Pipeline Emergency Response Tactics: Tips for Responding to a Terminal Incident

Effective and safe emergency response to a storage terminal emergency requires rapid identification of the material or materials involved, an understanding of how specific products behave under various circumstances and coordinated response efforts.

After liquid petroleum products are delivered from a pipeline, they are temporarily stored in aboveground facilities, called marketing and distribution terminals, before being transferred into cargo tank trucks, rail cars or barges to be taken to the end user.

A variety of liquids products can be stored in tanks at terminal facilities including: crude oils; refined products such as gasoline, aviation gasoline, distillate fuel oils and jet fuel; and liquefied gases such as anhydrous ammonia, liquefied petroleum gas and carbon dioxide.

Aboveground storage tanks vary in size and design and are differentiated by their roof type and orientation: cone or flat roof tank, covered floating roof tank, open floating roof tank, open floating roof tank with geodesic dome, vertical storage tank and horizontal storage tank. Each tank shape has unique safety benefits for certain products; therefore, the type of storage tank used to house flammable and combustible liquids is determined by the physical characteristics of the product being stored and the location and orientation of the tank.

Combustible liquids, such as distillate fuels, are typically stored in large cone roof tanks or in smaller low-pressure vertical or horizontal tanks. Gasoline and other flammable liquids with flash points less than 100°F are usually stored in open-top or covered floating roof tanks.

In addition to careful facility design and maintenance, terminal personnel follow policies and procedures such as hot work permitting policies and regular site walkthroughs to prevent and identify potential emergencies. Terminal facilities typically include strategically located spill kits or trailers that contain quick response tools, equipment and materials needed to respond to a product spill. In addition, each facility maintains fire prevention and emergency action plans that address a variety of potential emergency situations, including surface tank fires and confined space rescue.

Depending on the terminal location and products transported, operators often have personnel on-site or contract resources available that are trained and equipped to respond to storage facility emergencies.

Pipeline Emergency Preparedness & Training: Developing an Incident Action Plan

The National Incident Management System (NIMS), developed by the Department of Homeland Security, provides a structured framework for managing incidents that can be used regardless of cause, size, location or complexity. The cornerstone of NIMS is the Incident Command System (ICS) and its process for Incident Action Planning.

An Incident Action Plan (IAP) includes the overall incident objectives and strategies. IAPs are established by the Incident Command (or Unified Command) and help ensure that everyone works cohesively toward the same goals by outlining and communicating measurable objectives for both operational and support activities for a specific operational period, typically 12 or 24 hours.

A written IAP for pipeline emergencies is suggested because pipeline emergencies may require resources from multiple agencies, can span several operational periods and require documentation of actions and decisions. In addition, a pipeline incident may result in the release of hazardous (continued on page 2)
execute defensive Hazardous Waste Operations & Emergency Response (HAZWOPER) procedures and provide medical first response.

Listed below is a recommended process for emergency responders arriving at the scene of a terminal emergency.

Steps for responding to a terminal emergency:

1. Assess the situation
   - Approach with caution from an upwind location
   - Employ ICS
   - Identify and contact the terminal operator using the emergency number located on signage

2. Protect people, property & the environment
   - Establish isolation perimeter and hazard zones (hot, warm and cold) and set up barriers
   - Rescue and evacuate people, if necessary
   - Eliminate all ignition sources
   - Stage apparatus and equipment based on atmospheric monitoring and weather conditions
   - Use appropriate defensive Hazardous Waste Operations & Emergency Response (HAZWOPER) procedures such as installing dikes and dams, if trained and equipped
   - Control fires, vapors and leaks. Do not extinguish burning fires. Protect exposures and coordinate isolation operations with pipeline personnel
   - Employ containment techniques if personnel are trained, equipped and it is safe to do so

3. Call for assistance as needed
   - Contact other local emergency response organization and/or national resources, if needed

Emergency responders are encouraged to contact their local terminal operations representative to discuss the terminal’s internal response capabilities and to review the local emergency response plan. For more information about Kinder Morgan’s terminal operations in your jurisdiction, contact your local Kinder Morgan representative or visit http://PA-InfoRequest.kindermorgan.com. You can also read more about Kinder Morgan’s terminal operations on our website.

To learn more about storage terminals and their specific response needs, refer to Storage Tank Emergencies: Guidelines and Procedures by Michael S. Hildebrand and Gregory G. Noll. To purchase Storage Tank Emergencies: Guidelines and Procedures, call (800) 654-4055 or e-mail customer.service@osufpp.org.

Information about responding to a terminal emergency is also included in the “Pipeline Emergencies Training Program” developed by the National Association of State Fire Marshals (NASFM) and the Pipeline & Hazardous Materials Safety Administration (PHMSA). Visit http://pipeline.mindgrabmedia.com/main.aspx to order a free copy or access online training.

materials jurisdictional under OSHA 1910.120 (HAZWOPER) which requires use of ICS and implementation of a written IAP.

IAP creation and implementation typically involves the following five steps:

1. Understand the Situation
2. Establish Incident Objectives and Strategies
3. Write the IAP
4. Prepare and Disseminate the Plan
5. Evaluate and Revise the Plan

The “National Incident Management System (NIMS) Incident Command System (ICS) Forms Booklet, FEMA 502-2” is currently under regulatory comment and review. The booklet contains forms designed to assist emergency response personnel in the use of ICS and the creation of IAPs. The following forms are typically included in pipeline emergency IAPs:

**Incident Objectives**

The Planning Section Chief typically prepares the incident objectives during a meeting with the responsible party’s Incident Commander and federal, state and local on-scene coordinators. This form describes the basic incident strategy, incident objectives, command emphasis/priorities and safety considerations for use during the specified operational period.

**Organization Assignment List**

The organization assignment list is typically prepared by the Resource Unit Leader and provides ICS personnel with information on the units that are currently activated and the names of personnel staffing each position/unit.

**Assignment List**

The assignment list is typically prepared by the Resource Unit Leader and Operations Section Chief to inform Division and Group supervisors of incident assignments.
Overview of Pipeline Systems: Terminal Operations

Terminals, like those operated by Kinder Morgan, interconnect with pipelines and transfer energy products to and from tank ships, tank barges, pipelines, cargo tank trucks and rail cars.

Terminal operations utilize a complex system of checks and balances to ensure that products move safely from pipeline to storage terminal and to other transportation methods in route to its final destination. Transfer and storage operations include:

**Preparing to receive the shipment**
This process includes verification that there is sufficient storage space available and preparation for product sampling.

**Moving the product from the pipeline or other transportation modes into the receiving storage tank**
The storage facility follows standard operating procedures for valve alignments or lineups required to move the product from the pipeline, through the terminal’s piping system and into the receiving storage tank. Liquid petroleum products are typically stored in aboveground storage tanks, which are often referred to, en masse, as a “tank farm”.

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**Incident Radio Communications Plan**
The incident radio communications plan is typically prepared by the Communications Unit Leader and provides information on all radio frequency or trunked radio system talkgroup assignments for each operational period. Contact lists, including cell numbers for key personnel, should be included as well. A summary of this plan is provided to responders.

**Medical Plan**
The medical plan is typically prepared by the Medical Unit Leader and reviewed by the Safety Officer. The medical plan provides information on incident medical aid stations, transportation services, hospitals and medical emergency procedures.

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Transferring product from tank to loading rack or other transportation mode

Once the product is ready to be moved out of the storage terminal, a system of pipe and transfer pumps move the product within the tank terminal to a loading rack.

Transferring product from loading rack to tank truck, rail car, ship or barge for delivery to the end user

A bottom-loading rack is the most common method of loading cargo tank trucks and is used for the transfer of flammable liquids. Top-loading racks are primarily used for the transfer of combustible liquids and low-vapor pressure products, such as fuel oils and distillates.

Kinder Morgan is the largest independent terminal operator in North America. The company has 180 liquids terminals in 29 U.S. states and two Canadian provinces that store and transfer petroleum products, chemicals, coal, petroleum coke and steel products. Kinder Morgan’s North American terminals are located in:

- Alabama
- Arizona
- Arkansas
- California
- Colorado
- Florida
- Georgia
- Illinois
- Kentucky
- Louisiana
- Maryland
- Minnesota
- Mississippi
- Missouri
- Nevada
- New Jersey
- New York
- North Carolina
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- South Carolina
- Tennessee
- Texas
- Virginia
- Washington
- West Virginia
- Wisconsin
- Edmonton, Alberta
- Vancouver, British Columbia

Terminal operators work diligently to ensure safety. Operators follow detailed safety plans, policies and procedures to prevent and identify potential emergencies and train employees in tactical response skills including HAZMAT techniques, medical first response and confined space rescue.

Tanks and equipment are visually inspected to identify any signs of corrosion or other potential issues. Operators conduct walkthroughs and regularly test on-site equipment, including sprinkler systems, fire alarms, foam systems (where installed) and fire extinguishers.

Each Kinder Morgan terminal facility maintains a fire prevention and emergency action plan that addresses a variety of potential emergency situations. For more information about Kinder Morgan’s terminal operations in your jurisdiction, including terminal response capabilities and additional emergency response information, contact your local Kinder Morgan representative or visit http://PA-InfoRequest.kindermorgan.com. You can also download a map that shows the location of Kinder Morgan’s terminal operations at www.kindermorgan.com/asset_map/KM_System_Map_B_12-4-09.pdf.

Keeping Pipelines Safe: Pipeline Maintenance Activities

Pipeline operators actively monitor pipelines and aboveground facilities using field data, aerial inspections and foot patrols. Additionally, they implement the following safety procedures and protocols to help keep pipelines safe:

An IAP for a pipeline emergency may also include a communication list that records methods of contact for response personnel and a safety message/plan that expands existing safety messages and site safety plan details. The Communication Unit Leader typically prepares the communication list, and the Safety Officer typically prepares the safety message/plan.

Download the “National Incident Management System (NIMS) Incident Command System (ICS) Forms Booklet, FEMA 502-2” booklet by visiting www.regulations.gov/search/Regs/home.html#documentDetail?R=0900006480a6c11a. The most recent version of the forms booklet, which includes new and updated templates, is currently under review and is not yet authorized for use.

Kinder Morgan personnel who respond to emergencies are trained in NIMS and ICS to better assist emergency responders during a pipeline incident. Visit www.kindermorgan.com/public_awareness/Government to find additional resources for emergency responders.
Valve Maintenance

Valves help control the flow of product along a pipeline, as well as maintain a satisfactory pressure level. Pipeline operators maintain valves by implementing a maintenance and lubrication schedule and routine inspection of valves.

Cathodic Protection Maintenance and Testing

Cathodic protection is a technique used to control corrosion of a metal surface. Steel corrosion occurs when three conditions are met: (1) there are two dissimilar metals, (2) an electrolyte (water with salt) is present, and (3) a metal conductive path occurs between two metals.

Through cathodic protection, the surface of the pipeline is made a cathode, which prevents corrosion by controlling the polarity of the metals present. Pipeline operators regularly maintain and test the efficiency of a pipeline’s cathodic protection.

Pressure Limiting and Regulating Station Inspections and Testing

Pressure limiting and regulating devices are located along the pipeline to keep pressure at designated levels for safe product transportation within the line. Pipeline companies are required to inspect and test each limiting station, relief device and pressure regulation station at least every calendar year not to exceed 15 months.

ROW Maintenance (Mowing, Markers & Side-trimming)

A pipeline right-of-way is the land over and around the pipeline. Operators periodically clear the right-of-way, including side-trimming trees, to protect the pipeline from damage and to enable preventative maintenance measures, including visual inspections. It is important to remember that pipelines are not necessarily placed in the center of a right-of-way. Typically the pipeline is off-set to allow for initial construction and maintenance.

Unauthorized building, planting, digging or driving in a right-of-way can endanger the pipeline. Emergency responders can help keep pipelines safe by reporting right-of-way encroachments to Kinder Morgan at www.kindermorgan.com/public_awareness/AdditionalInformation.

Leak Surveys

Leak surveys are conducted along the pipeline right-of-way using gas detection equipment such as combustible gas indicators, laser methane detectors and flame ionization detectors. These surveys can be conducted by foot patrol, vehicles and even aircraft. This equipment allows pipeline operators to locate and identify potential sources of leaks. If leaks are identified they are promptly investigated.

If you would like to know more about Kinder Morgan’s pipeline maintenance activities in your jurisdiction, contact your local Kinder Morgan representative or visit www.kindermorgan.com/public_awareness/AdditionalInformation/RequestAdditionalInformation.cfm.

Link to download MSDS from KM PA Web Site

A Material Safety Data Sheet (MSDS) is a technical reference document that typically includes a product’s physical data. Kinder Morgan provides downloadable MSDS forms for natural gas and other products online at www.kindermorgan.com/public_awareness/AdditionalInformation/msds/default.cfm.


Best Practices

“Tabletop exercises are valuable along with pipeline routes and any changes in procedure.”

Lincoln Fire & Rescue, Lincoln, Nebraska

“Rusk County, Texas has regularly scheduled safety meetings on pipeline safety.”

Emergency Operations Center, Rusk County, Texas

“We attend SIPA meetings and ensure brochures supplied are distributed to EMA personnel.”

Fayette County Emergency Management Agency, Fayette County, Illinois

“[We are] aware of pipeline emergency contacts. [We host] annual training in IMS/ICS [and] attend annual meetings sponsored by pipeline and utility companies.”

Union Colony Fire Rescue, Greeley, Colorado

“We hold monthly meetings and go over reports that we get from oil and gas companies. We have tabletop drills with our county fire departments.”

Karnes County, Texas