and share how we would respond to an emergency.”

**Finney County Emergency Management, Garden City, Kansas**

While 911 is the readily identifiable telephone number to report an emergency, 811 is the number to provide notification of pending excavation activity so that utilities can properly locate underground assets. Help us spread the word for safety….

**Call 811 before you dig!**

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**Keeping Pipelines Safe/Practices & Protocols: Pipeline Construction Practices**

As the energy requirements of our country continue to grow, new pipelines will need to be constructed to satisfy our demands. Pipeline construction technology has made significant strides since the days of steam shovels and mules. It’s important to note...
however that pipelines installed years ago can last indefinitely through proper maintenance procedures. Today, new pipelines are constructed using the most up-to-date materials and processes by highly trained technicians.

Pipeline construction truly begins with the manufacturing of materials. Rigorous standards address the manufacturing of steel pipe, valves and other components. Quality control inspections are conducted throughout the manufacturing process to ensure the materials meet the industry’s high standards. After coating is applied to the pipe joints at the mill, it is carefully inspected to ensure there are no defects in the pipe. Once delivered to the construction site, the pipe is inspected again for any damage or imperfections that may have occurred during the transportation process. After the welding process joins the sections of pipe, an electronic device with a spring-like collar is moved up and down the pipe to inspect for coating imperfections. This process is commonly referred to as “jeeping” the pipe.

During the construction process, a trench is dug to accommodate the pipeline. Special care is taken to ensure rock or any other materials in the trench are removed so that the coating of the pipe is protected during installation and operation. After sections of the pipeline are tied together, the pipeline is then strength tested to demonstrate its mechanical integrity. Hydrostatic testing is the most common method, in which water is pumped into the pipeline and pressurized to a pre-determined test pressure for a specific period of time. In some cases, internal inspection devices are also passed through the pipeline to validate the quality of the construction process.

After the pipeline is installed and the trench has been filled in, the right-of-way is restored through grading and re-vegetation. One of the final steps is the installation of pipeline markers which serves as notification to our neighbors that a pipeline is operating in the vicinity. As part of the on-going pipeline public awareness programs, our neighbors along the right-of-way receive periodic communications concerning operations, safety, damage prevention, and steps to follow in the unlikely event of an emergency. These communications also are provided to emergency responders, public officials, and those that conduct excavation activities.