Glen Riddle Station, L.P., v. Sunoco Pipeline, L.P.,	Docket No.: C-2020-3023129
Telephonic Evidentiary Hearing	

Pages 1 - 119

Judges Chambers
400 North Street
Harrisburg, PA 17120

Wednesday, July 7, 2021
Commencing at 9:00 a.m.

INDEX TO EXHIBITS

NUMBER

For the Complainant:

Noll Cross Examination Exhibits:

1 9/25/20 Energy Transfer Article

2 Final Report for Transportation Research Board of National Academies of Sciences

3 6 Page FDIC 2019 Quick Take: Hazmat Incidents and Figure Skating (NOT ADMITTED)

4 Fire Protection Handbook (SENT TO BUREAU ON FLASH DRIVE-UNABLE TO ATTACH)

For the Respondent:

SPLP Statement Number Exhibits:

1-R Prefiled Rebuttal Testimony of Gregory G. Noll

NUMBER

GN Exhibits:

GN-1 Gregory G. Noll
Curriculum Vitae

GN-2 Aerial Photos

GN-3 Aerial Photo

GN-4 Aerial Photo

GN-5 12/8/20 Letter

GN-6 Memorandum

GN-7 Document

ENERGY TRANSFER

The Value in First Responder Pipeline Safety Trainings

Sep 25, 2020 | Blog

By Greg Noll, Emergency Response Training Consultant

Building relationships between emergency planners and first responders is critical in any community, and especially related to hazardous materials. This has been an integral part of my career as both a first responder and a hazardous materials emergency response instructor. With several millions of miles of pipelines across the United States, used to transport and deliver various energy products like refined petroleum products, natural gas liquids and crude oil, my instruction naturally includes response to potential pipeline incidents.

Noll 1
7/7/2021 LS

An important fact that is lost on many people, especially in this day and age, is just how safe pipelines are when compared to other modes of transportation used to deliver energy resources. The U.S. Department of Transportation continues to acknowledge pipelines as the safest mode of energy transportation, and each major pipeline, such as Mariner East 2, can take thousands of cargo tank trucks off the roads and tank cars off the railroads.

Pipeline operators work with first responders in the communities where they operate to organize trainings, tabletop exercises, facility tours and other events to prepare for the rare event of an incident. Energy Transfer and Sunoco Pipeline have always prioritized this and have thus built close relationships with first responders where they operate. I know this firsthand as I have been involved in this process since 2017.

The Mariner Emergency Responder Outreach (MERO) Program was developed in 2013 to provide emergency responder training on responding to NGL incidents along the Mariner East and West

rights-of-way and in the communities surrounding the pipelines. Preparedness activities have included providing emergency responder training, hosting tours of facilities and assets, sending public information mailers, participating in other community events and sharing information about projects with those who are interested.

Based on my background as both a first responder and instructor in hazardous materials emergency response, Energy Transfer tapped me in 2017 to deliver the MERO Pipeline Emergencies training sessions in Pennsylvania, Ohio, and West Virginia. As of this date we have trained more than 2,540 first responders across the Mariners East and West. We are currently in the middle of another round of MERO trainings, and I am enjoying the opportunity to teach this valuable material to even more emergency responders.

First responders already have Awareness and Operations-level training in hazardous materials emergency response. The MERO training builds upon that base and complements their hazmat training by focusing upon pipeline issues and topics, such as the types of pipelines and their operations (e.g., gathering, distribution, transmission), their location within the community, the physical and chemical properties of the products being transported, and the application of a risk-based response process for managing various pipeline incident scenarios should an incident occur.

The MERO curriculum is based upon the *Pipeline Emergencies* (PE) textbook published by the National Association of State Fire Marshals (NASFM). As one of the co-authors of the PE textbook, the textbook has significant third-party review with over 30 technical reviewers representing both the fire service and the

pipeline industry. As we say, it's written by emergency responders, for emergency responders. Now in its third edition, we continue to update the textbook based on new and relevant information, as well as to refresh our pipeline safety trainings.

As a student of leadership, one of my favorite things to do at each session is to give a shout-out to the "most experienced" (oldest) first responder in the room and introduce them to the youngest and newest. Besides hopefully starting a mentorship between them, the session provides them with the technical information to "make a difference" should an incident occur.

In closing, I have an agenda in being part of the MERO Program – to keep emergency responders and their communities safe in the event of a pipeline incident. I am honored to play a role in the education of thousands of first responders, and therefore the safety in all of the communities they serve. I hope people keep in mind that pipelines are by far the safest way to transport energy, and incidents are very rare. Rest assured that your local emergency responders are educated and prepared to respond in such a case, and ready to protect and serve.

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Greg Noll has facilitated MERO trainings across his home state of Pennsylvania for the last four years. With nearly 50 years of experience as a first responder in the fire service, Noll has instructed responders worldwide and is a technical specialist in emergency response to hazardous materials incidents. He has authored numerous books and articles that are used by first responders, including the widely used textbooks Pipeline Emergencies (3rd edition) and Hazardous Materials: Managing the Incident (4th edition).

Noll currently serves as Senior Planning Specialist – Special Projects for the South-Central PA Regional Task Force. He is also a principal with GGN Technical Resources, LLC, a consulting firm specializing in emergency planning, response and incident management issues, and sits on numerous national-level boards and committees pertaining to hazardous materials emergency response. He is a retired member of the U.S. Air Force Reserve with more than 29 years of service, having served as a subject matter expert for various U.S. Department of Defense hazardous materials and counter-terrorism response training programs.

In 2011, Greg was honored by the International Association of Fire Chiefs (IAFC) as the recipient of the John M. Eversole Lifetime Achievement Award for his leadership and contributions to further enhance the hazardous materials emergency response profession. Noll was subsequently inducted into the National Fire Heritage Center's Hall of Legends, Legacies and Leaders in April 2019.

Topic

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GUIDE FOR COMMUNICATING EMERGENCY RESPONSE INFORMATION FOR NATURAL GAS AND HAZARDOUS LIQUID PIPELINES

FINAL REPORT

Prepared for HMCRP
Transportation Research Board
of
The National Academies

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CHAPTER 1

Background

Communication at pipeline emergency incidents can be complex, and include multiple relational components, which leave significant room for errors to occur during an emergency response. Each of the parties plays an important role, and the effectiveness of communication between and within the roles is crucial to the successful response to a pipeline emergency. Over the past two decades there have been over thirty critical incidents involving pipelines in the United States alone. Collectively they resulted in 84 fatalities, 630 injuries, and losses in excess of $1.1 Billion (2012 dollars).

The research described in this report focused on communications during pipeline emergencies, specifically, on the content of those communications and where deficiencies in communication are likely to occur. We conducted a literature review of incident reports to determine key communication failures that occur during emergency response. In addition, we used three methods to empirically examine the content of emergency communications: (1) a situation awareness information analysis; (2) an information flow analysis; and (3) a failure modes and effects analysis.

This chapter provides a basic understanding of different types of pipelines, emergencies related to those types of pipelines and the importance of communications during those emergencies. In addition to describing the basic characteristics of pipelines, this chapter also reviews relevant federal and state regulations.

Selected Characteristics of Pipelines

Minor pipeline emergencies occur frequently and are handled safely and effectively by the emergency response community. However, there are also pipeline emergency scenarios, such as those involving transmission pipelines that have the potential to quickly escalate to a high consequence event. As low frequency / high consequence events, first responders and pipeline operators are sometimes not fully prepared or cognizant of the effort necessary or procedures needed to successfully respond to this type of incident (Hall, Butters and Armstrong 2012). Pipeline emergencies can be inherently complex events, requiring the coordination of multiple response agencies and organizations representing private and public entities, and having both short-term and long-term impacts that go well beyond the response phase of the incident.

Analysis of past pipeline incidents has shown that communication in the first critical minutes of an event - most often communication between emergency responders and pipeline operators – is critical to determining the outcome of an incident. Incomplete, inadequate, or unclear communication can result in a delayed response and can contribute to excess release of hazardous substances into the environment, excess property damage, and human casualties.

Examples of challenges to communications include failure to recognize the potential involvement of a pipeline in a release scenario, inability to identify the product(s) that are being released, and not knowing when or who to notify to respond to the leak.

About Pipelines

Pipelines are a highly efficient means for moving large quantities of both liquid and gas hazardous materials. An estimated 70 percent of petroleum products travel via pipeline (Association of Oil Pipe Lines 2012). As such, pipelines are a crucial component of America's energy system. Although certain parts of the country have greater concentrations of pipelines, the overall mileage of pipelines is extensive and touches nearly every state. Table 1-1 shows data on pipeline mileage by type of pipeline. The greatest mileage is found in natural gas distribution lines, which are used to deliver this product directly to consumers. Oil and hazardous liquid pipelines account for just over 185,000 miles of the 2.6 million miles of pipelines in the United States.

Table 1-1. Types of Pipelines and Mileage (2012)

Type of Pipeline	Mileage	Total
Hazardous Liquid	185,425	185,425
Natural Gas (Gathering)	16,288	
Natural Gas (Transmission)	302,776	
Natural Gas Gathering and Transmission Total		319,064
Natural Gas (Distribution Mains)	1,246,248	
Natural Gas (Distribution Service Lines)	891,954	
Natural Gas Distribution Total		2,138,202
Grand Total		**2,642,691**

Source: Pipeline and Hazardous Materials Safety Administration (http://phmsa.dot.gov/portal/site/PHMSA/menuitem.7c371785a639f2e55cf2031050248a0c/?vgnextoid=3b6c03347e4d8210VgnVCM1000001ecb7898RCRD&vgnextchannel=3b6c03347e4d8210VgnVCM1000001ecb7898RCRD&vgnextfmt=print)

Types of Pipelines: Product and Function

While all pipelines have commonalities, they can be classified by either function or by the product(s) they are designed to carry. In this chapter we provide a high-level overview which explains the differences in pipelines.

Pipelines by Function

Pipelines can be classified according to their function. An illustration of different pipeline functions is included Figures 1-1 and 1-2.

Gathering – gathering pipelines exist to transport raw, unprocessed product from the point of production to a storage facility. Storage facilities may receive shipments from multiple gathering pipelines. The shipments are then stored in tanks. Gathering pipelines may be owned by producers of the product. Gathering pipelines can be found transporting crude oil, natural gas and natural gas liquids from multiple production sites to regional storage facilities.

Transmission – transmission pipelines move raw, unprocessed product from storage facilities to refining or processing facilities. Transmission lines tend to be large and cover longer distances. These lines also move product from refining or processing facilities to storage facilities located near customers. Indeed, some transmission pipelines traverse the entire continent. Transmission lines, especially those covering long distances, are often owned by specialized companies whose sole function is the operation of these specialized components of the pipeline infrastructure. Transmission pipelines are of larger diameter, and have greater flows and pressures than other types of pipelines. Because of this, they have the potential for greater consequences during a leak.

Distribution – distribution pipelines are unique to natural gas systems. Distribution pipelines are used to connect the source of product from the transmission line, to end-users or customers. Distribution lines have the smallest diameter. While distribution lines are more frequently involved with leaks, the consequences are more limited. Because they tend to be in populated areas, they may be more likely to threaten structures and people.

Responses to incidents at transmission and distribution pipelines differ significantly. Depending upon the response scenario, the differing operating environments and characteristics of each can have an effect on communications needs and entities involved in responding to a pipeline emergency.

Pipelines by Product Carried

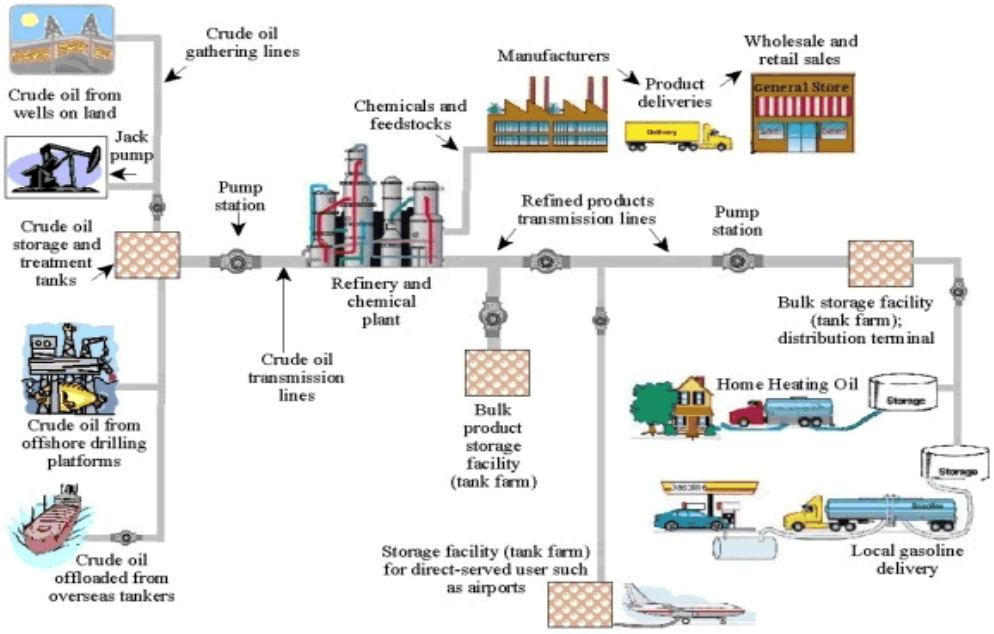
Although pipelines have many common characteristics, an important distinction is based upon the products that they are designed to carry. Different products require different pipeline operating processes and characteristics. The physical characteristics of gases versus liquids will determine operating pressures and flow characteristics. These differences ultimately affect pipeline design and operations. That is, a pipeline designed to carry natural gas would typically not be able to carry a liquid such as crude oil or refined products. However, the same liquid pipeline may be used for multiple liquid products. For example a pipeline from an oil refinery to a distant storage tank distribution facility can be used to send different grades of gasoline, diesel fuel, or heating oil. With the recent expansion of the petroleum industry into new geographic areas of North America, discussions are also taking place on possibly reversing the historical flow of pipeline operations. For example, product that historically flowed from south to north are now being reviewed to flow from north to south.

Shipments through a liquid pipeline are referred to as “batch” systems because different grades or types of product may be shipped through the same pipeline at different times in so-called batches. The mixing that occurs between different grades of product is known as ”transmix.” Depending on the nature of the product and its end-use, the transmix may be subject to additional treatment before being sold or may be mixed with one of the adjacent products of the pipeline. For example a premium gasoline transmix with

regular, where the transmix would be combined with the regular gasoline (Meisner and Leffler 2006, 71-72).

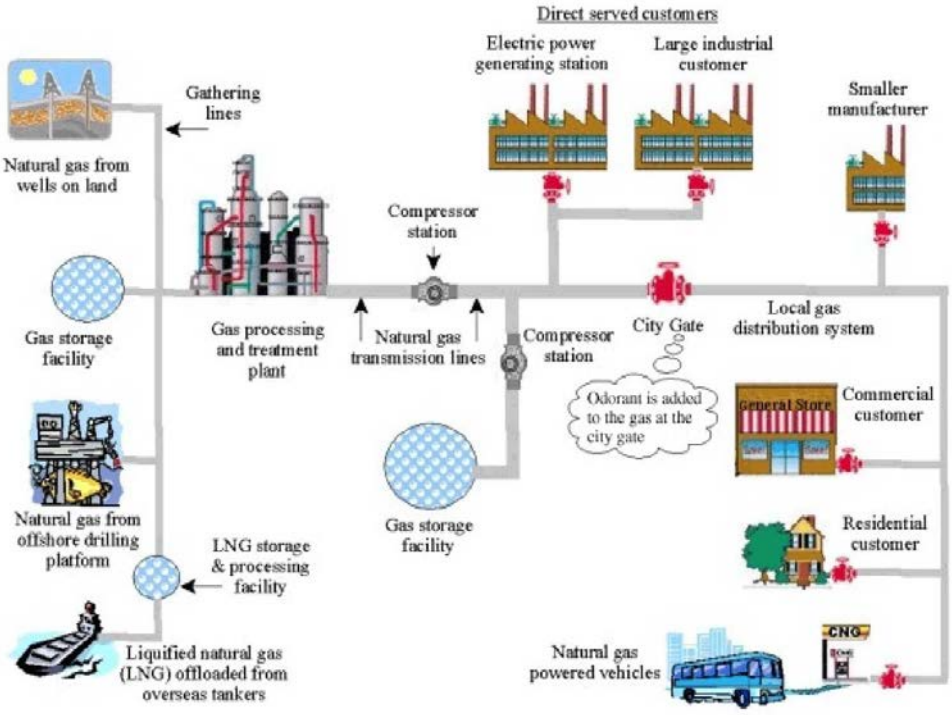
Characteristics of Pipeline Systems

Figures 1-1 and 1-2 provide the layout and overview of petroleum product and natural gas pipeline systems respectively. Both diagrams move from production on the left to consumption on the right. The raw material is produced, either from wells or introduced to the system from a tanker or other external source. From there, the material is stored and may undergo some basic processing to remove contaminants. Next, the product enters the transmission line and goes either to a refinery or processing plant. From there the product moves out to the transmission line. Along the line, the product is kept moving either through pumps (liquid lines) or compressors (natural gas) located along the route. Large volume customers may access product directly from the transmission line, but most users receive the product from a storage tank distribution facility for liquid pipelines. For natural gas pipelines, customers receive product through the local distribution pipeline system, usually operated by a local utility.



Source: PHMSA "Petroleum Pipeline Systems"
http://primis.phmsa.dot.gov/comm/PetroleumPipelineSystems.htm?nocache=6756

Figure 1-1. Petroleum Pipeline Systems Overview



Source" PHMSA "Natural Gas Pipeline Systems"
http://primis.phmsa.dot.gov/comm/NaturalGasPipelineSystems.htm?nocache=464
Figure 1-2. Natural Gas Pipeline Systems Overview

Pipeline Operations

Pipeline operations are highly specialized and overseen by personnel working throughout the system. While maintenance personnel and limited operations staff work in the field, most control operations are centralized at the pipeline's "control room."

Control rooms oversee routine and emergency operations of the pipeline. While many functions used to rely on personnel located in the field to perform readings, monitor equipment, and open and close valves; many of these functions are now done remotely from a centralized control room using sophisticated monitoring and operation systems and software.

Supervisory control and data acquisition systems (SCADA) describe a distributed network of sensors and associated controls. These systems monitor the status of gates and vales, flow of product, pressures, and other operating characteristics. These SCADA systems for pipelines are extensive and automate many functions of pipeline operation.

The flow of product through a pipeline is also tracked through complicated analytic systems that perform *computational pipeline monitoring (CPM).* These systems use sensors to compare pipeline flows at various stages along the pipeline and attempt to reconcile differences in flow across these locations.

Control room personnel rely on SCADA and CPM systems to monitor the status of the pipeline and detect abnormal conditions. The highest priority is to identify a leak or unsafe condition as quickly as

possible. In many cases, the control room operators must interpret multiple sources of information to infer that a leak has occurred. Reports from field personnel, the public, or emergency responders can help speed up this process.

Even when a leak is detected, the proper valve or valves must be closed. All valves are not capable of being remotely operated which may require field personnel to drive to a location and manually operate valves. Even after valves are closed, the flow of residual product may continue for some time.

Although extensive technology is in place to monitor pipeline operations and identify leaks along the pipeline, depending on the pipeline size, location, and product involved, it may be difficult to initially detect a leak or its specific location. According to PHMSA data, a significant percentage of pipeline leaks are discovered by the public or emergency responders (after a report from the public) (U.S. Department of Transportation, "Leak Detection Study" 2012).

For a more complete introduction to pipelines and operational concerns of emergency response refer to *Pipeline Emergencies, Second Edition*, available free of charge online and as a downloadable smart phone "app" via the National Association of State Fire Marshals and US Department of Transportation at http://www.pipelineemergencies.com (Noll and Hildebrand 2004).

Federal, State and Local Roles

Responsibility for pipeline safety and emergency planning oversight is shared by federal, state and tribal authorities. Federal pipeline regulations have specific emergency planning mandates that include written emergency response procedures and the requirement for communication of emergency plans and procedures to fire, police, and other government officials.

Federal regulations provide national requirements that all entities must abide by, however pipeline regulation and inspection is performed at the state level via authorized entities in each of the fifty states. Most states have adopted federal pipeline safety regulations, and some have a contract with PHMSA whereby they agree to follow and enforce these regulations.

Federal regulations

Federal regulations require emergency plans and response procedures, such as: (Code of Federal Regulations (CFR 2012, Titles 30, 40 and 49).

- Notification of appropriate fire, police, and other public officials and coordinating response
- Controller emergency procedures
- Evacuation plans for pipeline facilities must be coordinated with local officials
- Disclosure of hazards, layout of facilities, and quantities of materials present

Regulations that are generally adopted nationwide are the PHMSA issued federal advisory (Docket No. HMSA-2012-0201) require pipeline operators to contact the corresponding Public Safety Answering Point (PSAP) during a pipeline emergency. (U.S. Department of Transportation, "Communication During Emergency Situations," 2012). The large number of PSAPs potentially responsible for areas of a given pipeline make notification of the appropriate PSAP challenging. The pipeline operator would be

responsible for securing 10-digit direct-dial numbers for each PSAP along the route of its pipeline and have geo-referenced data to assist in identification of appropriate PSAPs in the event of an incident. This advisory was a result of the National Transportation Safety Board (NTSB) investigation of the San Bruno, CA gas pipeline rupture and explosion on September 9, 2010 (NTSB, "*Pipeline Accident Report. Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA,"* 2010). The National Emergency Number Association (NENA), an industry trade group for 9-1-1 system operators (PSAPs) developed a subscription based service to provide contact information for PSAPs mapped to pipeline routes shortly after this advisory was issued which helps to fill the information gap. (http://nenapipedb.com/).

Another federal regulation recently established is the *Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011*, which requires the Department of Transportation (DOT) to establish time limits for telephone or electronic notification of an event. This notification must be given within one hour or less to the DOT and the National Response Center (NRC), maintained by the US Coast Guard. The NRC then notifies relevant agencies involved in the response. DOT/NRC requires the following information to be included in the notification:

- Name of the operator
- Name of the person making the report
- Telephone number of the person making the report
- Location of the incident
- Number of fatalities and injuries

Revision of initial telephonic or electronic notice to the NRC is required within 48 hours regarding *the amount of product released* and the *number of fatalities and injuries* and any other significant changes. Finally, the U.S. Government Accountability Office (GAO) recently provided testimony before the Senate suggesting that performance criteria for pipeline operators to arrive at incidents should be developed. (Fleming 2013). These recent developments suggest that refinements to pipeline emergency response are recognized as a concern by both the legislative and executive branches of the federal government.

State regulations

While all States regulate pipelines, these requirements often do not specify emergency communication methods or content of messages. Thirteen states have additional communication-specific emergency planning or response requirements in place, such as:

- Notification of appropriate local emergency response agencies
- Annual meetings with fire departments
- Cooperate with training of local responders
- Notification to schools located within 1,000 feet of a pipeline
- Disclosure of products transported
- Designated emergency number for the pipeline operator and information on excavation notification and procedure to follow in the event of a leak.

Some states have additional requirements, however, only some of these requirements pertain directly to emergency response. For the most part, these state notification requirements are not well-defined, standardized or specific with regard to how notifications shall occur. See Appendix C for enhanced reporting requirements.

The Critical Role of Public Safety Emergency Communications (PSAP/9-1-1) Centers

One of the most important functions that must be performed in a pipeline emergency is to coordinate the flow of information at an incident. Most commonly, in the early stages of an incident, this will involve transmitting information from responders in the field to pipeline operators. In most cases, the information flow is mediated by the public safety dispatch facility. This critical linkage between pipeline operators and the emergency response community is not always recognized and acknowledged. The role of the public safety dispatcher or call taker is thus crucial to the process of communications.

There are a number of technologies that may be used to facilitate the exchange of information between organizations responding to a reported pipeline emergency. The most common technologies are:

- Telephone
- Radio
- Computer/Electronic Data Exchange

The information flow analysis can be used to identify the exact technologies used to exchange information between emergency responders and pipeline operators. In most cases pipeline operators must rely on telephone communication to speak to first responders. As stated previously, although telephone communications are the most common, other technologies may be usable with prior training. Advances in 9-1-1system technology, the widespread use of computer aided dispatch systems by public emergency responders, and greater availability of computers with wireless connectivity in the field will all offer opportunities for greater connectivity in the future. Regardless of the technologies used, the most likely failure modes should be identified. Technology should be in good working order and alternative technologies and redundant modes of communication should be available as well in the event that the most commonly used one is not available. Responders should have a good idea about what information they may need to request, and what information they may need to relay, as identified by using methods such as the situation awareness information requirements and information flow analyses.

Guidance Documents for Public Safety Communications Centers and Pipelines

Model Protocol for 9-1-1 Centers and Pipeline Emergencies

The National Emergency Number Association (NENA) publishes a model procedure known as the “Pipeline Emergency Operations Standard/Model Recommendation, Document 56-007” (NENA, 2010). This document provides a structured protocol for handling pipeline emergencies. The protocol requires that dispatch personnel be provided with information about physical signs of a pipeline release so that they can recognize a potential pipeline emergency based on equivocal or incomplete information that may be provided by lay personnel reporting an unusual situation to 9-1-1.

While the protocol advises 9-1-1 centers to be aware of pipeline companies and contact information in their service areas, the possible need to rely on identifying pipeline markers or calling 8-1-1 to reach the local “one call center” may be required to identify emergency contact information for the pipeline operator(s) in question. In addition, the procedure includes a listing of common pipeline leak indicators as they may be described by 9-1-1 callers. These indicators include smells, sounds, and visual indicators such as liquid pooling, dead vegetation, and frozen ground in the summer or a melted patch of snow in the winter. Also included in the protocol is information to determine if the caller is in danger and instructions to provide guidance under common scenarios depending on the nature of the hazard, distance from the leak, and physical indicators.

Immediate notification of the pipeline operator is indicated and the dispatcher is directed to obtain additional information on hazards near the location of the leak or spill as well as determine the response time and any actions to be taken by the pipeline operator.

NENA's Document 56-007 was jointly designed by pipeline operators, the American Petroleum Institute (API), and 9-1-1 Call Center personnel. The document can be downloaded from NENA's website at http://www.nena.org.

NENA Pipeline Database

In response to PHMSA Advisory Bulletin ADB 12-09, NENA established a pipeline database designed for use by pipeline operators in determining the appropriate PSAP (9-1-1 Center) along the route of a pipeline. The database provides a 10 digit direct-dial number to each of the PSAPs (9-1-1 Centers) along a pipeline route, and can also be used for identifying the appropriate PSAP for a given location.

Released in October 2012, the PHMSA Advisory Bulletin reinforces PHMSA's intent that operators of gas, hazardous liquid, and liquefied natural gas pipelines should have the ability to make immediate contact with the appropriate PSAP located at any point along the route of their pipeline. The purpose of this communication is not only to advise emergency responders of a possible hazardous condition, but also to assist the pipeline operator in gathering first-hand observations made by callers to 9-1-1 centers or by on-scene emergency responders. Such information can be crucial to verifying a leak and reducing the amount of time before action is taken to close valves or otherwise isolate the problem.

NENA has long held a database of all the 9-1-1 centers in the U.S. This database, which was initially developed for interconnection between 9-1-1 centers and cell sector call routing, has been expanded to include 10-digit numbers for the call centers. These services are available on an annual license, with data updated quarterly (http://nenapipedb.com).

Pipeline operators or other users provide a list of counties in which they have facilities and the NENA database cross-references the list and creates a tabular database list of PSAPs based on locations along the pipeline route. This service is particularly valuable because many counties are served by multiple PSAPs, and the service area boundaries are not always apparent.

The use of an authoritative service such as that provided by NENA can be an efficient way for pipeline operators to maintain emergency reporting capabilities for local authorities.

The Planning Process

Characteristics of Effective Emergency Plans

Planning effort should involve all stakeholders to assure that key players are represented. We have already defined the minimum participation as the pipeline operator, public emergency responders, and public safety emergency communications agencies that serve the response agencies. In cases where multiple communication centers serve the set of agencies that would respond, a representative of each center should participate. This should include: a) the agency dispatch center(s); b) the public safety answering point (PSAP); c) and any communications center that receives wireless 9-1-1 calls. This assures that all centers that may handle any portion of the critical communications are included.

A systematic process should be used to address uncertainty around potential hazards and threats. For example, FEMA already requires states and many local jurisdictions to develop a Threat and Hazard Identification and Risk Assessment (THIRA) as part of its "all hazards" planning process. In the case of pipelines, variables such as the type and products carried by pipelines and their presence in sensitive locations should be considered.

Public emergency responders routinely plan and practice for a number of hazards, often under their jurisdiction's Emergency Management or Operations Plan. Planning for pipeline emergency communications should follow the same general steps, but we suggest some refinements in approach specific to this area. Incorporating pipeline emergencies into the jurisdiction's EOP has the benefit of having the support of the entire political jurisdiction and engaging other agencies beyond public emergency responders, who would play a role in responding to and mitigating a major pipeline emergency. Further, such an approach is consistent with FEMA's notion of 'whole community' planning (FEMA, "Comprehensive Preparedness Guide," 2010).

The mission and supporting goals of any plan should be specified clearly. While these may seem evident to public emergency response agencies, this stage of the planning process enables resource constraints to be identified, and roles to be made clear.

The planning process should have active participation of senior personnel from all participating agencies. Involvement of participants with the ability to speak for their organizations, make commitments, and resolve uncertainties are critical to the process.

FEMA identifies three levels of planning – strategic, operational, and tactical. Strategic planning sets overall policy objectives. Operational plans address roles, responsibilities, tasks, and action. The tactical level addresses personnel functions, equipment needs, and resource management. To be effective, the planning for emergency communication must reach down to the tactical level. Specific technologies for exchange of information, means of sharing information among all parties, and contacts for key individuals and offices must be established. See Appendix C.

An objective of this planning effort is to support the development of a common operating picture, whereby all entities involved have a shared and consistent understanding of not only where things are, but also where they are expected to go in the near term. Common operating picture describes having situation awareness among those agencies and organizations involved in the response to a pipeline emergency. The goal of the planning effort is to be able to achieve this common operating picture or situation awareness as quickly as possible after an incident is reported to any party.

To summarize, the planning for pipeline emergency communications should be consistent with emergency planning already practiced and embedded in the agency's larger process of developing Emergency Operations Plans. The planning effort is a process – the planning process should be integrated into organizing, training, exercises, and evaluation. Once completed it should be revisited to assure that it remains current and effective (Figure 1-3).

Source: Federal Emergency Management Agency
Figure 1-3. The Preparedness Cycle.

Managing the Incident: Unified Command and the EOC

Efforts to plan for communications and incorporate that information into emergency operations plans should be consistent with federal guidance on the National Incident Management System (NIMS) and the National Response Framework (NRF). The use of terminology and resource descriptions should be consistent with NIMS guidance. Although they are critical to understanding the need for planning communication for pipeline emergency response, the reader is referred to the national planning frameworks published by the US Department of Homeland Security. The national planning frameworks provide an overarching vision for the relationship between pre-event mitigation, emergency response, and recovery. The activities associated with planning for communications in pipeline emergency response would fall under the planning function of the National Mitigation Framework (U.S. Department of Homeland Security, "National Planning Frameworks," 2013).

The National Infrastructure Protection Plan (*NIPP)* is another resource designed to protect the Nation's critical infrastructure and key resources (CIKR). See http://www.dhs.gov/nipp for additional information. The CIKR Support Annex and Private-Sector Coordination Support Annex provide detailed guidance regarding implementation of the *NIPP*, including roles and responsibilities, concept of operations, and incident-related actions.

Incident and Unified Command

In the incident command function, a local public emergency responder, usually the ranking officer on scene from the most relevant public safety agency, will assume the role of incident commander. The incident command system (ICS) has the capability to integrate pipeline operator representatives as liaisons, where they can share information efficiently with the incident commander. This level of integration may be sufficient for smaller incidents of limited duration and commitment of resources.

However, for larger or more complex incidents, the concept of unified command brings together all critical agencies that play a crucial role in managing the incident. Organizations or agencies may be defined as candidates for participation in unified command based on provision of expertise, resources, jurisdiction or legal responsibility.

Unified command, in which on-scene command is shared by multiple agencies, is a method to recognize the multi-disciplinary nature of pipeline events, and the important role-played by other agencies such as law enforcement, human services, environmental protection, hazardous materials response teams, and the specialized expertise of pipeline operator responders. Implementing a unified command structure enables development of a single integrated incident organization.

In the early stages of an incident, communications between the pipeline operator and emergency responders is likely to be mediated by the public safety dispatcher, with such communications typically taking place over radio. When a pipeline company representative arrives at the scene of an incident, the primary means of communication shifts so that it is direct, usually face-to-face between the incident commander or a member of his staff and the pipeline company representative. Unified command would be implemented at this stage, assuming an ongoing incident.

Generally speaking, distribution pipelines, such as those operated by natural gas utilities, will have pipeline representatives on the scene of an incident sooner than transmission pipeline operators. This is due primarily to the more urban nature of distribution pipeline systems, and the long distances, which must be covered by transmission pipelines operators. Further, local emergency services are likely to have a more strongly established relationship with local pipeline operators because of proximity and the comparatively higher frequency of incidents occurring on natural gas distribution systems.

The Role of the Public EOC

Pipeline incidents can be complex events, requiring the response of multiple agencies from different disciplines and levels of government. Often, such incidents may affect multiple jurisdictions as well. The challenge of coordinating multiple, diverse agencies requires multi-agency planning and coordination.

As an incident escalates in terms of its scope or duration, a decision will likely be made to activate the local Emergency Operations Center (EOC). The local Emergency Operations Center may be activated on larger or longer duration incidents to assist in coordination, resource management, and fulfilling of functions. Functions include tracking resources, ordering specialized resources, and providing legal and financial support, such as executing contracts, and accounting for funds.

As a multi-agency coordination center, EOCs are designed to serve as a means to coordinate the flow of information among the incident scene and other agencies and support entities. EOCs bring together key decision makers to provide guidance and direction to support the on-scene incident management activities.

Interoperability and Controlling Communications Traffic

Communication during a pipeline emergency requires coordination with numerous government agencies and private companies. A mixture of technologies will undoubtedly be used by the various organizations that must interact to successfully resolve a pipeline emergency. Contact information and methods for communicating with pipeline operators with a presence in the community must be identified before an incident. Important steps to prepare for this task include:

- Documenting intra-agency communication technologies and procedures
- Identifying relevant organizations and agencies for notification and coordination
- Identifying preferred communications technologies and procedures for notification and coordination between these organizations

Needless to say, emergency responders should identify pipeline operators with facilities in their response area in advance of an incident. Additionally, state or federal agencies that would respond to a significant event should also be identified in advance, along with their contact information.

Interoperability

Interoperability is a concept that has received considerable attention in recent years. While interoperability can extend beyond communication we will use it to refer to the ability of different organizations to communicate directly through some technology accessible to all necessary participating organizations.

Interoperability is defined as: “the ability of emergency responders to work seamlessly with other systems or products without any special effort. Wireless communications interoperability specifically refers to the ability of emergency response officials to share information via voice and data signals on demand, in real time, when needed, and as authorized.” (U.S. Department of Homeland Security, “National Planning Frameworks,” 2013).

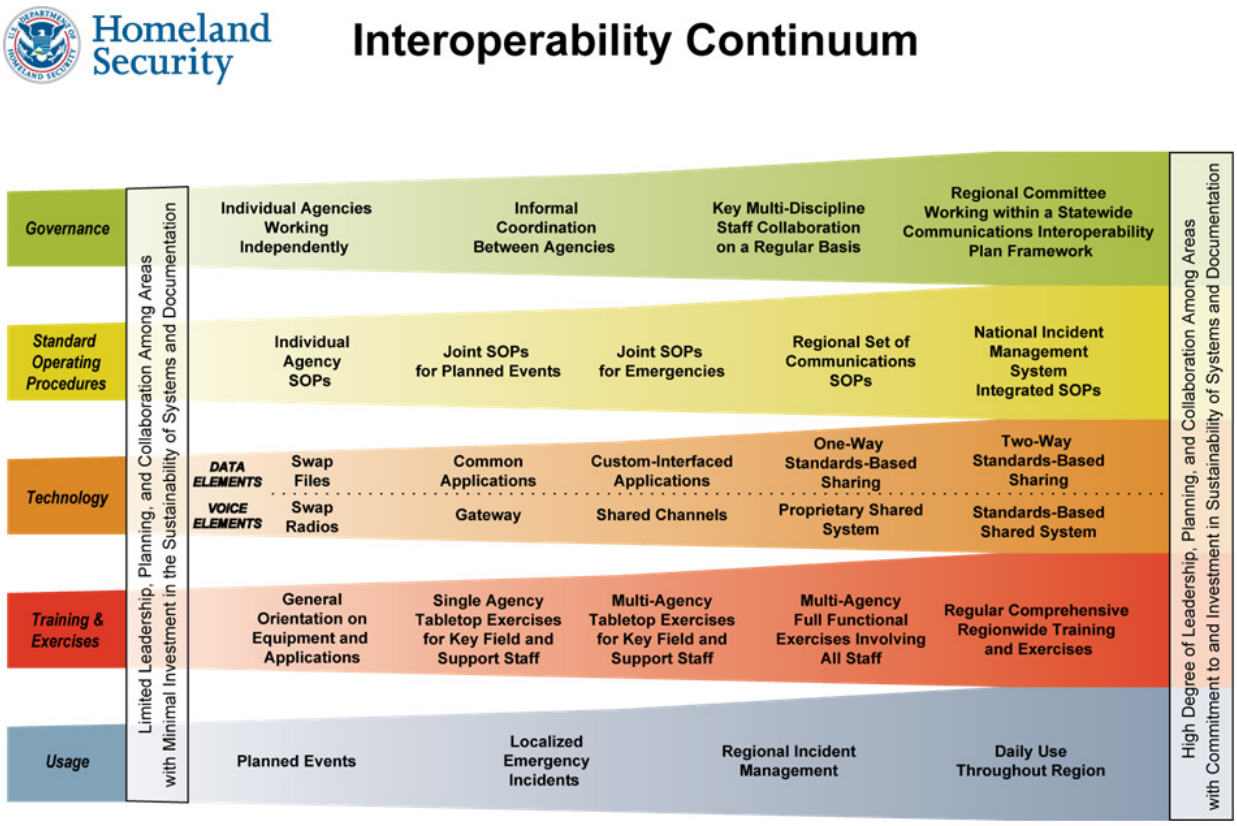
The concept of interoperability is important to pipeline emergency response because the dispatch center or EOC will fulfill a critical role and facilitate communication between personnel and equipment located at the scene of the incident and specialized resources including state, federal, and industry assets.

While interoperability is commonly thought of as involving voice radio communication, the concept applies also to the ability to communicate with data across disparate agencies. Figure 1-4 shows the interoperability continuum. This figure was developed by the US Department of Homeland Security's SAFECOM Office. While the diagram is elaborate, given the needs of emergency communication in pipeline events, it aids in understanding interoperability and its components.

We can examine the continuum by starting at the left-hand side, which represents the lowest level of integration and interoperability, and move progressively toward the right side of the presentation where we achieve higher levels of integration and interoperability. Interoperability as a concept is divided into five distinct components:

- Governance
- Standard operating procedures
- Technology
- Training and Exercises
- Usage

The continuum is a useful guide when envisioning communication strategies used during a prospective pipeline emergency. Advancement to the far right column is not necessary in this application, but the importance of coordinating joint procedures and exercises to practice communication can be useful concepts.



Source: US Department of Homeland Security

Figure 1-4. The Interoperability Continuum

Elements of a Good Communication System

FEMA defines the elements of a desirable communications system:

- Interoperable—able to communicate within and across agencies and jurisdictions
- Reliable—able to function in the context of any kind of emergency
- Portable—built on standardized radio technologies, protocols, and frequencies
- Scalable—suitable for use on a small or large scale as the needs of the incident dictate
- Resilient—able to perform despite damaged or lost infrastructure
- Redundant—able to use alternate communications methods when primary systems go out (FEMA, "Student Manual" 2008, 4.3-4.4).

These elements should be kept in mind when designing plans and exercising communications procedures for pipeline emergency communications. Again, while these requirements are designed for public safety communications systems, procedures and technology should be in place to develop some level of redundancy so that if a primary means of communication between the pipeline operator and the public safety first responders is disrupted, an alternate means of communication can be used.

In operational terms this burden would fall primarily on the pipeline operator because public safety communications systems are designed with redundancy and resilience in mind (Figure 4-3).

Chapter Summary

Pipelines are a key element of our nation's energy infrastructure. Although they operate with a high degree of reliability, they are subject to incidents caused by unintended release of contents. Even though most incidents are small in nature and detected promptly, the potential exists for significant environmental damage and injury to the public and responders.

Analysis of past major incidents has revealed that communication problems, particularly exchange of information between emergency responders and pipeline operators, have been a continuing challenge. Local emergency responders should identify pipelines within their response areas, and establish methods for contacting pipeline operators to be used in emergencies.

This communications planning should take place within the context of a community's overall emergency management planning, and be consistent with national guidance such as the National Incident Management System and Incident Command Systems. Such planning must consider the type of pipeline and products carried, as well as sensitive locations traversed by pipelines.

CHAPTER 2

Research Approach

Our team's research approach was three-fold. First, we analyzed and complied information on federal and state pipeline regulation, paying particular attention to requirements relevant to emergency incident communications. Next, we conducted a literature review and content analysis of critical pipeline incidents to date, using NTSB major incident reports, to understand the extent and effect of past communication failure during emergency pipeline incidents. Finally, we conducted three interrelated studies that examined the transfer of information during pipeline emergencies.

- A situation awareness information requirement analysis (SAIRA)
- An information flow analysis
- A failure modes and effects analysis (FMEA)

Case Study Review of Major Incidents

Examples of communication challenges in pipeline emergencies are presented in National Transportation Safety Board (NTSB) reports. For most pipeline incidents, initial reports typically occur immediately following a pipeline release and originate from detection by pipeline personnel, direct observation by the general public, and/or emergency responders. These entities are an important part of the communication system and need to be connected to formal public safety, pipeline operator communication and response systems for verification and action. Community 9-1-1 systems are a critical contact and coordination point; acting as clearing houses for exchange of information, not only between emergency responders and the public, but also among the involved pipeline company.

While the responses of public safety personnel are carefully scrutinized following large release and/or fatalities, not much information is available about the decision-making and internal information requirements inside of the pipeline operator companies. During efforts to contain a pipeline release, the coordination of communication among detection personnel and emergency dispatch units is a critical operation within pipeline companies. Research examines the value of establishing a clear line of control, both for interpreting information and communicating directions for subsequent action.

In order to provide the foundation for the evaluation of communication characteristics in pipeline incidents and suggestions for improvement, we reviewed thirty-two incident reports spanning from 1994 through 2012. These reports focus on critical accidents or unintentional incidents. These incidents were analyzed for common deficiencies and traits, degree of damage/loss, as well as communication types and failures. Cases occurred in 25 States.

Three Interrelated Studies

The decision to utilize the novel method of the situation awareness requirements analysis (SAIRA) as the centerpiece of our gathering information from field operators was designed to overcome weaknesses observed by the study authors in practical emergency management planning simulations such as tabletop exercises. When these exercises bring together representatives from agencies that do not routinely work together, they require considerable time to resolve issues of information needs for these diverse interest groups, terminology differences and jargon, and it takes time to clarify assumptions about incident management objectives. The SAIRA was designed by using a negotiated text method, to both elicit actionable and accurate information from participants, and also to inform participants of the perspectives and information needs of other key players managing the prospective event being simulated (Groner, Jennings, and Robinson 2012).

The situation awareness information requirement analysis (SAIRA) study therefore sought to identify the types of information that persons occupying key roles need to make actionable decisions during pipeline emergencies. The information flow analysis study was intended to reveal how required types of information (identified in the SAIRA) are transferred to the persons who need it, including both the sources of the information and the means for transmitting the information. The failure modes and effects analysis (FMEA) was designed to reveal the ways in which information may fail to reach the persons who make the actionable decisions, including the types of failure modes and the likelihood that they will occur.

Figure 2-1 shows the association among the three interrelated studies. The SAIRA yields types of information that are needed to make important actionable decisions. These types of information become input to the two subsequent studies. The information flow analysis is used to discover the source of information and the means by which the information can be transferred to the intended target of the information, that is, the persons who need the information to make actionable decisions. The failure modes and effects analysis uses the types of information as components of a communications system. The FMEA uses expert judgments to model the likelihood that various failure modes will prevent the timely transfer of needed information and the severity of the consequences if the information transfer fails.

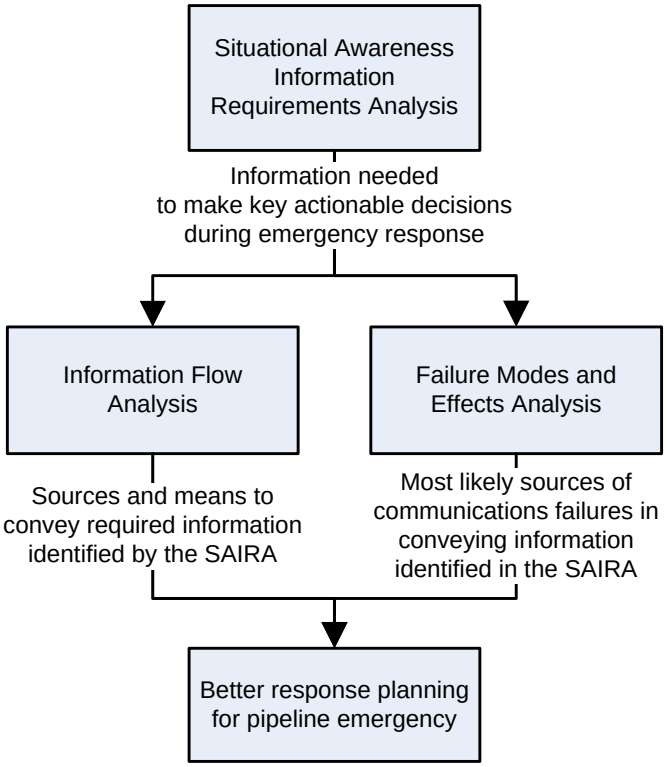


Figure 2-1. Relationships among the three parts of the research

Situation Awareness Information Requirements Analysis

A SAIRA was used to describe a generic emergency communications system. The method is designed to reveal the specific types of information needed by persons in specified roles to make timely and accurate decisions. The approach involves building a systems model using a goal hierarchy ranked in increasing degrees of specificity: (1) role, (2) goal or strategy, (2) objective or tactics, (3) actionable decision, and (4) required information. The SAIRA method had been developed and used in smaller-scale research studies before being used here to examine emergency communications during pipeline emergencies.

The SAIRA was formulated precisely to build communication systems models using a hierarchical goal approach as shown in Figure 2-2.

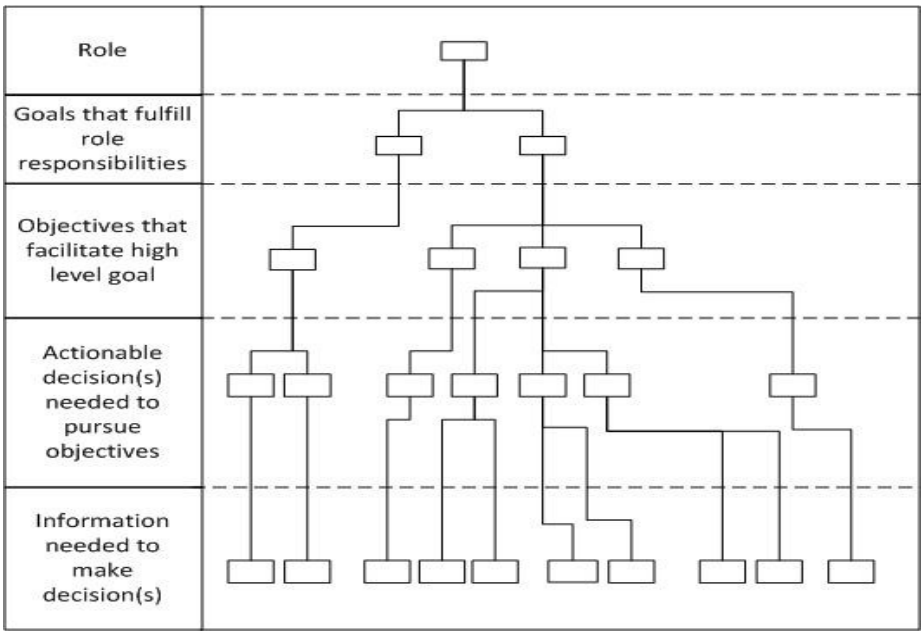


Figure 2-2. Goal hierarchy logic in a SAIRA.

The approach is similar to the analytic method described by Endsley and her colleagues who recommend a goal-directed cognitive task analysis (Endsley, Bolte, and Jones 2003). High level, abstract goals are broken down into increasingly specific objectives, and finally, into specific decisions. The approach was adapted so that it incorporated the role-specific objectives assumed by emergency responders from a variety of organizations.

Sample

Two (2) one-day workshops were conducted for the purpose of collecting data that would be used by the project team to build SAIRA models. The first workshop, held in Mahwah, New Jersey, focused on distribution pipelines and included representatives of emergency response organizations (municipal fire departments, county and municipal law enforcement, U.S. Coast Guard, a state environmental protection agency) and regional natural gas distribution utilities. A second workshop was held in Houston, Texas, and focused on transmission pipelines and included emergency response representatives (Houston Port Authority, municipal fire departments, a municipal emergency management office, municipal law enforcement, and the U.S. Coast Guard, the Department of Homeland Security Office of Infrastructure Protection, and the Environmental Protection Agency) and large corporate owners of transmission pipelines that, in addition to natural gas, transport liquid petroleum and other gaseous and liquid products.

Workshop participants were a nonrandom sample recruited directly by project team members and indirectly, through contacted organizations, assisted with selection. Persons were sought who had experience responding to pipeline incidents. The Mahwah, New Jersey workshop had 15 participants and the Houston, Texas workshop had 22 participants.

The participants were given a presentation that explained the purpose of the project and the intended method to collect data. Data collection involved working collectively with workshop participants to fill entries in a table. While a facilitator led the workshop, another project team member wrote entries into the table, which was displayed to the participants using a laptop computer, projector and screen. In this way, participants were able to read the data as it was recorded, and were continually invited to make changes that better expressed their points of view. The table, along with some representative data collected through the process, is shown in Table 2-1.

Table 2-1. Table used to collect SAIRA data during workshops, including a sample of data

Goals	Objectives	Decisions	Information Required to Make Decision	Comments
Prevent ignition	Identify ignition sources.	What sources of ignition can be controlled?	Presence of electric services, telephone, battery backups, generators, flares	
	Control ignition sources	What sources of ignition can be controlled?	Product involved, location of hazard (pipeline break, subsurface leak, inside building), local geography, elevation, and access	
	Ensure ventilation (natural or mechanical)	Is it safe to vent?	LEL - lower explosive levels, are electric sources still active?	Necessary to confirm modes of measuring gas concentration
		Where and how to vent?	Accessibility of windows, doors, additional openings (i.e. manholes)	
	Plume control (water-based dispersion)	Can the hazard be dispersed?	Product involved, location of hazard (pipeline break, subsurface leak, inside building), local geography, elevation, and access	

The project team met several times to review and reconcile the data from the two workshops. The set of roles, decisions and information requirements differed for the two workshops, and the project team had to combine and redefine entries in the two sets of tables to yield a single set of findings. The FMEA task leader created goal hierarchy diagrams and the team members met repeatedly using web-enabled conferencing to review the diagrams and suggest improvements.

Emergency Response Roles

Along with generating actionable decisions and information requirements, the project team worked closely with workshop participants to list and describe the key roles involved in responding to a pipeline

emergency and the associated information needs that drive necessary communications. The project team then analyzed the key decisions made at any pipeline emergency, based on this information. The project team then categorized the information needs required to make a well-informed decision in a timely fashion. Each role was associated with one or more decisions.

Roles refer to specific operational responsibilities or functions. The use of roles is contrasted with organizational identities (positions). A role is a functional category; persons from different organizations may be required to fulfill the same role. For example, individuals arriving early at a pipeline incident may need to assume the role (and make decisions) related to public protective actions, regardless of whether they are public safety responders, pipeline utility or company representatives. There are two primary reasons for using a role-based approach. First, the functional roles assigned to organizations differ across the United States. Second, despite their primary or perceived functions, organizations may be involved in multiple roles at an incident. Then again, multiple organizations may share responsibility or functional activity related to a single role.

Consider evacuation of the public as a role example. This is often considered primarily a fire or law enforcement role. However, depending on the nature of the incident and when assistance arrives, evacuation may be performed by building owners, security, pipeline operators, emergency medical services, or almost any other responsible party.

The role determines the information needed at each particular point in the progression of an incident. Organizations may have a set of information as their primary interest, but their information needs may vary depending on the particular role they fulfill. For example, if evacuation is a priority in the initial stages of an incident, law enforcement may be deeply involved in alerting and removing occupants of nearby structures from the hazardous area. Later, once sufficient fire service resources arrive, they may be more interested in issues of traffic control or expediting access to the scene for certain resources, such as pipeline crews. All personnel performing a particular functional role generally have the same needs for information, regardless of their organizational affiliations.

Key roles during pipeline emergencies

Roles are emphasized as an alternative way of understanding emergency response activities. Defined roles help overcome disparities due to variations in incidents and regional organizational differences; for example, emergency medical services may be performed by private providers or fire services. There are many commonalities, but roles in pipeline emergency incidents can vary widely depending on the location, nature, and product involved in the leak or spill.

Regulatory requirements related to organizational and functions roles

There may be regulatory requirements that govern activities or reporting, depending on the role. It is critical that all parties involved in pipeline emergency response be familiar with regulatory requirements in effect for their locale.

Federal laws and regulations require a state and local structure to enforce requirements, plan for emergencies, and disseminate information on hazardous substances located at fixed facilities. These structures, including Local Emergency Planning Committees (LEPC), can be a resource in preparing for

pipeline emergencies because they bring together local experts and response organizations. The LEPC contains representation from elected officials, emergency responders, environmental health and medical officials, representatives of fixed facilities that have quantities of oil or hazardous substances, and community and media representatives. The LEPC is just one example of a resource utilized prior to an event to identify information needs, roles, organizations and entities that have a role play in a local incident. Emergency Planning and Community Right-to-Know Act (EPCRA) Local Emergency Planning Requirements available at http://www.epa.gov/oem/content/epcra/epcra_plan.htm#SERC.

It is important to identify organizational notifications prior to an incident. For those regions with navigable waterways, response areas of federal responsibility between the EPA and the USCG should be clearly identified. Those areas are known to dispatchers and on-scene Incident Commanders.

Understanding the complex regulatory requirements and organizational structures used in response to a pipeline emergency is necessary for successful resolution of an incident. Identifying the key players, local organizations, state or federal supports, and the multiple roles played by these agencies is the first step in planning communication needs.

The information flow analysis

Given the urgency of communicating accurate and timely information during the early stages of a pipeline incident, analyzing the flow of information that needs to occur is invaluable. It is important to identify how information can best be relayed from the sources of the information to the persons who need to make key decisions using that information. An information flow analysis is a planning exercise that identifies: (1) who needs a particular type of information; (2) the source of that information; and (3) the best means to provide that information. Once an information flow analysis is completed, responders, regardless of their functional roles and organizational affiliations, will know what information to request and from whom. Similarly, persons will know to whom they need to provide information, and what means are best suited to providing that information. Information flow needs to be analyzed locally to take into the consideration the various entities that may need to respond and the relevant contact information.

The results of an information flow analysis can be compiled in a simple table, illustrated in table 2-2.

Table 2-2. Table used to compile information flow data

Who needs the information	What is the needed information	Source of the information	Means to convey the information
Metropolitan gas company	Location of the suspected leak	First arriving responders	Relay information to dispatcher. Dispatcher calls gas utility at 555-555-1234
Big pipeline transmission company	What is the product being released?	First arriving responders	Relay information to dispatcher. Dispatcher calls pipeline operator at 555-555-4321
First arriving responder	What are the hazards associated with hazards?	Pipeline operator	Relay information to dispatcher. Dispatcher calls pipeline operator at 555-555-4321

Output from the SAIRA provided input for the information flow analysis.

SAIRA provides information about the specific types of information likely needed by decision makers during the early phases of a pipeline incident. Knowing the types of information required is necessary but insufficient to ensure good communications. It is equally important to identify how to relay information from its sources to the persons who will make key decisions using that information. We offer a method for mapping the flow of information from sources to recipients.

The project team collected data using a questionnaire much like the SAIRA approach. However, this version asked questions about the sources of information and how to transmit that to recipients. Our goal was to identify a generic model of how information flows from sources to recipients. The project team was ambitious in attempting the largest sample ever used with this kind of study. In this case, it was determined that there were too many variables to produce a single coherent analysis. Information flows need to be modeled locally. Depending on the location, various entities may be responsible for collecting information and the technological and interpersonal means for sending the information can vary greatly.

At present, a valid general model of information flow for pipeline incidents does not exist. Instead, we provide an example where information flow data was collected and modeled for a single area, a county in New Jersey. Following these examples, this report offers suggestions about how to locally conduct similar analyses.

Example of an information flow analysis in a local jurisdiction

A project team member met with three experienced (currently active and retired) emergency responders from fire departments in New Jersey municipalities. With the team member acting as the facilitator, the group completed the same type of data collection table used in the questionnaire. The session was highly collaborative and involved extended conversations within the group. After collecting the data, the project team member represented the data as information flow diagrams and presented the diagram to the emergency responders for comments. All of the participants indicated that the diagrams were accurate.

Figure 2-3 is an illustrative example of how information flows can be represented using a simple diagram. The same findings can be written out in a narrative format or presented in a table, but a diagram is more easily understood and its creation requires only some proficiency using an appropriate software application (for example, Microsoft Word, Excel, or Visio®.)

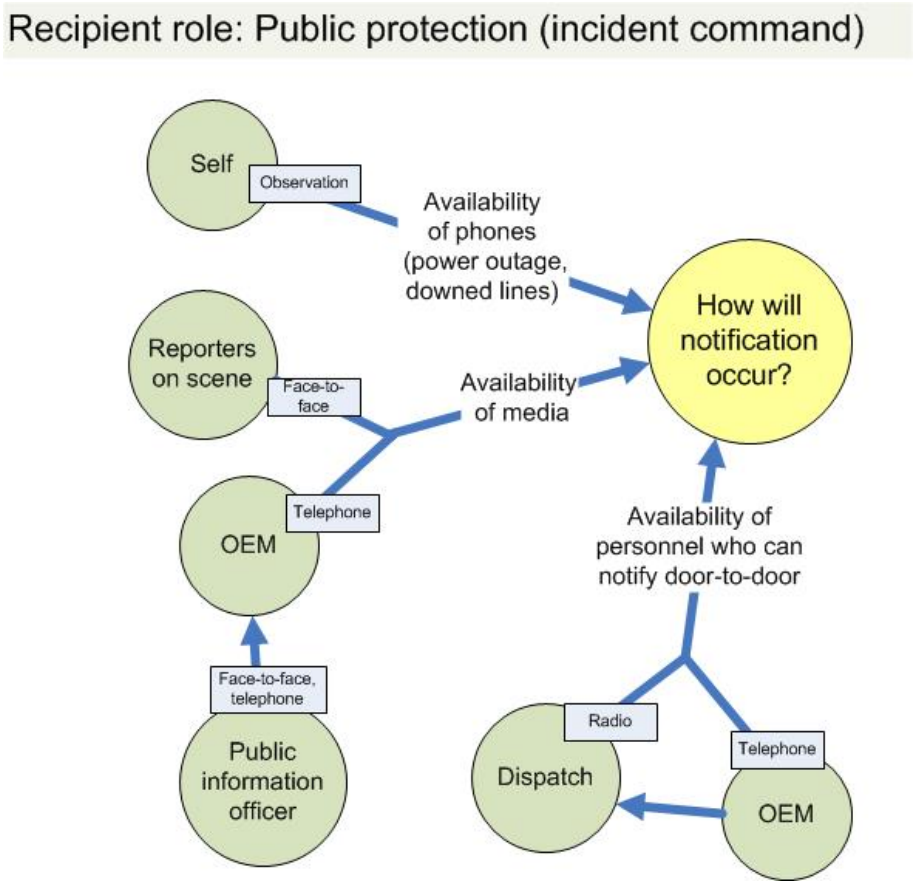


Figure 2-3. Sample Information Flow Diagram

Information flow diagrams can also be used to show what information a role-holder should be prepared to provide to people in other specific roles.

We used a questionnaire to acquire data for the information flow analysis. We used the table to collect data rather than creating diagrams because it is easier and more time efficient. Data in the table can later be converted to diagrams. Table 2-3 provides an example form to complete during a group interview. It is most effective to project the form as the interviewer fills in the answers, allowing group members to verify its accuracy and make corrections as needed.

Table 2-3. Sample data collection form for information flow analysis

Recipient role (target for information)	Decision(s)	Required information	Sources of information	Intermediaries	Means to convey information
Control of distribution line	Will the gas supply be shut off?	Impact of hazard	*Enter data here*	*Enter data here*	*Enter data here*
		Impact if gas is shutdown	*Enter data here*	*Enter data here*	*Enter data here*
		Availability of resources for shutdown (need more specificity, personnel, equipment)	*Enter data here*	*Enter data here*	*Enter data here*
	Where and how will the gas be shut off?	Amount of release	*Enter data here*	*Enter data here*	*Enter data here*
		GIS mapping	*Enter data here*	*Enter data here*	*Enter data here*
		Timeframe for repair	*Enter data here*	*Enter data here*	*Enter data here*
		Wind direction	*Enter data here*	*Enter data here*	*Enter data here*

Converting the data to an information flow diagram produces a more easily understood visual representation, and helps to avoid data omissions by revealing missing sources, links, and means for transferring information not easily detected in a table or narrative. Present the resulting diagram to the group for a final review so that they can fill in missing information and certify the accuracy of the analysis.

Failure Modes and Effects Analysis

We utilized a FMEA, a systems safety method that examines the various ways that a system's components can fail (i.e., the failure modes), along with the likelihood that such failure modes will occur, and the effects on the system's ability to fulfill its functions when components do fail.

For the purpose of this project we examined a generic pipeline emergency communications system in the FMEA, which is based on the findings of the SAIRA. In this context "generic" means that the system is general enough to apply to communications during all types of pipeline emergencies. An FMEA at the local level is likely to provide more accurate findings.

This FMEA focused on analyzing the categories of information needed to make actionable decisions that occur early during pipeline incidents. These decisions have two important characteristics; they are relatively unique to pipeline incidents and they are likely to be especially important in determining the favorability of the outcomes of the incidents. Decisions made later during an incident are common to many types of emergencies, especially those involving hazardous materials.

Data for the FMEA were collected using a panel of 15 experts. The Delphi method was used where the panel participants completed an anonymous online questionnaire where they rated (1) the likelihood that failure modes would prevent information from reaching the recipients who needed it, and (2) the consequences on the abilities of recipients to make decisions if the information was not received. All responses were organized and disseminated to the panel. The questionnaire was then administered again so that panelists could revise their ratings in light of the data provided by other panelists. The project team generated a list of failure modes that was considered to be reasonably comprehensive and exclusive. The list of the failure modes and definitions that were provided to the FMEA panelists is list shown in Table 2-4.

Table 2-4. Failure modes used in the FMEA

Failure mode	Definition
Information not collected	The information does not exist, or the potential source of the information does not collect, assemble or observe the needed information.
Recipient unknown	The original source of the information, or whoever is supposed to forward the information, does not know to whom the information should be sent.
Source unknown	Whoever needs the information does not know who to request it from.
Request poorly communicated	The request from the recipient is unclear; the exact information required is not clear to the source.
Information poorly expressed	The source of the information does not express the information clearly; only part of the information is transmitted; the information is inaccurate; equipment issues may garble the message.
Value of information unclear	The recipient does not understand the importance or value of the information; the source of the information is unclear; the source of the information is not trusted.
Information sent too late	The source does not collect and send the information soon enough to be useful in making the decision.
Technology unavailable or fails	Information cannot be sent because the source or the recipient does not have the available technology, the equipment lacks interoperability, or the means of transmitting the information is unreliable.

Chapter Summary

The challenge of understanding emergency communication among diverse agencies managing complex and rapidly evolving events is a considerable barrier to understanding information needs. A review of regulatory requirements and past incidents was used to inform the design of the SAIRA methodology. This methodology was used successfully to elicit candid, group-verified information, which was used to develop roles, decisions, and inform the development of the FMEA.

CHAPTER 3

Research Findings and Applications

In this chapter, we present the findings from the NTSB case study content analysis and the three related studies, the situation awareness information requirements analysis (SAIRA), the information flow analysis, and the failure modes and effects analysis (FMEA).

Analysis of Major Incidents

In the first phase of this project the critical incidents were analyzed for contributing factors related to this study. The following categories were used to classify incident-related deficiencies; multiple deficiencies were possible for a single incident. Table 3-1 summarizes the categories used and their frequency of occurrence in the 32 incidents.

Table 3-1. Common Deficiencies Identified in Pipeline Incidents 1994-2012

Deficiency	Percent of Incidents (Number)
No Emergency Response Issues	41 percent (12)
Delayed notification to pipeline operator	19 percent (6)
Delayed notification to emergency responders	25 percent (8)
On-scene coordination problem between pipeline operator and emergency services	6 percent (2)
Delayed action by pipeline operator	9 percent (3)
Emergency service on-scene problem	13 percent (4)
Pipeline operator on-scene problem	3 percent (1)
Other	13 percent (4)

Note: Percentages are greater than 100 due to multiple contributing factors for some incidents.
Source: Analysis of NTSB Reports

In summary, the most common problems are failure to promptly notify emergency services or the pipeline operator, followed by delayed action by a pipeline operator. The findings from the pipeline incident database showed that delays in the initial notification to both emergency responders and/or

pipeline operators are dominant, but that on-scene issues of coordination or proper action on the part of pipeline operators or emergency services also occurred at over 20 percent of incidents. Nearly all of the deficiencies noted above can be influenced by improved communications both during the planning and response phase of incidents as illustrated in Figure 3-1.

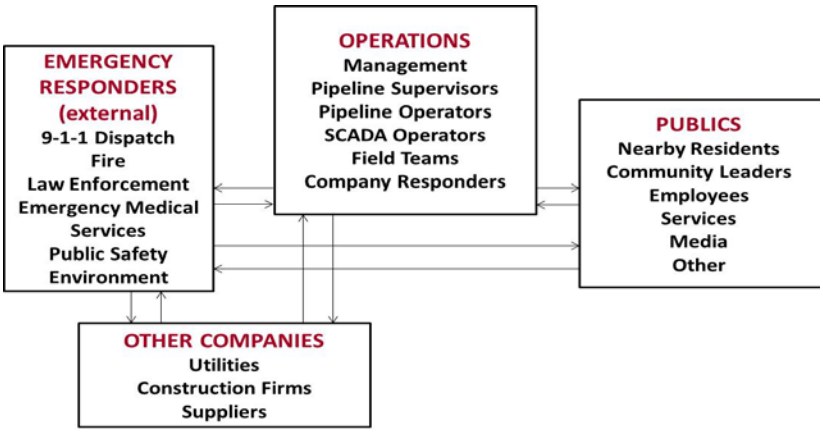


Figure 3-1. Roles, Organizations, and Communication Flows

Table 3-2. Summary of Losses from Major Pipeline Incidents 1994-2012

Incident Date and Location	Number of Fatalities	Number of Injuries	Total Cost of Damages	Total Cost Current Value (2012) $M
2011 Sissonville, WV	0	0	Not available	Na
2010 Marshall, MI	0	320*	>$760 Million	$760
2010 San Bruno, CA	8	15	$44,000,000	$46.0
2008 Rancho Cordova, CA	1	5	$267,000	$0.29
2008 Plum Borough, PA	1	1	$1,000,000	$1.1
2007 Carmichael, MS	2	7	$3,377,247	$3.8
2005 Bergenfield, NY	3	4	$863,300	$1.03
2004 Kingman, KS	0	0	$680,000	$0.8
2004 DuBois, PA	2	0	$800,000	$0.98
2003 Wilmington, DE	0	14	$300,000	$0.37
2003 Glenpool, OK	0	0	$2,357,483	$2.9
2002 Cohasset, MN	0	0	$5,600,000	$7.2
2000 Winchester, KY	0	0	$7,100,000	$9.5
2000 Greenville, TX	0	0	$18,000,000	$24.1
2000 Chalk Point, MD	0	0	$71,000,000	$95.2
2000 Carlsbad, NM	12	0	$998,296	$1.34
1999 Knoxville, TN	0	0	$7,000,000	$9.64

1999 Bridgeport, AL	3	6	$1,400,000	$1.93
1999 Bellingham, WA	3	8	$45,000,000	$62.0
1998 South Riding, VA	1	3	$250,000	$0.35
1998 Sandy Springs GA	0	0	$3,200,000	$4.48
1998 Saint Cloud MN	4	11	$399,000	$0.56
1997 Indianapolis IN	1	1	$2,000,000	$2.85
1996 Tiger Pass LA	0	0	Unknown	Unknown
1996 San Juan PR	33	69	$8,500,000	$12.5
1996 Murfreesboro TN	0	0	$5,700,000	$8.38
1996 Lively TX	2	0	$217,000	$0.32
1996 Gramercy LA	0	0	$7,000,000	$10.29
1996 Fork Shoals SC	0	0	$20,500,000	$30.14
1994 Waterloo IA	6	7	$250,000	$0.39
1994 Edison NJ	1	93	$25,000,000	$38.70
1994 Allentown PA	1	66	$5,000,000	$7.74

*Note: Includes people experiencing symptoms of exposure to oil.

Overall losses from major pipeline incidents between 1994 and 2012 are provided above (Table 3-2). Collectively they resulted in 84 fatalities, 630 injuries, and losses in excess of $1.1 Billion (2012 dollars).

Communication characteristics in pipeline emergencies

There are several dimensions for characterizing communications issues. The review of the NTSB reports and publications on pipeline accidents is presented here as a context for communications related to pipeline incidents. The literature findings are organized to address:

(1) Timeliness and types of communication identified within the reports and
(2) NTSB suggestions regarding communication to improve timely preparedness and response.

Timeliness

Timeliness is multi-dimensional and encompasses many functions. It pertains to the time it takes for a release to be recognized or identified, its specific location determined, the product flow isolated, and any release controlled. It also refers to how quickly emergency responders are able to be notified, arrive on the scene, and initiate response strategies and tactics to reduce the consequences and impacts of the incident. This could include isolation of the area, initiating public protective actions (evacuation or sheltering-in-place), leak and spill control, vapor suppression and fire extinguishment.

Although pipeline operators maintain sophisticated systems for monitoring pipeline flows and pressures and detecting leaks, incident experience has shown that small leaks may not be initially detected through these control systems. Even in cases of significant releases, direct observation by the public, pipeline personnel or contractors, and public emergency responders account for a well over half of all leaks first reported, according to a study commissioned by PHMSA (U.S. Department of Transportation, “Leak

Detection Study" 2012, 2-10). This means that information flow from the public and emergency responders, usually routed through public safety communications centers, often represents the initial notification. The timely ability to identify a pipeline emergency is the most important step in the incident management process.

Types of communication

As reflected in NTSB reports, types of communication that promote timely responses are extensive and encompass a complex set of roles and communication networks among those roles. Some reports specify communication among:

- Pipeline company personnel, for example, between
  - Pipeline operators (e.g., using information technologies such as Supervisory Control and Data Acquisition (SCADA) and other detection systems), company emergency dispatchers and response teams;
  - Operators or field personnel and company managers
- Pipeline company personnel (operators and managers) and external emergency responders, such as local fire services, law enforcement, public safety dispatch, local emergency management personnel, and public information designees
- Emergency responders external to the company such as public safety dispatch operators (e.g., 9-1-1), fire, law enforcement, emergency medical services, and emergency management agencies
- Emergency responders and the general public, health authorities, environmental and government agencies other than those directly involved in emergency services
- Pipeline company personnel and the general public

Identification of release source

Two characteristics of the source of a release include its location and extent.

Location of Source

Releases are reportedly detected in a number of different ways, for example:

Direct observations of the releases or their impacts constitute important forms of information gathering that occurs through the senses (sight, smell, sound). This source of information has often provided the basis for initial communications to emergency personnel.

Emergency responders and the general public in close proximity to a rupture are often the first alerted to the problem through direct observation. A key issue identified in some of the NTSB reports is the verification of these observations and the resolution of discrepancies between them (Bergenfield, NJ 2005; Marshall, MI 2010; San Bruno, CA 2010). In the Marshall, MI incident, there was a 17-hour time gap between the first report of a strange odor to the authorities and the detection of the leak, with multiple

conflicting reports. (NTSB, *"Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, xii).

Measurements such as pressure drops, shortages, and changes in flow rate are important sources of information that provide indicators of potential problems. (NTSB, *"Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 2). Appropriate detection equipment and the ability of operators to assess the information from this equipment are critical to providing the information necessary for locating and confirming unanticipated releases that can then be communicated to emergency responders. Commonly identified detection problems are:

- *Inability to detect anomalies preceding accidents.* On July 25, 2010, a segment of a 30-inch diameter pipeline owned by Enbridge Inc. ruptured in a wetland in Marshall, Michigan. The rupture occurred during the last stages of a planned shutdown. According to the NTSB, "Enbridge's leak detection and supervisory control and data acquisition systems generated alarms consistent with a ruptured pipeline that occurred July 25 and 26, 2010; however, the control center staff failed to recognize that the pipeline ruptured until notified by an outside caller 17 hours later. During the July 25 shutdown, the control center staff attributed the alarms to the shutdown and interpreted them as indications of an incompletely filled pipeline (known as column separation). On July 26, the control center staff pumped additional oil into the rupture for about 1.5 hours during two startups. The control center staff received many more detection alarms and noted large differences between the amount of oil being pumped into the pipeline and the amount being delivered, but the staff continued to attribute these conditions to column separation." NTSB, *"Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, xii-xiii).
- *Inadequate equipment or improper equipment usage.* In some cases availability of appropriate equipment needed to obtain the information for response is inadequate. In other cases, equipment is available but it is not used properly. NTSB noted several illustrative examples of this. In the 2008 Rancho Cordova, CA incident it took 2 hours and 47 minutes for a flame ionization detector to arrive once the incident was reported. A natural gas leak was located in a yard; and a nearby house was checked with a combustible gas meter and no significant gas levels were detected. An adjacent house was not checked. Several hours into the incident, this house exploded. One person died and five were injured. Fire services were not called until after the explosion. The delay in obtaining the flame ionization detector as well as the failure to check all houses led to the outcome. (NTSB, *"Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 3). In the 1998 St. Cloud, MN incident, a considerable delay ensued as contactors accidentally struck a natural gas line but failed to notify the emergency services. When they arrived, "firefighters attempted to take gas concentration readings with a gas monitor, but the monitor had not been calibrated in fresh air and gave invalid or unreliable readings. Firefighters continued to attempt readings with the improperly calibrated instrument, all the while working in an environment in which they described the gas smell as "pretty bad." During investigation by the gas company, an explosion ensued which killed 4 people and 11 were injured. (NTSB, *"Natural Gas Pipeline Rupture and Subsequent Explosion, St. Cloud, MN,"* 1998, 26).
- *Inaccurate interpretation of equipment results.* In the Chalk Point, MD case inspection data was not interpreted accurately. At the time this incident occurred, 2000, there were "inadequate operating procedures and practices for monitoring the flow of fuel oil through the pipeline to ensure timely leak detection." (NTSB, *"Rupture of Piney Point Oil Pipeline and Release of Fuel Oil Chalk Point, MD,"* 2000, vi). This also contributed to the magnitude of the fuel oil release. And, in the 1999 Knoxville, TN incident, the NTSB ultimately pointed to a contributing factor to the accident severity being the failure to determine that a release had even

occurred because they did not understand the information reported by the SCADA system. This mistake resulted in an increased volume of diesel fuel being released. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 11).

- *Inoperative warning systems.* In some cases, information is either not obtained because parts of the detection system are not operative or information is disregarded, resulting in actions that do not target the problem. The 1999 Knoxville, TN incident is a case in point: SCADA alarms reportedly did not sound for one part of the system to alert a pressure drop. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 2).
- This and other missed, or misunderstood, cues resulted in additional material being pumped into the pipeline exacerbating the release problem.

Alarms are essential components of communication equipment and in many instances are associated with physical measurements. Inoperative alarms, improper interpretation or inattention to alarm information, and improper action taken as the result of the alarm have been identified as contributing factors to the impact of substance release in pipeline incidents.

- *Inoperative alarms.* If an alarm is improperly maintained or installed, proper detection is not likely to occur. In the 1998 Sandy Springs, GA incident, the NTSB noted that there were no alarms operating in the control center to signal an alert of the failed line. (NTSB, "*Pipe Failure and Leak, Morgan Falls Landfill Sandy Springs, GA,"* 1998, 1).
- *Misinterpretation of alarms.* Similarly, misinterpretation of an alarm signal can lead to missed detection of a leak. In the 2003 Glenpool, OK incident, the pipeline operator thought the alarm was identifying a high product level in the tank, rather than a leak. (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 3).

Extent of the release and initial on-scene condition

Information on the extent of the release may not be readily apparent to emergency responders or even pipeline control room operators. On-scene emergency personnel need to be able to visually confirm that a release has occurred and provide an initial estimate of the magnitude of the spill or leak. This critical information is also necessary for initiating public protective actions, including decisions to evacuate civilians and summon additional resources to the scene.

Ideally, the public safety emergency communications center can ascertain that a pipeline is involved, and begin notification and coordination of multiple public emergency responder agencies early in the incident. In some cases, other utilities may have underground infrastructure that crosses, or even shares right of way with a pipeline. Communication between different companies has been identified as a problem on some incidents, in which a problem in one utility has affected the stability of an adjacent pipeline. Implementation of one-call systems such as "8-1-1" help avoid third-party incidents where contractors conducting excavations near pipelines unintentionally strike a pipeline and cause either an immediate or delayed release. When a release does occur, contractor personnel need to promptly report the emergency to 9-1-1. Several major incidents were identified where delays in notification led to increased incident damage and severity. First-hand observations of contractors who may have detailed information on the location of a leak or site hazards were often lost as workers reported the emergency to

their supervisors or third parties rather than alerting public safety emergency responders using 9-1-1 directly (NTSB, "*Natural Gas Pipeline Rupture and Fire Carlsbad, NM,"* 2000, 9).

Containment of release after the source is discovered

Excessive time between identification and containment of the leak has been linked to the exacerbation of the damage in several incidents. Specifically, in the 2010 San Bruno, CA incident, the NTSB reported that there was a 95 minute delay before responders were able to stop the flow of gas and isolate the rupture site. "A response time that was excessively long and contributed to the extent and severity of property damage and increased the life-threatening risks to the residents and emergency responders." (NTSB, "*Pipeline Accident Report. Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA,"* 2010, x). After the Marshall, MI incident in 2010, a survey of the public and emergency responders affected by the event revealed that 23 percent of the public and less than half of the emergency officials felt they were 'very well informed' about pipelines in the area. One of the NTSB conclusions was that with better information and communication "local emergency response agencies would have been better prepared to respond to early indications of the rupture and may have been able to locate the crude oil." (NTSB, "*Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, 104).

Attempts to reduce potential consequences to people

Evacuation/shelter-in-place. Evacuations occur in a number of different ways, as self-evacuation or one managed by emergency personnel. They can be voluntary or mandatory, accomplished via shelter-in-place or removal from the site. The nature of evacuation may change over time as conditions change, and can occur prior to, during, or after an incident occurs. Communications between emergency responders and residents or other exposed populations (e.g., workers, recreationists) are critical to carrying out evacuation decisions. Communication issues arose in connection with evacuation in a number of the incidents reported in NTSB reports regarding the time between noticing a problem (a release or signs of it) and evacuation decisions.

Evacuation-related communications were delayed in the Bergenfield, NJ incident of 2005 where members of a construction crew working near a pipeline noticed telltale smell and sounds of a natural gas leak. They identified a problem in a pipeline nearby, and attempted to fix it. The public, however, was neither notified nor evacuated by either the company or emergency responders. It was only after the explosion that rescue operations ensued. The NTSB noted "Contributing to the casualties in the accident was the failure of the Fire Department to evacuate the apartment building despite the strong evidence of a natural gas leak and the potential for gas to migrate into the building." (NTSB, *Natural Gas Service Line Break and Subsequent Explosion and Fire Bergenfield, NJ,"* 2005, 4-6, 11).

Communication and Response

Communication among company personnel

Communications within companies. Communications within pipeline companies occur in many different ways among different kinds of operators, operators and emergency dispatch, management and operators and emergency dispatch, and between operators and computerized communication and control systems.

Common communication problems that arose in past incidents among operators involved, (1) the process for verification or confirmation of information including a command structure to act on information, (2) documentation and transmission of information between shifts and among personnel in general, and (3) communication equipment and its support of information gathering for preparedness and response.

Command Structures. In the 2010 San Bruno, CA incident, the following communications issues were reported among company personnel, primarily the operators. The NTSB report identified the need for a command structure in light of their observations. (NTSB, "*Pipeline Accident Report. Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA,"* 2010, 14-16, 98-99, 101).

- Communications were lengthy and indecisive within the company and among SCADA personnel, reflecting uncertainty in the nature and location of the rupture (pp. 15-16). These communication problems were compounded by the need for better detection equipment (p. 101). While prompt action was taken at one terminal after the alarm sounded, the need for further action was acknowledged. "It was evident from the communications between the SCADA center staff, the dispatch center, and various other PG&E employees that the roles and responsibilities for dealing with such emergencies were poorly defined." (p. 98).
- Extensive communications among SCADA staff and upper management occurred which only contributed to the delayed response (p.16). Company protocol at the time required extensive notification among company personnel before action could be taken (p. 14); and
- Communications were neither clear nor timely between SCADA operators and emergency dispatchers (pp. 98-99). The NTSB concluded that communications between SCADA operators identifying the alleged source of the rupture and the emergency responder dispatchers within the company reflected a "lack of a centralized command structure" (p. 98).

Documentation. NTSB noted the need for better documentation and reporting of the flow of information overall within the company, and between the company and outside entities. Specifically the NTSB indicated in the 2008 Rancho Cordova case that the company "did not require any of the responders to periodically check in with their dispatch offices to communicate delays in responding." (NTSB, "*Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 14). The 2010 Marshall, MI incident was also indicated because the company "required specific information to be exchanged during shift changes, but no formal documentation or written record of the exchanged information". (NTSB, "*Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, 10). This leads to information loss and lack of accountability, as one worker claimed he had not been informed about what had happened in the previous shift.

The location of necessary documentation is also a factor. For example, in one incident, information that was collected about the facility was done in one location but analyzed in another. While control center technology has been advanced since this incident, with this site's "polling and transmission times, delays of up to 1.5 minutes could occur between the time an event occurred and the time it was recorded." (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 15).

Communication Equipment. Pipeline companies depend upon equipment to detect and communicate accident precursors, characteristics, and often the remote control of equipment for response. The information support provided by better detection equipment was cited in a few reports, for example, in the San Bruno, CA (p. 101) and Rancho, Cordova, CA (p. 3) incidents described above. In the context of communications within companies, a common type of equipment used is SCADA systems, as was used during the Carlsbad, NM incident in 2000. The NTSB noted that a break occurred in the SCADA communication system at an important point in the incident. While the break was "neither causal nor contributory to the accident or its aftermath", they did note that periodic gas monitoring, and monitoring of liquids and solids, from certain locations "would likely have determined that the potential existed for significant corrosion to occur in the pipeline." (NTSB, "*Natural Gas Pipeline Rupture and Fire Carlsbad, NM,"* 2000, 49).

However, in the 1999 Bellingham, WA incident, deficiencies in the SCADA system were described as a factor in communications problems related to operator ability to take actions to prevent the rupture. (NTSB, "*Pipeline Rupture and Release of Gasoline, Olympic Pipeline Company, Bellingham, WA,"* 1999, 71).

Communication among companies. During an emergency, communications among pipeline companies and equipment suppliers occur for the purpose of transferring or sharing supplies and services; among electric utility and pipeline companies where electrical charges can potentially ignite material transported by pipelines if they are ruptured; and among construction and pipeline companies to avoid accidental pipeline ruptures.

Pipeline Companies and Equipment Suppliers. In terms of supply transfers, communications before and during an incident can be significant for the provision of supplies that may not be readily available to responders under normal conditions. In the 2003 Glenpool, OK incident response, an area supervisor indicated that there was an inadequate supply of 'Class B firefighting foam" on site, activating a communication network among pipeline companies to obtain more. (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 7).

Electric Utilities and Pipeline Companies. Communications among pipeline companies and managers of electric power lines were also identified as an issue in the Glenpool, OK incident. Electrical line operators were called in to ensure the integrity of the electric power lines. Sometime after the check the lines fell, contributing to ignition. The need for effective communication among the electric power operators through the unified incident command system was cited as an issue, as well as between the electric power company and pipeline operators. Furthermore, the NTSB report noted the need for training of electrical utility operators about pipeline matters to help prevent future mishaps. (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 7-8, 34, 36).

This communication issue is also illustrated in the 1998 incident in Saint Cloud, MN, where an electrical line installer ruptured a gas line but delayed in notifying the emergency services. The NTSB concluded that "had the crew foreman or his supervisor called 9-1-1 or the utility owner immediately after the rupture, emergency responders and NSP [utility] personnel may have had time to fully assess the risk and to take actions that could have helped either prevent the explosion or avoid the resulting loss of life." (NTSB, "*Natural Gas Pipeline Rupture and Subsequent Explosion, St. Cloud, MN,"* 1998, 23).

Construction Contractors and Pipeline Companies. Excavation was cited as contributing to a number of pipeline ruptures, for example in the Bergenfield, NJ, Wilmington, DE, Bridgeport, AL, Bellingham,

WA, Sandy Springs, GA, St. Cloud, MN and Edison, NJ cases. Analyses of PHMSA data have identified construction accidents as a source of pipeline ruptures. The Restrepo, Simonoff and Zimmerman analysis of PHMSA data from January 2002 to December 2005 for hazardous liquid accidents found that third party excavation damage which encompasses construction-related accidents accounted for 4.2 percent of the pipeline accidents and ranked fourth among others as a cause. Third party excavation damage accounted for 12.5 percent of natural gas transmission incidents between 2002 and May 2009 ranking second among other causes and 30.9 percent of natural gas distribution incidents between 2004 and May 2009 ranking first among other causes. (Restrepo et al. 2009, 40)

The communication issues associated with construction accidents that affect pipelines vary. Sometimes, the location of a pipeline is inadvertently unmarked, marked improperly, misinterpreted, or a contractor does not fully understand the significance of a rupture when it occurs.

Communication of inspection information was an issue in some incidents, such as the 1999 Bellingham, WA case, where unannounced inspection visits were not documented. The pipeline company did not have its own set of construction drawings, changes in the pipeline preceding the accident by a number of years were not documented, and the handling of information in early inspection reports to support some actions the company could have taken were also identified by NTSB. (NTSB, "*Pipeline Rupture and Release of Gasoline, Olympic Pipeline Company, Bellingham, WA,"* 1999, 20-21, 24, 71).

The NTSB noted that the precursor to the 1998 St. Cloud, MN incident was that worker estimates of the distance to pipeline did not take into account the angle at which their installations were occurring, or the unusual underground conditions which led to construction work near the pipeline. Similar circumstances had occurred in the Indianapolis, IN incident of 1997. (NTSB, "*Pipeline Rupture and Fire Indianapolis, IN,"* 1997, 3, 35-37).

And according to the NTSB report of the Wilmington, DE incident in 2003, a backhoe ruptured an unmarked gas line and the backhoe operator could not recognize damage to the pipeline. The crew members notified their management; however, the crew and management had different assessments as to whether or not there was a gas odor. (NTSB, "*Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, DE,"* 2003).

The NTSB recommended better communication between pipeline companies and contractors working near pipelines and underscored a procedure from the Common Ground Alliance that pertains to the communication about the location of underground pipelines through marking verification at the location of excavation, and the use of a procedure similar to a "one-call" system to notify underground facility owners (who belong to the system) of excavation plans. (NTSB, "*Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, DE,"* 2003, 1, 5).

Communication between the company and response entities outside of the company

A common issue described in many NTSB incident reports involved the communications interface between companies and emergency responders. These communications usually occur through 9-1-1 systems or directly to emergency responders. Key issues the NTSB identify include (1) delays in companies notifying emergency response personnel, resulting in people outside the companies notifying 9-1-1, and (2) the need for the provision of information to emergency response personnel about pipelines prior to incidents.

In the San Bruno, CA incident, there were delays in notifying outside emergency response officials and members of the community. As a result of this, and similar response issues, NTSB recommended that specific kinds of information, about the characteristics of pipeline systems, be shared prior to an incident occurring. At the time, company procedures did not require the notification of emergency services using 9-1-1 or other ways. Similar problems were also noted above in the Rancho Cordova, CA and Marshall, MI incident reports. (NTSB, "*Pipeline Accident Report. Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA,"* 2010, 100). (NTSB, "*Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 4). (NTSB, "*Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, 104).

In some cases, such as with the 2000 Chalk Point, MD incident, the company's emergency response plan had adequate communication criteria in place prior to the emergency. The problem was that local response agencies were not notified, and there was more than one applicable emergency plan which caused confusion. "[E]ach plan had a somewhat different purpose and focus and the general supervisor did not know which plan applied to this accident. Consequently, he attempted to notify all response personnel identified in all three plans." (NTSB, "*Rupture of Piney Point Oil Pipeline and Release of Fuel Oil Chalk Point, MD,"* 2000, 10). The report noted that the EPA Federal On-Scene Coordinator used a project management structure rather than an incident command structure giving the company, who was the responsible party, "primary responsibility for directing and monitoring the activities of response contractors" that ultimately led to communication problems that affected management.

In the Glenpool, OK incident, the explosion and subsequent fire in the storage tank, was in part attributed to a lack of communication between a company servicer and incident command staff. The servicer "had inspected the power lines and reported to the transmission system operator. No sag in the lines was observed, and the servicer, who did not communicate with any incident command staff, returned home." (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 7).When the fire reignited, the servicer was called again, the NTSB report indicated that "Incident command was notified that the servicer was on site, but the servicer did not check in or otherwise communicate with incident command." (NTSB, "*Storage Tank Explosion and Fire Glenpool, OK,"* 2003, 8).

An outcome of the 1999 Knoxville, TN incident was that the company upgraded connections with emergency responders such as fire, police and others. Much of the communication in the early stages of the incident seemed to occur separately between two groups: company personnel, and between emergency responders (firefighters) and residents through 9-1-1 calls. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 2-3, 10).

Similarly, in the Carlsbad, NM incident, the NTSB reported that "[pipeline] employees who initially had information that vehicles may be parked in the vicinity of the fire did not notify emergency responders until the fire was extinguished and the presence of vehicles was confirmed." (NTSB, "*Natural Gas Pipeline Rupture and Fire Carlsbad, NM,"* 2000, 39).

The Wilmington, DE incident report explicitly recommends that construction contractors working near pipelines immediately notify emergency response units via 9-1-1 if there is an incident. (NTSB, "*Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, DE,"* 2003, 5).

Communication among emergency personnel

Promptness. Most NTSB reports indicate that prompt action is taken by emergency responders to address an incident, though little information is given about communication among those responders. Often, responders first become aware after an explosion has occurred.

In the San Bruno, CA incident, there were prompt communications between residents and emergency responders (through 9-1-1), between emergency responders (police) and 9-1-1, (a result of seeing and hearing the explosion), and between firefighters and water tenders: "The rupture occurred at 6:11 p.m.; almost immediately, the escaping gas from the ruptured pipe ignited and created an inferno. The first 9-1-1 call was received within seconds. Officers from the San Bruno Police Department arrived on scene about 6:12 p.m. Firefighters at the San Bruno Fire Department heard and saw the explosion from their station, which was about 300 yards from the rupture site. Firefighters were on scene about 6:13 p.m. More than 900 emergency responders from the city of San Bruno and surrounding jurisdictions executed a coordinated emergency response, which included defensive operations, search and evacuation, and medical operations. Once the flow of natural gas was interrupted, firefighting operations continued for 2 days. Hence, the emergency response by the City of San Bruno was prompt and appropriate." (NTSB, "*Pipeline Accident Report. Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire, San Bruno, CA,"* 2010, x).

In the Kingman, KS incident according to the NTSB report, emergency responders worked closely with one another coordinated by the 9-1-1 dispatch center. An off-duty volunteer firefighter noticed a vapor cloud, called the 9-1-1 center which in turn notified the fire department to contain the fire and the sheriff's office in turn managed an evacuation. (NTSB. "*Anhydrous Ammonia Pipeline Rupture near Kingman, KS,"* 2004, 2, 4). Similarly, within minutes of the Rancho Cordova, CA (NTSB, "*Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 1, 7) and Wilmington, DE (NTSB, "*Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, DE,"* 2003, 4) explosions, emergency responders were reported to have arrived on the scene.

Delays. Causes of delays in emergency responders communicating incidents, or their characteristics, among themselves have been linked to failure of detection equipment, lack of training, and insufficient information. Two prime examples include the 2007 Carmichael, MS and the 2000 Chalk Point, MD incidents.

In the Carmichael, MS incident, information from the local dispatch unit was never received by the fire department because the repeater had been unintentionally disabled during a routine cleaning shortly before the event. The situation was being monitored by dispatch, who was awaiting confirmation of their communications. It wasn't until a Chief of the fire department heard the explosions that the fire response was initiated. This underscores the need for multiple communication routes and a way to check the status and condition of communication equipment. Another oversight highlighted by the NTSB report was that local emergency dispatchers were not included in the pipeline company's training program. (NTSB, *Rupture of Hazardous Liquid Pipeline with Release and Ignition of Propane Carmichael, MS,"* 2007, 5, 45).

In the Chalk Point, MD case, the National Response Center watch officer incorrectly classified the type of release: "lacking information on the exact source of the leak, [he] inaccurately classified it as a fixed (power plant) facility rather than a pipeline-type incident" (NTSB, "*Rupture of Piney Point Oil Pipeline and Release of Fuel Oil Chalk Point, MD,"* 2000, 12) and the Office of Pipeline Safety did not receive notification because he "was on the pipeline accident distribution list but not on the fixed facility

distribution list." (NTSB, "*Rupture of Piney Point Oil Pipeline and Release of Fuel Oil Chalk Point, MD,"* 2000, 12).

Communication between the general public and emergency managers or response entities

In a disaster situation, the public relies on emergency responders for many things. 1) Prompt and reliable instruction regarding necessary action and precaution, 2) prompt and reliable communication to responders on the ground for verification and action, and 3) dissemination of up to date information regarding location of pipelines and hazards.

Instruction regarding necessary action and precaution. Providing the public with prompt and reliable instructions is imperative. Should the person remain on premises or evacuate immediately? In the Carmichael, MS incident, the 9-1-1 "operator did not tell the caller to get out of the house and run away from the smoke." (NTSB, *Rupture of Hazardous Liquid Pipeline with Release and Ignition of Propane Carmichael, MS,"* 2007, 4). Each case is different, and circumstances may in fact change throughout an incident. In order to provide prompt and reliable instruction, responders need prompt and reliable information (considerations for evacuation and shelter-in-place procedures are discussed later in this chapter).

Communication to responders on the ground. In the Marshall MI incident, the NTSB report describes the sequence of communications about noticing and reporting odors. About 3.5 hours from the time of rupture the county 9-1-1 center received calls about a natural gas odor. They dispatched firefighters who could not pinpoint the source of the odor. Meanwhile, about a half hour earlier, a technician was dispatched in response to a report of a strong odor by a resident, and about 5 and a half hours after the rupture "an employee at a business called 9-1-1 to report a natural gas odor. The 9-1-1 dispatcher explained that the fire department had already responded to calls in the area, and no more personnel were dispatched". Over 17 hours later a gas utility worker responded to numerous calls regarding a natural gas odor, reported them to the company control center, and within five minutes the company began shutting down the pipeline. (NTSB, "*Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, Marshall, MI,"* 2010, 2-3, 10).

In the Knoxville TN event, fire department responders could not identify the source of the odor reported by local residents, and did not have local pipeline maps to refer to. They assumed the source was from a local manufacturing plant rather than a pipeline rupture, so the firefighters returned to quarters without further action. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 2).

Information dissemination regarding pipeline and hazards. The public also relies on information from pipeline companies about the existence of pipelines in their area. How wide an area is subject to notification of pipeline information came up in the Knoxville, TN incident, where the distance for mailings as part of a public education program was expanded from the original one eighth mile distance of residents from the pipeline prior to the release to one quarter mile after the release. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 4, 10).

In 2000, 12 people died in a pipeline explosion in Carlsbad, NM. They were camping in an undesignated recreational area near the pipeline that ignited. This calls attention to communicating information about pipeline location to recreationists and visitors as well as residents potentially in the

vicinity of a pipeline. The NTSB noted that although emergency responders reacted relatively quickly to the fire, firefighters were unaware of the campers: "The emergency responders anticipated a routine standby assignment that would terminate when the flow of natural gas was stopped and the fire was extinguished. Because the accident was in a rural area, emergency responders did not expect to find any persons injured." 40 minutes after the rupture, "an employee thought he saw vehicles in the area of the fire . . .." (NTSB, "*Natural Gas Pipeline Rupture and Fire Carlsbad, NM,"* 2000, 39). The NTSB underscored the need for responders to have information about victims potentially being in an area.

Communication between the general public and pipeline companies

The public can communicate directly with pipeline companies about odors potentially coming from a release. Companies in turn can communicate with the public in the form of information about pipelines nearby and warnings in the event of an incident. PHMSA has several public awareness programs to provide pipeline safety information, for example, American Petroleum Institute's Public Awareness Program, API RP 1162.

Public communications to companies. In many cases, people in the vicinity of a release are the first to notice the problem and immediately call emergency personnel. In the Rancho Cordova, CA incident, a resident called a company customer contact unit about an odor hours prior to the explosion. In spite of company investigations and numerous calls among field inspectors, a foreman did not arrive on the scene until shortly before the explosion. The fire department did not evacuate residents in time because they weren't notified prior to the explosion. (NTSB, "*Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 1, 5).

In the Greenville, TX incident, residents near the source of the pipeline failure began calling the company, as well as 9-1-1, soon after the rupture when the gasoline odor was detected. (NTSB, "*Hazardous Liquid Pipe Failure and Leak, Explorer Pipeline Company Greenville, TX,"* 2000, 2).

There are incidents where it is clear that the general public in the vicinity would have benefitted from more training and education regarding the contact of emergency personnel at the pipeline company or public agencies. Prior to the Plum Borough, PA incident, there were no reports of calls concerning gas odors or other suspicious smells (though, there may not have been an identifiable odor). Residents did not report a problem until after the explosion occurred. Although firefighters arrived within ten minutes of the explosion and reportedly extinguished the fire within a half hour, fires fed by the gas pipeline were still being managed up to 5 hours later. (NTSB, "*Natural Gas Distribution Line Break and Subsequent Explosion and Fire Plum Borough, PA,"* 2008, 2).

Residents also failed to notify the pipeline company or emergency responders in both the Wilmington, DE and Knoxville, TN incidents. In the former case, a resident noticed the gas odor but did not call anyone. In the latter case, a resident did not report a kerosene odor. (NTSB, "*Hazardous Liquid Petroleum Products Pipeline Rupture, Colonial Pipeline Company, Knoxville, TN,"* 1999, 2). (NTSB, "*Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, DE,"* 2003, 4).

Company communications to the public. Pipeline companies have notification procedures regarding the public in case of an emergency. Notification error or delay can lead to increased casualties. In the Carmichael, MS incident, company procedures enabled information about pipeline problems to reach the public; however, the list of addresses had not been kept up to date. Many of the residents within

proximity of the explosion, therefore, were never contacted. (NTSB, *Rupture of Hazardous Liquid Pipeline with Release and Ignition of Propane Carmichael, MS,"* 2007, 44).

Sometimes company emergency personnel did not warn the public at all, such as in the Rancho Cordova, CA incident. The gas company failed to identify the source of the leak and residents were not warned by the field inspector of the potential hazard while they were inspecting; no yellow warning tape was installed to notify the public of a problem. (NTSB, *"Explosion, Release, and Ignition of Natural Gas, Rancho Cordova, CA,"* 2008, 4, 14).

Situation Awareness Information Requirements Analysis

In the second phase of this project we analyzed the informational content of communications using SAIRA, a method that uses a goal hierarchy approach to show the relationship among functional roles, operational goals, actionable decisions and information requirements. For every role, there are actionable decisions made to fulfill that role. And for every decision, there are types of information required by the decision maker. The project team only addressed the roles, decisions, and information types considered to be relatively specific to the early phases a pipeline incident, as identified below. The findings are generic and may vary in its applicability by locale.

There are two benefits of using the SAIRA approach: (1) the ability to identify the exact information needed so individuals in each role can make good, actionable decisions and, (2) the ability to identify the types of information that need to be collected and sent to someone else in a different role, along with the reasons why the recipient needs the information.

Functional roles

The SAIRA approach requires the identification of functional roles. The project team developed an initial set of roles that were refined as a result of suggestions from the workshop participants. These participants included pipeline operators, emergency responders (including fire, EMS, and law enforcement), emergency managers, and environmental protection and hazardous materials specialists (As discussed in Chapter 2, it is important to note that "roles" are not the same as positions within an organization.)

Initial receipt of notification by pipeline operator

Although pipeline operators maintain sophisticated control centers and monitoring systems (particularly for transmission pipelines), research into previous incidents has shown first reports of an incident often come from the public, emergency responders, contractors, or field-based employees of the pipeline operator.

Control of pipeline release

Control of the pipeline release involves personnel charged with closing valves to isolate a leak or spill, or mitigating the effects of the release. These personnel may be field-based pipeline employees, pipeline control center personnel, or emergency responders on the scene of an incident.

First arriving responders

Emergency responders (operator personnel on-site or public agency) are generally the first trained personnel to arrive on scene during the initial stages of a reported incident. The role of first responder is usually filled by personnel assigned to public safety response organizations such as fire departments, police departments or, in the case of coastal water-based incidents, the Coast Guard.

Public safety answering point (PSAP) call-taking and dispatch

Public safety answering point (PSAP) call-taking and dispatch refers to the organization receiving 9-1-1 calls for a particular geographic area. These geographic areas usually coincide with political subdivisions such as counties, cities, towns, or other governing areas.

The call-taking role may be shared among one or more organizations; the PSAP receiving the initial call may transfer the caller and information to a specialized call-taking facility where additional details are obtained.

Dispatch is the last stage of this role. Information collected in the first phase of this process is used to determine the number and type of resources (personnel and equipment) required to respond to a reported incident. The dispatch process is ordinarily governed by locally determined protocol and procedures.

Notification of supporting agencies and organizations is another key function of this role and is usually undertaken at the point of dispatch. Supporting agencies can include the pipeline operator, specialized response resources, and state or federal agencies.

Incident Commander/dispatch resource response request

The Incident Commander/dispatch resource response request role refers to the interaction between the on-scene Incident Commander and the supporting 9-1-1 or dispatch center. Both entities are charged with discerning the need for additional support for the management of the reported incident. Communication between the Incident Commander and dispatcher is critical to developing a common understanding of the incident (common operating picture), and is dependent on flow of information between the dispatch center and Incident Commander.

Examples of communication from the field to the dispatcher: (1) identification of a pipeline marker adjacent to a reported release; (2) dispatchers gathering and summarizing key information from the public, such as additional reports of odors from nearby locations, possibly indicating the extent of a release, and (3) relaying information, such as estimated time of arrival for specialized resources called to the scene.

Public protective actions

Public protective actions are the efforts undertaken by emergency responders to safeguard life, property, and the environment. Depending on the nature of a spill or release, the role may include: (1) evacuation; (2) environmental assessment; (3) containment of runoff; or (4) firefighting.

Federal and state support for environmental protection

Environmental agencies at the state and federal levels play an important role in terms of: (1) reporting of releases; (2) provision of expertise and support for mitigation of incidents; and (3) environmental restoration. On scene support may be provided for large releases, or release of materials harmful to human health or the environment. Such support ranges from provision of expert guidance, to performance of monitoring, or delivery of specialized equipment.

Decisions By Pipeline Operators

The workshop participants reviewed various roles associated with emergency responses to pipeline incidents and provided their views on actionable decisions. The project team used this data to consolidate findings from the two workshops, yielding a set of decisions applicable to pipeline operators and public safety agencies. Figures 3-2 through 3-9 presents the findings using the goal hierarchy as shown in Figure 2-2.

When pipeline operators are first notified that there may be an emergency, they have three important objectives: they need to determine if they are the responsible party, who they need to notify, and what resources and personnel need to be deployed.

Response

The moment a pipeline operator is notified that there is a problem they need to determine whether the problem involves their company's pipeline or whether responsibility is on another organization or operator. As shown in Figure 3-2, information needed to make this determination includes: (1) the location of the incident; (2) the findings of any investigation by local responders via their Communications Center; (3) information about the product being released; and (4) local contact information to request additional information.

Notification

If the pipeline operator is accountable for the release, they then need to determine which public safety, state and federal agencies, will need to respond to the incident. Information associated with these decisions will include: (1) location of the incident; (2) product being transported through the pipeline; (3) amount of product in the pipeline that has been and is likely to be released; (4) responsible jurisdiction for where the release has occurred, including whether it is outside one of their facilities, or whether the release can potentially contaminate an inland zone (Environmental Protection Agency jurisdiction) or a

coastal zone (U.S. Coast Guard jurisdiction); and (6) regulatory requirements that specify required responders and the response time-frame. NTSB reports recommend that this type of information be communicated to emergency responders and the communities in which pipelines are located. See Figure 3-2.

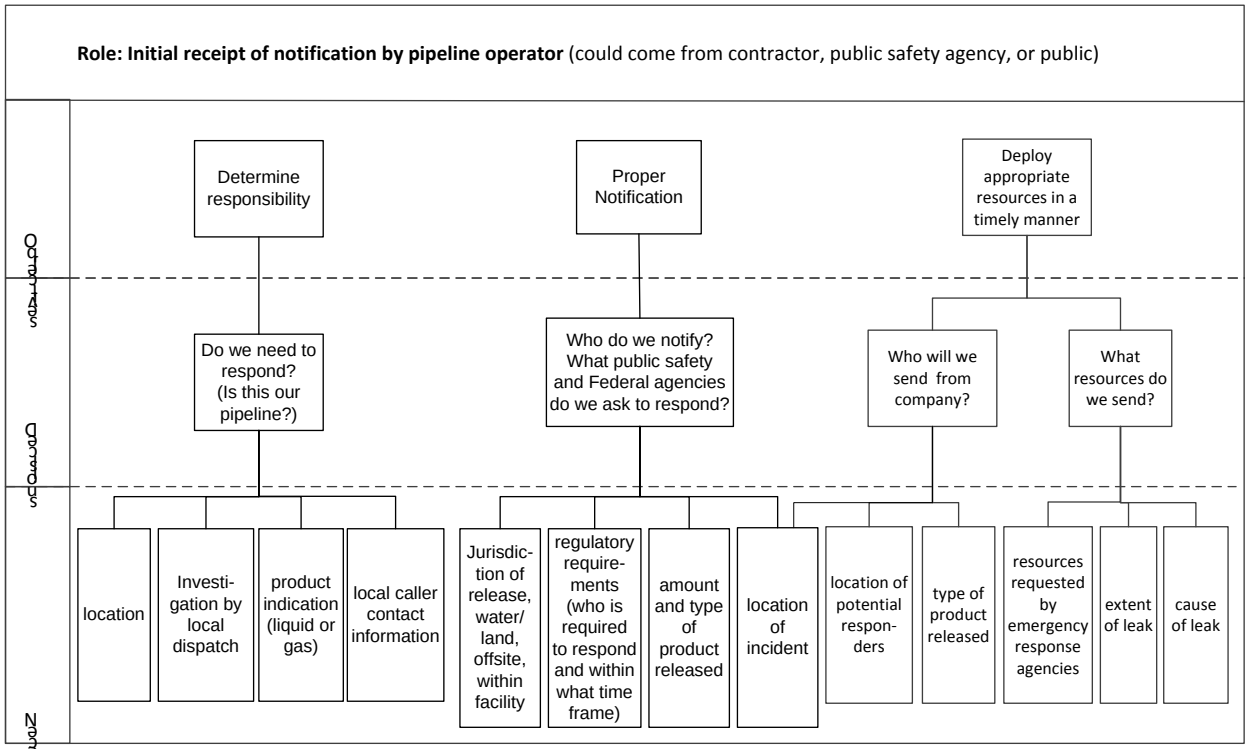


Figure 3-2: SAIRA tree for initial receipt of notification by pipeline operators

Resource allocation

When pipeline operators receive notification to respond, they need to deploy appropriate resources in a timely manner. The response is dependent upon two decisions: who will be sent from the company and what resources do they need?

In order to dispatch appropriately trained personnel, the pipeline operator needs the following types of information: (1) the location of the incident; (2) the location of potential responders able to respond quickly; and (3) the type of product released.

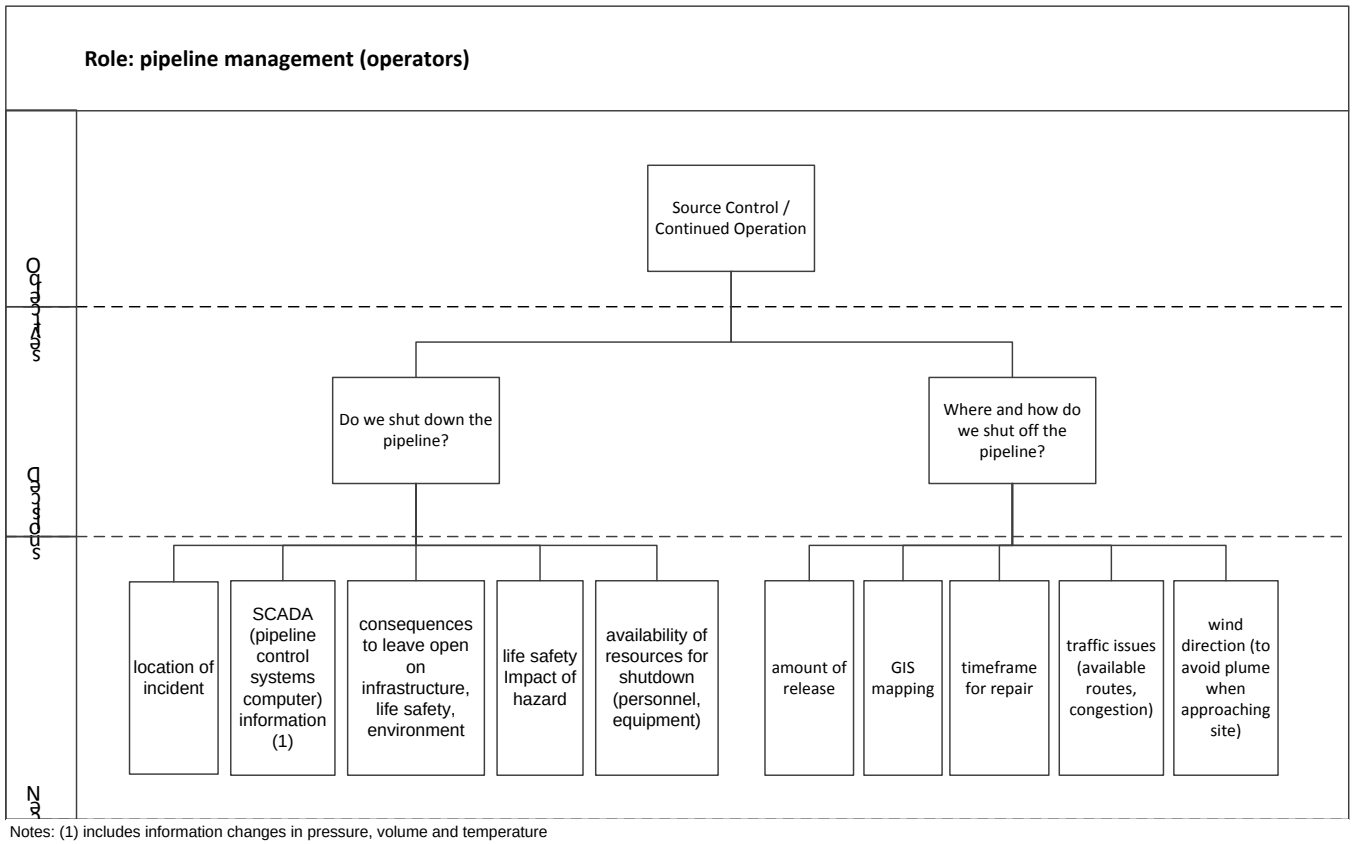
To determine what resources to send, the operator considers: (1) what resources have been requested by the respective agencies responding to the incident; (2) the extent of the release; and (3) the cause of the release. The specific nature of the problem or response scenario will determine what resources are dispatched (for example, odor in the area of the pipeline, third-party damage to the pipeline with no release, fire vs. leak scenario, etc.).

Pipeline Management

Pipeline operators also manage the pipeline, including how to control the source and whether to continue pipeline operations. There are two basic decisions associated with this management role: should the pipeline be shut down, as well as where, and how the problem area of the pipeline is isolated (valve location, automatic vs. manual valves). See Figure 3-3.

Containing the Release/Pipeline Shutdown

A pipeline release can be contained in two ways, closing off valves in individual sections of the pipeline, or by shutting down the pumps to stop the flow of matter. Operators consider the following types of information making the decision: (1) location of the incident; (2) line integrity and pipeline status (pressure loss, volume, temperature), available at the pipeline control center (SCADA); (3) effects on infrastructure, life safety, and the environment if the pipeline is not shut down; (4) life safety effects of the hazards (i.e., whether casualties could occur if the pipeline is not shut down); and (5) whether there are personnel and equipment available to shut down the pipeline and isolate the flow. See Figure 3-3.



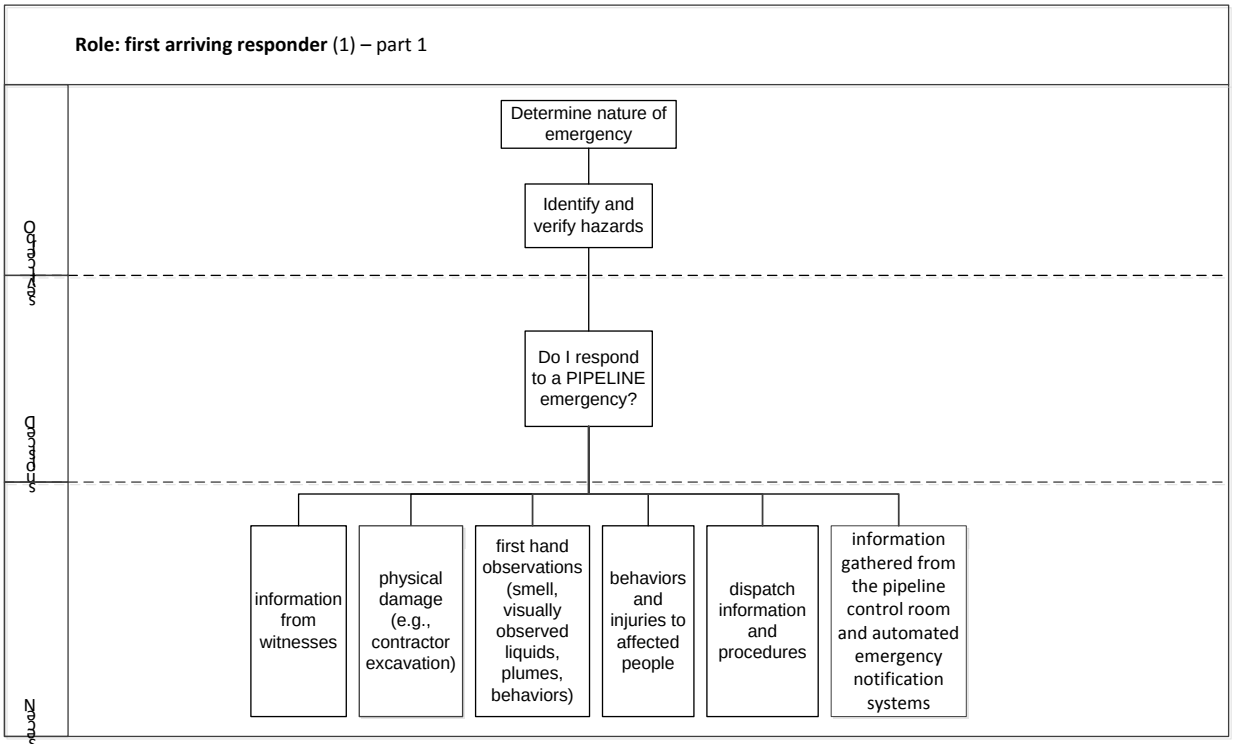
Notes: (1) includes information changes in pressure, volume and temperature

Figure 3-3. Pipeline Management

To make the decision about where and how to shut down the pipeline requires the following types of information: (1) SCADA and/or geographical information system (GIS)-based mapping information that can pinpoint the precise location of the release; (2) volume of product release; (3) current traffic conditions and available routes to the pipeline valve location; (4) projected timeframe for pipeline isolation and repairs; and (5) wind direction, so the site can be approached without exposing responders to hazards. Often, control room operators are required to interpret multiple data points in the SCADA system. Without reports from field personnel, the public, or emergency responders, they may not be able to accurately pinpoint the location of a leak. Small leaks may not even trigger alarms on the SCADA system.

First on the Scene

During the initial stages of a pipeline incident (Figures 3-4 and 3-5), the role of the first arriving responder (from the pipeline company or other public safety personnel) is assumed by either the pipeline operators or public safety agencies. Regardless of their organizational affiliation, these individuals have the same objectives: to identify, classify and verify the hazards associated with the incident, and to evaluate the risk to responders.



Notes: (1) Applies to both public safety agencies and pipeline operators

Figure 3-4. First arriving responder part 1

In order to coordinate an appropriate response, the first arriving responders assess the scope and nature of the problem. They must determine whether the incident is a pipeline emergency or involves some other type of facility or product (for example, petroleum products distribution facility, truck accident, train derailment, etc.). To make this decision, they need: (1) information from witnesses (smells, visual cues, physical damage, explosions, etc.); (2) their own personal observations of the physical clues and damage;

(3) any reports of physical damage (i.e., contractors conducting excavation work); (4) first hand reports of human behaviors and effects (such as confusion, fainting) and injuries (such as burns, respiratory distress) to anyone exposed to the hazard; (5) dispatch center information, including observations from witnesses and information about procedures that should be followed, and (6) information gathered from the pipeline control room and automated emergency notification systems. See Figure 3-4.

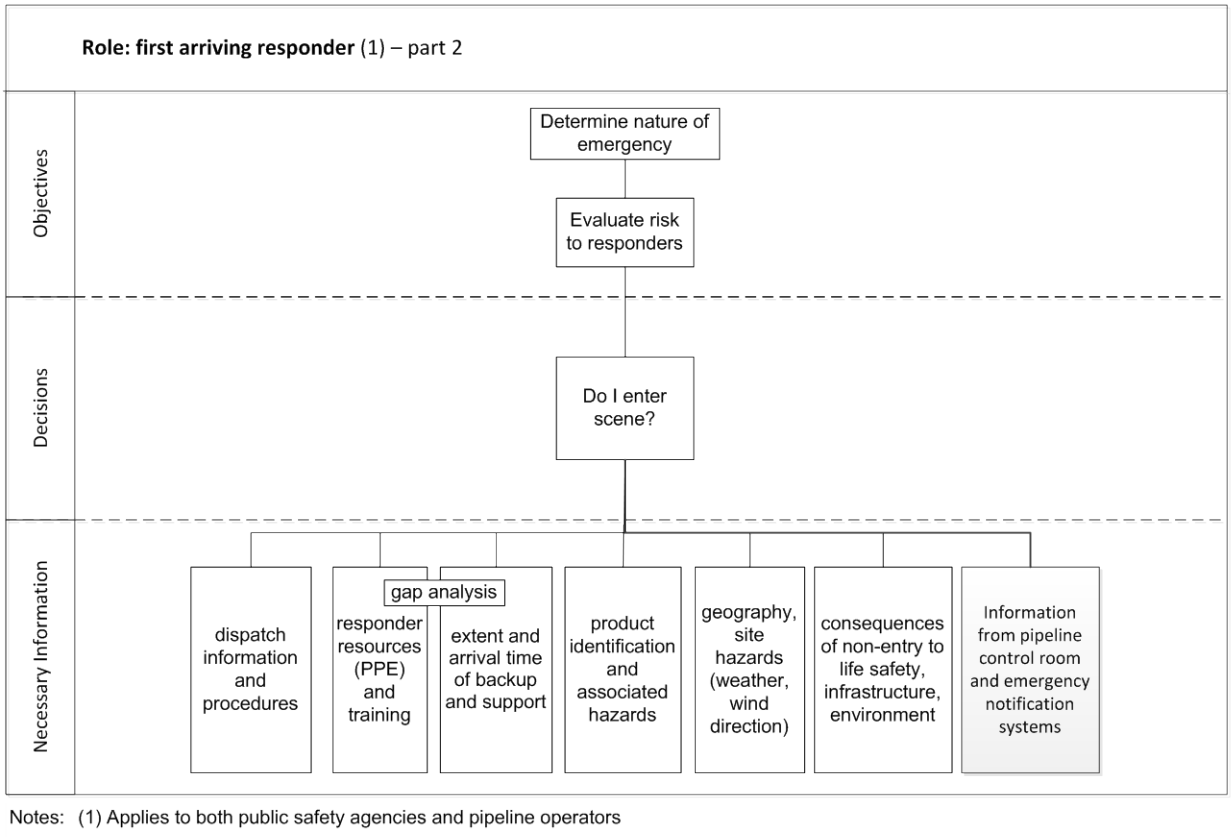


Figure 3-5. First arriving responder part 2

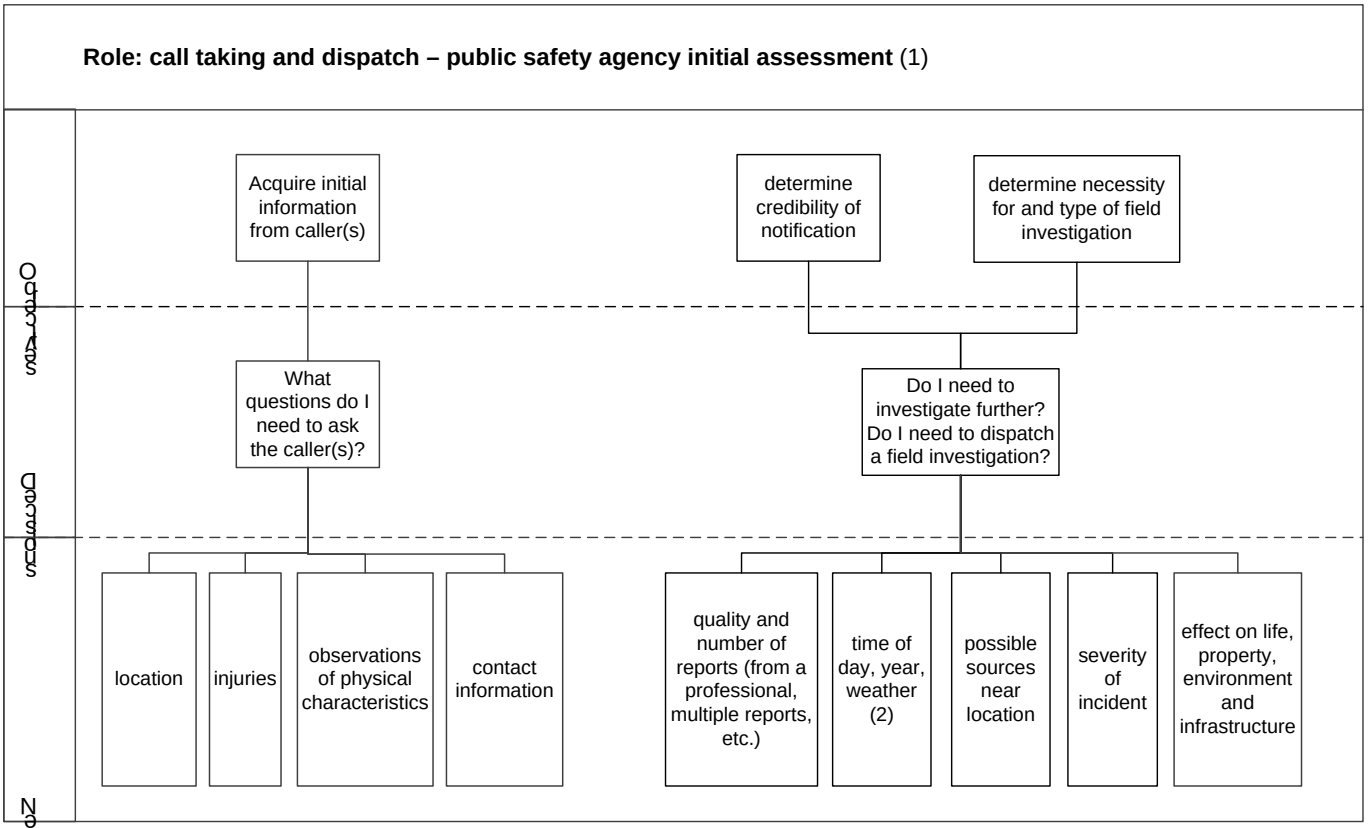
Once the first arriving responders confirm a pipeline incident, they must decide whether they should enter the scene. See Figure 3-5. This decision involves a subjective calculation of the risks to themselves and to the public at-large. Ideally, the following information is available for reference when making this decision: (1) available responder resources, such as personal protective equipment, and monitoring and detection equipment; (2) resources available on-site, resources to be dispatched, and timing of arrival for resources and backup support; (3) monitoring and detection results, visual cues, and physical observations about the type of product being released and the associated hazards; (4) influence of surrounding topography and weather conditions on the location and extent of hazards; (5) potential consequences to life safety, the environment, and critical infrastructure if they choose not to enter the site; and (6) dispatch information and procedures.

Incident experience shows that first responders will sometimes delay their initial actions until additional or specialized resources arrive to provide the information they need to enter the scene. This stems from an application of the precautionary principle that withholds intervention until information and hazards are identified and the risks evaluated. While the physical properties of a leaked pipeline product help identify a class or type of material, verification of hazards to personnel is essential for responder

safety. Even though first responders carry personal protective equipment, they must assess the incident in a safe manner.

Public Safety Dispatch Call-taker

The call-taker working for public safety answering point (PSAP) and the related dispatch services play an important role in the initial assessment of an incident. The call-taker provides information to emergency responders regarding reports by the pipeline operator and the first responders to the scene. The call-taker has three objectives: (1) acquire relevant and accurate information from the caller; (2) make initial assessment of the credibility of the notification; and (3) determine whether it is necessary to dispatch someone to the scene to initiate an investigation. Even if the initial call information is not an emergency, the call-taker can recommend or forward the information to other appropriate parties, such as 8-1-1. See Figure 3-6.



Notes: (1) initial assessment by pipeline operators is found in a different SA requirements tree: "initial assessment by pipeline operators"
(2) Examples include fog that can explain an observed mist and single calls made during times of day and isolated areas that are therefore more credible because there are fewer opportunities to report incidents.

Figure 3-6. Call taking and dispatch – public safety agency initial assessment

Call-taker Questions

The call-taker must decide what questions he or she needs to ask the caller; this decision making is a function of protocol involving the following types of information: (1) location of the incident and the caller; (2) any injuries that might have occurred; (3) any observations of the physical characteristics that

may be related to a leak or rupture, such as whether the release involves a gaseous or liquid product, smells and sounds, environmental damage, etc.; and finally, (4) contact information in the event more information is needed.

The call-taker should clarify the number and types of injuries. This will ensure that appropriate EMS resources are dispatched so hospitals can prepare for an influx of critical patients. Delays in EMS resource commitment due to lack of information from the call-taker may negatively affect patient outcomes.

Resources Needed

The call-taker, perhaps working with a supervisor in larger jurisdictions, will decide whether to investigate further. In most instances, the question will be answered in the affirmative. However, in some instances, it may not be necessary to investigate further, or the caller information may be forwarded to a non-emergency organization for follow-up and coordination such as 8-1-1. Information needed to make this decision are: (1) quality and number of reporting calls; for example, information from a public safety responder is more credible than a single call from a heavily populated area; (2) time of day, year, and current weather conditions (such as morning ground fog, which may be reported as a vapor cloud); (3) other possible sources near the location (for example, chemical and petroleum facilities' normal plant flaring operations, etc.); (4) severity of the reported incident; and, (5) potential impacts to life, property, environment and infrastructure, indicating a response is required.

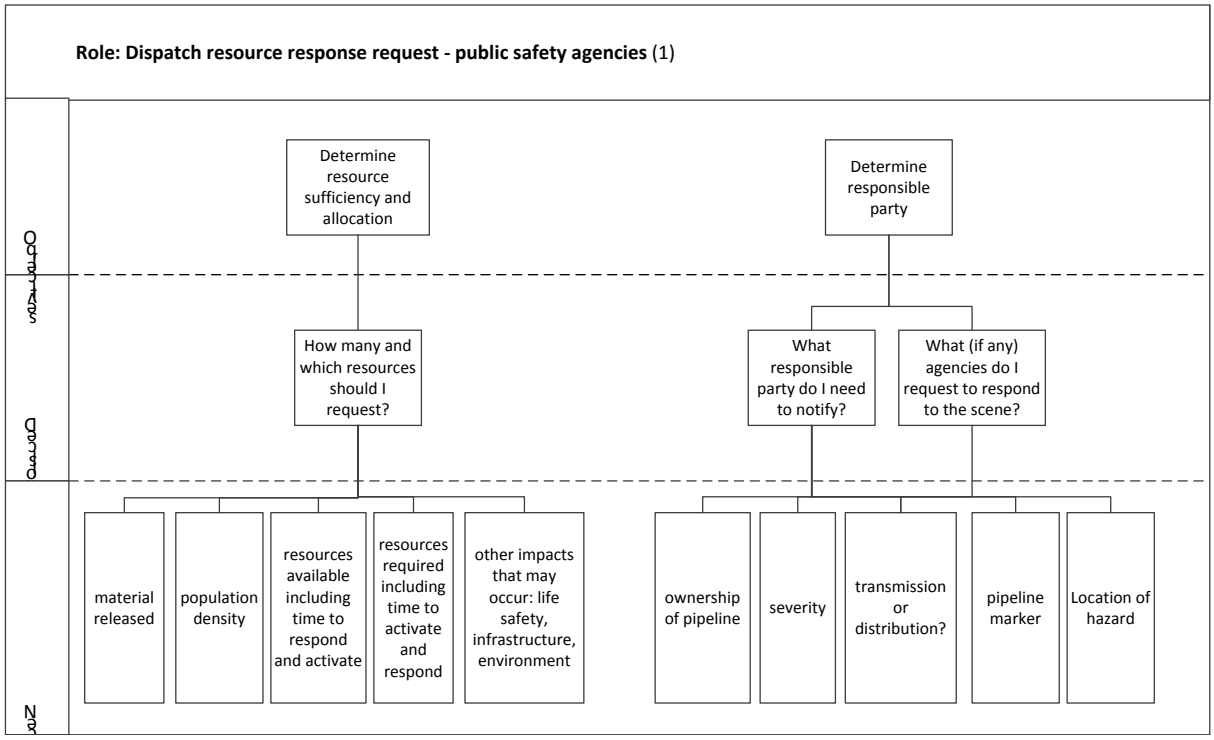
Public Safety Dispatch: Incident Commander

Once an incident is confirmed, the appropriate resources must be dispatched to the incident location. Based on the specifics of the incident, this role can be assumed by either the public safety dispatch center or by the on-scene Incident Commander. Two objectives are associated with this role: determining if the currently deployed resources are adequate or, if the response is insufficient, determining what additional resources should be requested. This may be accomplished through a combination of either direct requests from the Incident Commander, or through pre-determined local response assignments for different types of emergencies. This role requires responders to have knowledge of the amount and source of such resources. See Figure 3-7.

Resources Requested

The Incident Commander, or the dispatch center, must decide how many and what type of personnel and equipment to send. There are five key types of information required to make this decision: (1) type of material released, which will determine the type of equipment required; (2) density of population potentially exposed to hazards associated with the leak or rupture (in rural areas, for example, fewer resources will be required to carry out public protective actions); (3) resources available and their location, including the time it will take to mobilize the resources and arrive at the scene; (4) additional resources required when compared to available resources, which will determine whether additional resources should be requested (for example, in accordance with mutual aid agreements and/or from the pipeline operators); and (5) any other impacts that may occur on the surrounding environment or population (for example safe guarding vulnerable populations in health care facilities and schools requires more resources than general populations, or mitigating environmental damage might require specialized resources, such as barriers to a liquid spill).

When allocated resources prove to be insufficient, either the Incident Commander or the dispatch center needs to decide whether the currently deployed resources are sufficient or whether to request additional resources.



Notes: (1) resource requests by pipeline operators is found in a different SA requirements tree: "initial assessment by pipeline operators"

Figure 3-7. Public Safety Dispatch, Incident Commander

Agencies that Provide Resources

Local public safety agencies are not the only organizations capable of providing resources for a pipeline emergency. The pipeline operator, their agent(s), or contractors may also be responsible for and capable of providing additional resources. Other agencies, such as the public works department and emergency responders in nearby areas, might be needed. Depending on the extent of the hazard and any associated environmental damage, the Environmental Protection Agency and the U.S. Coast Guard might be called on for assistance. See Figure 3-7.

There are two associated decisions: what responsible party needs to be notified and which (if any) agencies will be requested to respond? Both of these decisions involve the same set of information: (1) ownership of the pipeline and responsible pipeline operator, this information may require help from operators, who must decide whether their company is responsible; (2) severity of the leak, rupture, or related hazards; (3) whether the problem is associated with a transmission or a distribution pipeline; (4) presence of, and writing on, pipeline markers; (5) location of the hazard concerning exposure to people, critical infrastructure, and the environment.

These decisions are complicated by the fact that multiple pipelines may be nearby or in the same right of way, and other utilities such as water lines, telecommunications or electrical cables may be involved.

Managing the Pipeline Emergency: Incident/Unified Command

Establishing effective coordination and communication among all involved parties is critical to the success of the overall response as an incident develops and its scope increases. Other stakeholders may become involved beyond the public safety and pipeline industry organizations directly responding to the incident, such as local emergency management personnel, local elected officials, the news media, and property and/or facility managers. Coordination should follow the basic principles of the National Incident Management System (NIMS), with on-scene coordination facilitated through the establishment of an Incident Command Post (ICP) and a unified command organization, as appropriate. Given that agencies and companies with different reporting structures will probably be involved, a *unified command* is likely to be required to reconcile conflicting goals among stakeholders and to share information.

Depending upon the size and scope of the pipeline emergency, the locus for coordination among involved parties may be onsite at the ICP, offsite at an Emergency Operations Center (EOC), or both. Three key decisions may be involved: (1) do we need to activate the local or county EOC; (2) how do we establish interagency coordination and what means of communication should we use; and, (3) what additional resources do we need to request? See Figure 3-8.

EOC Activation and Interagency Coordination

To determine whether the incident has grown to a level requiring involvement and activation of an emergency management agency, or other public agencies, requires the same essential types of information: (1) knowledge of which emergency support functions (ESF) have already been activated for the incident (such as the deployment of local police and fire responders); (2) resources available locally and anticipated incident or additional resource needs; (3) the number of people likely to be affected; (4) the nature and severity of the release; (5) the likely duration of the event; and (6) potentially affected infrastructure (such as hospitals, schools, transportation corridors, etc.).

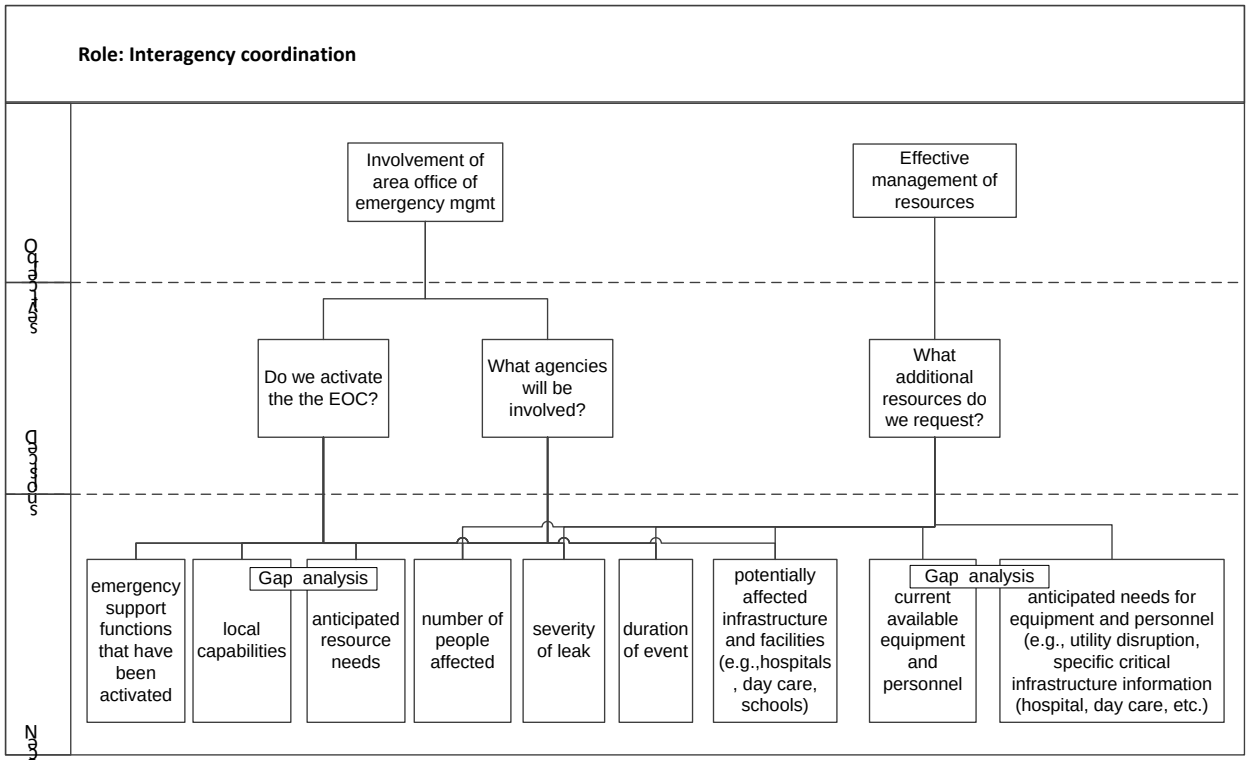


Figure 3-8. Managing the Pipeline Emergency: Incident/Unified Command

Additional Resource Needs

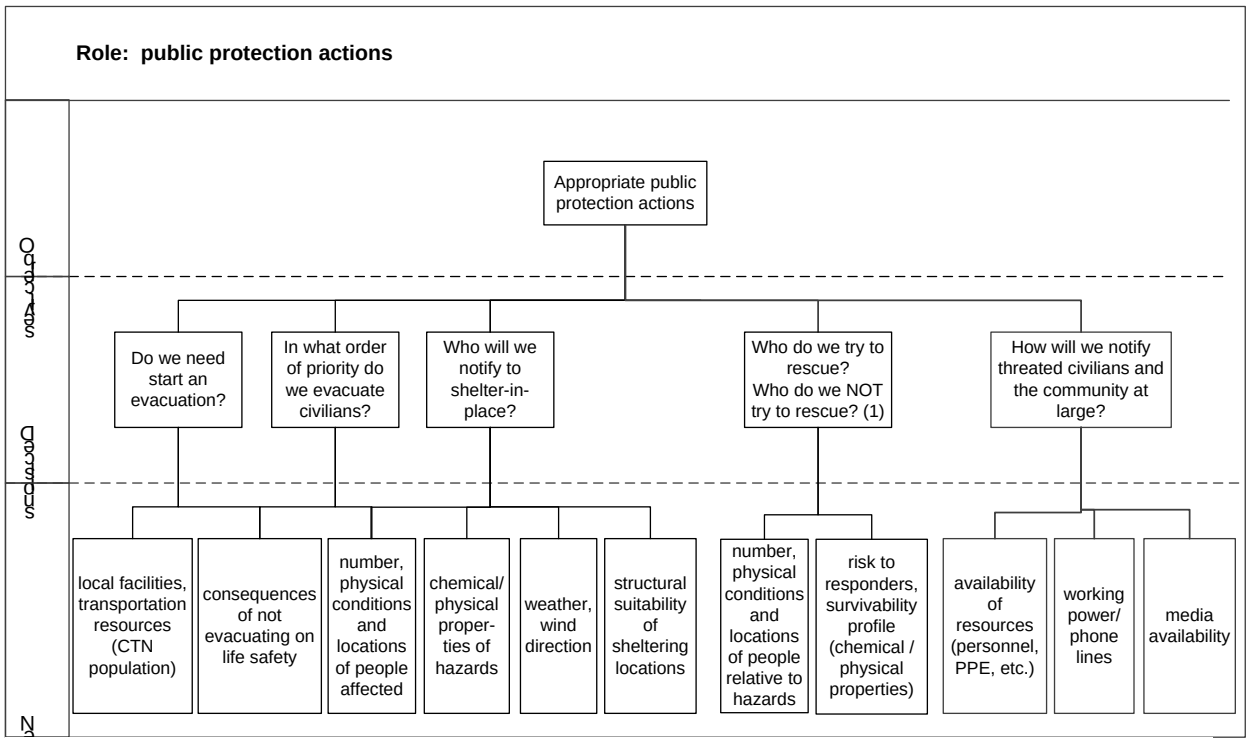
The information needed to answer the question about additional resources is similar to that required for activating an EOC and requesting additional agency assistance: (1) understanding of the number of people likely to be affected; (2) nature and severity of the release; (3) likely duration of the event; (4) potentially affected infrastructure, such as hospitals, schools, transportation corridors, etc.; (5) currently available equipment and personnel, as compared to (6) the anticipated needs for equipment and personnel. See Figure 3-8.

The decision making and informational needs are similar to dispatch resource requests, except at this level the incident will have progressed and increased in scope sufficiently to require a unified command structure involving a variety of stakeholders. Knowing the number of people impacted by an incident will help determine which emergency support functions must be activated and coordinated. County and state emergency management agencies' knowledge of which emergency support functions have already been activated could improve their coordination.

Public Protection Actions

Implementing public protection actions (for example, evacuation or shelter-in-place) is likely to involve a combination of fire service, law enforcement, and emergency management personnel. In addition, other non-governmental organizations (such as Red Cross) may be involved in supporting evacuation and sheltering operations. All forms of media (traditional, social media, advanced technological tools, etc.)

may be used to provide citizens and stakeholders with information and recommendations on the appropriate public protective actions to take. See Figure 3-9.



Notes: (1) For additional detail, see the information requirements tree for search and rescue in appendix __

Figure 3-9. Public Protection Actions

Public protective action decision-makers need to determine who to evacuate, who should be advised to shelter where they are, and who can be left alone. There are five actionable decisions associated with the role of managing public protection actions (1) do we need to start an evacuation; (2) in what order of priority do we evacuate civilians; (3) who do we notify to shelter-in-place; (4) who do we try to rescue, and (5) how do we notify the community at large, and civilians who may be threatened as the incident develops?

Evacuate or Shelter-in-Place

To make informed decisions regarding whether to evacuate, prioritizing civilians in an evacuation, and sheltering in place require the same type of information:

Availability of facilities/resources. It is necessary to obtain information regarding the availability of local facilities and transportation resources, if civilians need to be relocated from a relatively large area or a high-population facility such as a school or nursing home. Technology and resources that may assist in this assessment include Computerized Telephone Notification systems (CTN) (such as Reverse 9-1-1®, Alert Logic®, etc.).

Probability of exposure. The life safety consequences of not evacuating certain civilians due to possible exposure must be considered. If civilians are not endangered then there is no need to start an

evacuation. However, if evacuation is necessary, involved organizations must account for the diversion of considerable personnel and other resources, public inconvenience and potentially public panic. Such a decision requires a conservative assessment. It is important to gauge risk by evaluating the probabilities of exposure and the consequences if persons are exposed as well as the emergency responders.

Location and condition of population. The number, physical conditions, and locations of people affected by the incident and release must be considered. The location of people relative to the hazard is critical information required to determine emergency responses and to avoid potential consequences. People in close proximity to the hazard may not have time to evacuate and will have to shelter-in-place. Others, sufficiently remote from the hazard, can be advised to shelter-in-place because they are less likely to be exposed to significant transient hazards when they remain indoors.

Civilians' physical conditions may require special transportation or personal assistance due to injuries sustained during the incident or due to inabilities and disabilities that existed prior to the incidents, including age-related mobility problems, sight and hearing disabilities and temporary disabilities such as broken limbs and late pregnancies.

Properties of hazardous material. The physical and chemical properties of the products/hazardous materials involved will also influence evacuation decisions. The relationship between the hazards of the released materials (such as toxicity, flammability, etc.) and the duration of potential exposures are important variables.

Weather conditions. Weather may interact with the released materials to affect the extent and concentration of hazards. In particular, the hazard to persons downwind from a release is obviously much greater than the potential harm to those upwind of the location. Wind direction and speed determine how quickly a population is exposed. It is an important factor in determining whether there is sufficient time to evacuate, or whether people will need to shelter-in-place.

Structural suitability. Structural suitability of the workplace or dwelling is a significant factor in the decision to shelter-in-place. Buildings with HVAC systems that can be shut off; windows and doors that can be closed obviously make more suitable locations for evacuees than buildings that lack these features. Sheltering locations can also interact with the physical characteristics of hazards. For example, where air-borne hazards are heavier than air, people can be advised to move to upper floors of a building and advised to not shelter in their basements.

Rescue Efforts

Rescuing civilians is a difficult calculation that involves weighing the likelihood of success against the risks assumed by first responders. The decision requires following types of information:

Proximity to exposure. The number, physical conditions and locations of people relative to the hazards of an incident are needed. The physical condition of victims is needed for triage preparation.

Risk to responders. The risk to responders is determined by the survivability profile of the hazard. If there is any risk to responders, it is inadvisable to rescue persons very unlikely to survive. Persons who likely succumbed to hazards are also a lower priority. Fire fighters are taught to evaluate the survival profile of trapped building occupants. For example, during a fire or explosion resulting from a natural gas leak attempting to rescue people is ill-advised in buildings where conditions are rapidly deteriorating or

when a structural collapse is imminent. The same logic applies to toxic environments, although these can be more difficult to assess than fire hazards.

Rescue operations require the application and use of a risk-based response process. NFPA 472 *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents* defines this as a systematic process by which emergency responders analyze a problem involving hazardous materials, assess the hazards, evaluate the potential consequences, and determine appropriate response actions based on facts, science, and the circumstances of the incident. The application and use of monitoring and detection instruments, and the interpretation of their results, are critical elements of a risk-based response process and directly impact both the selection and use of personal protective clothing, equipment, and tactical response options.

Notifying the Public

Public notification can be important in the event of a pipeline emergency. Most critically, information on evacuation, closing windows, or other protective actions must be taken. Effective dissemination of information early in the incident can reduce the burden on 9-1-1 centers to field multiple calls asking the same questions. Improvements to public warning and the Emergency Alert System (EAS) including implementation of Integrated Public Alert and Warning System (IPAWS) by FEMA and the geographically-targeted text messaging capability of Wireless Emergency Alerts (WEA) show great promise for enabling timely and effective notification (for more information on IPAWS and WEA, refer to http://www.fema.gov/integrated-public-alert-warning-system and http://www.ctia.org/consumer_info/safety/index.cfm/AID/12082). While new technologies such as social media are increasingly being used, their effectiveness for urgent notifications is still being assessed.

The key points are as follows:

- There are a number of tools at the disposal of local emergency management agencies, all with advantages and limitations. Examples of such tools include direct notification, CTNS, social media, sirens and warning systems, use of the radio and TV media.
- Regardless of what public protective action is pursued, there is a need to provide continued information to the public and those impacted by the incident. This includes notification that the emergency is terminated, when they can go home, and what actions, if any, they need to take once they get home (for example, ventilate their home).

Deciding how to notify civilians regarding the status of an incident, evacuating or sheltering-in-place is difficult, especially during the early phases of an incident when there may not be adequate information. This decision is dependent upon three types of information:

Availability of resources. In particular, finding the personnel to go door-to-door is an acute problem early in an incident. If there are dangers of exposure to hazards, then the availability of personnel protective clothing and equipment must be determined to avoid unacceptable risks to responders.

Availability of electrical power and intact phone lines. Community alert systems have the potential of greatly improving the ability to notify civilians who may be exposed without unnecessarily alarming unaffected people.

Availability of media. During a prolonged event, the public information officer can brief media representatives who can disseminate information via television and radio. Reporters often converge at the scene early in an incident. These reporters can be recruited to relay information to the public.

The Information Flow Analysis

Information flow analysis, a means of modeling a generic pipeline emergency response communications system, was the third phase of this project. This phase involved developing and distributing questionnaires to the participants of the SAIRA workshops. The questionnaire was designed to collect information about the sources of information and how the information might be transmitted to persons assuming key response roles. The questionnaire asked workshop participants to complete entries in a table, an example of which is shown below.

Recipient role (target for information)	Decision(s)	Required information	**Sources for information**	**Intermediaries**	**Means to convey information**	**Comments**
Control unintentional threats	Can we dig here?	Location of pipelines	Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

Three versions of this questionnaire were developed. The first questionnaire was sent to participants in the New Jersey workshop. Because the number of roles, and the resulting length of the questionnaire, which expanded after the Texas workshop, we develop two separate questionnaires that we sent to participants in the Texas workshop. To keep the length of both questionnaires manageable, we only included roles that are assumed during the development of a pipeline emergency. Participants in the Texas workshop were divided by whether they represented pipeline operators or public safety and Federal response agencies. The pipeline operators received a version of the questionnaire focused on roles that their organizations might have to assume during the early stages of a pipeline emergency. Similarly, the public safety and Federal agency representatives received a version including only the most relevant roles.

Just prior to our assigned deadlines for returning questionnaires, we reminded workshop participants by sending emails and making telephone calls. We received responses from seven participants for a response rate of 23%. (Two of the questionnaires were completed by two persons representing the same organization for a total of five returned questionnaires.)

Findings from the returned questionnaires were difficult to interpret because respondents listed a great many possible sources of information and means to convey that information. We attribute the problem as probably reflecting the likelihood that emergency response planning does not typically include specific details about the sources of information and how these will be transmitted from the sources to the recipients who need to make key actionable decisions. As a result, the respondents probably listed all the possible sources of information and all of the possible ways that the information could be conveyed. We believe that this likelihood reinforces the importance of the project—that key pipeline operator and public safety responders need guidance about how to plan to transmit and receive timely and essential information during pipeline emergencies.

Example of an information flow analysis in a local jurisdiction

As noted in Chapter 2 covering the research approach, our efforts to identify a generic set of information flows did not yield a coherent set of findings. Our response rate for the information flow

analysis was very low. Our inability to generate a set of generic information flows probably resulted from the considerable variations in sources and means to convey information from one locale to another.

Because we were unsuccessful in modeling a *generic* information flow for pipeline emergencies, we decided to pilot a localized approach. This chapter provides an example where information flow data was collected and modeled for a single area—a county in New Jersey. (Suggestions are made for how similar analyses might be conducted locally in Chapter 4 of this report.)

A project team member met with three experienced currently active and retired emergency responders who worked for fire departments in New Jersey municipalities. With the project team member as a facilitator, the group completed the same type of data collection table used in the questionnaire. The session was highly collaborative and involved extended conversations among the three emergency responders and the project team member. After collecting the data, the project team member represented the data as information flow diagrams. These were provided to the emergency responders for comments (all indicated that the diagrams were accurate).

Figure 3-10 is an illustrative example of how information flows can be represented using a simple diagram. The same findings can be written out in a narrative format or presented in a table, but a diagram is more easily understood and its creation requires only some proficiency using an appropriate software application (for example, Microsoft Word, Excel, or Visio®.)

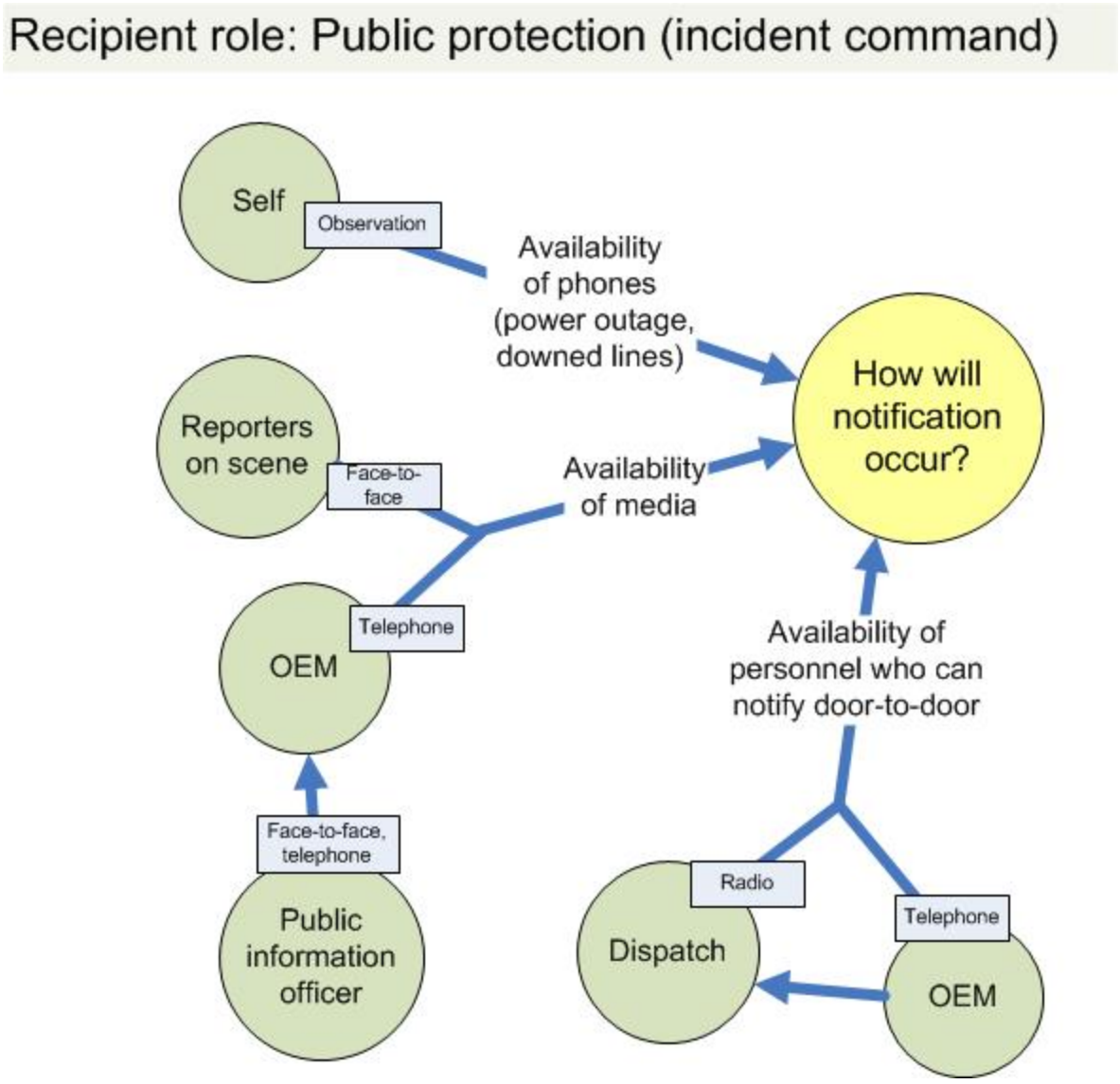


Figure 3-10. Sample Information Flow Diagram

The diagram shows the flow of information involved in the decision process about how notification about an incident will occur (a decision that will be made by the Incident Commander). The decision is shown in the yellow circle; the sources of information are shown in the green circles. The arrows connecting the sources and the recipient are labeled with the type of information provided to the incident command. The small rectangles show the means by which information is transferred; in some cases by face-to-face interactions, in other cases by the use of technology. In some instances, there may not be a direct link between the source and the recipient. In this diagram, a public information officer is the information source regarding the availability of the media, but the information is passed through the local office of emergency management before it reaches the incident commander.

Data collected for an information flow analysis can also be used to represent the types of information that will need to be provided by someone in a particular role. Representing the information flow from a source is valuable because it helps people to prepare information and relay it in a timely manner when it

is of most use to other in making actionable decisions. As noted in the next section covering the results of the failure modes and effects analysis, failures to collect information and to send it in a timely manner were judged to be the mostly likely causes for breakdowns in communications during pipeline emergencies. As shown in Figure 3-11, the types of information that need to be provided by some in the incident command roles is shown, along with the types of information and the intended recipients of the information.

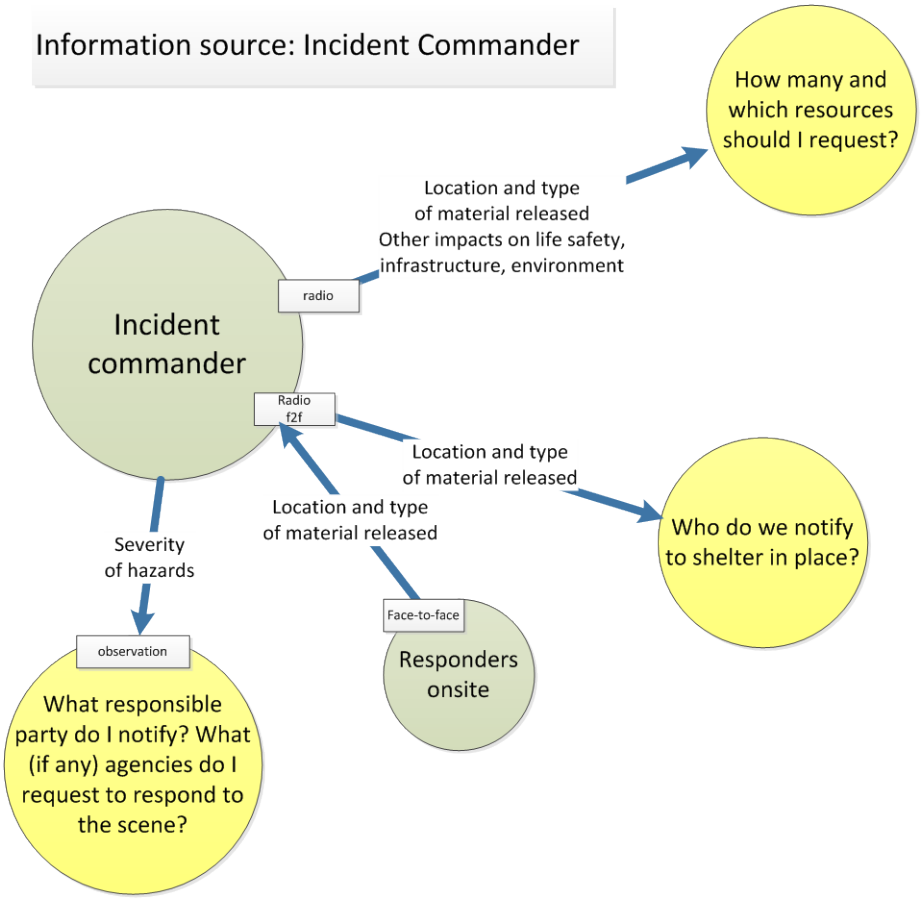


Figure 3-11. Information flow analysis for role providing information to other roles

The Failure Modes and Effects Analysis

The fourth and final phase of this project was to conduct the Failure Modes and Effects Analysis. Using FMEA, we analyzed the ways that a system's components can fail (i.e., the failure modes), along with the likelihood that such failure modes will occur, and the effects on the system's ability to fulfill its functions when components do fail. A set of research questions is used to organize the findings from the failure modes and effects analysis.

The project team first developed a list of failure modes. The attempt was to find a list of failure modes that would be mutually exclusive, comprehensive, and as short as possible. The list of failure modes generated by the project team is shown in Table 3-3.

Table 3-3. Failure modes and definitions

Failure mode	Definition
Info not collected	The information does not exist, or the potential source of the information does not collect, assemble or observe the needed information.
Recipient unknown	The original source of the information, or whoever is supposed to forward the information, does not know to whom the information should be sent.
Source unknown	Whoever needs the information does not know who to request it from.
Request poorly communicated	The request from the recipient is unclear; the exact information required is not clear to the source.
Info not sent or poorly expressed	The source of the information does not express the information clearly; only part of the information is transmitted; the information is inaccurate.
Value of info unclear	The recipient does not understand the importance or value of the information; the source of the information is unclear; the source of the information is not trusted.
Info sent too late	The source does not collect and send the information soon enough to be useful in making the decision.
Technology unavailable or fails	Information cannot be sent because the source or the recipient does not have the available technology; the equipment lacks interoperability; the means of transmitting the information is unreliable.

What are the most likely failure modes? What failure modes are associated with greater criticality?

Table 3-4 shows the failure modes ranked by the likelihood that they will occur. Lower values mean a greater likelihood of failure. Ratings of criticality were obtained by multiplying the panelists' ratings of failure mode likelihood by the ratings of the degree that missing information would prevent someone from making each identified actionable decision. The values shown in the table are averages across all types of information for each failure mode.

Table 3-4. Failure modes ranked by likelihood and criticality

Failure Mode	Likelihood	Criticality
Info not collected	1.77	3.23
Info sent too late	1.99	3.60
Technology unavailable or fails	2.11	3.82
Request for information poorly communicated	2.14	3.89
Info not sent or poorly expressed	2.30	4.19
Source unknown	2.36	4.31
Recipient unknown	2.41	4.37
Value of info unclear	2.45	4.49

Note: Lower values denote a greater likelihood of failure and a greater level of criticality

The rankings of criticality exactly replicated the rank order of the likelihood that failure modes will occur. During the workshops, all of the types of information were selected because they were important to making actionable decisions. Therefore, the ratings of criticality were insensitive to the ratings of consequences, but sensitive to the ratings of likelihood of occurrence.

The ways information will fail to reach the recipient who needs it are:

1) The information is not collected in the first place; and
2) The information is sent too late. Both of these failure modes reflect preparedness problems among persons who are the sources of information. Persons who should transmit information may be unaware that it is needed by someone else, or they may simply be so caught up in their immediate responsibilities that the information is not sent early enough in an incident. An information flow analysis is used to provide solutions to communication breakdowns in the system; it is designed to reveal both the sources of information needed during a pipeline emergency and the reliable means to convey that information
3) The probability is that technology will fail. Advances are forthcoming in equipping public service agencies, and perhaps pipeline operators, with interoperable devices that can transmit text and visual information, as well as voice. In the meantime, it is important to employ whatever technology is available to relay information. Cell phone (voice calls and text messages), emails, landlines and radios are all possibilities depending on local resources. Where interoperability is not possible, intermediaries need to be available to transfer information from one system to another. For example, when radios owned by different agencies are operating on different frequencies. Of course, it is not enough to transmit information; it is equally important that the intended recipient actively monitors the technology used to transmit messages.

The next two failure modes involve imprecise and potentially confusing message content:

4) The recipient sends a request for information that is poorly expressed.
5) The source either fails to send the information or the content of the message is poorly expressed. Apart from imprecise and vague content, recipients may fail to explain why the information is needed, thereby preventing the source from prioritizing the information appropriately. The Situation Awareness Information Requirements Analysis shows the importance of expressing the

context of informational requests—the goals and decisions that are inhibited when timely and accurate information is unavailable.

6) The recipient does not know the source of needed information.
7) The source does not know who needs to receive the information. Both failure modes involve the problem of knowing the identity and contact data for the other party in an information flow.

The least likely failure mode as viewed by the FMEA panel is…

8) The recipient does not understand the value of the received information or questions the credibility of whoever provided the information. While this failure mode was rated as the least likely to occur, the panel still rated it midway on a five-point scale, meaning that they generally judged it as neither more nor less likely to occur. The rating indicates that a failure to understand the value of information is still an important problem, albeit judged as less likely than other failure modes. The SAIRA was used in this study to understand the exact significance of "required" information—what decisions it is used for and what goals need to be pursued.

What are the actionable decisions most vulnerable to not receiving needed information?

Some actionable decisions are likely to be more vulnerable to failure modes than others, which prevent recipients from getting needed information. Table 3-5 shows actionable decisions sorted by the mean value across all types of failure modes. (Lower values mean a greater likelihood that information will not be received.) The decisions with the highest probability that needed information will not be received concerns public protective actions.

The first is, "Who do we try to rescue? Who do we NOT try to rescue?" It is difficult to acquire the information needed to make these decisions in a timely manner. Given the urgency associated with public protective actions and the lack of available personnel during the early phases of a pipeline incident, it makes sense that it can be difficult to receive the required types of information for both of these decisions.

Table 3-5. Decisions sorted by mean values across all types of failure modes

Functional label for role	Actionable Decisions needed to fulfill role	Mean likelihood of failure
Public protective actions	Who do we try to rescue? Who do we NOT try to rescue?	1.90
Public protective actions	How do we notify civilians?	1.97
First arriving responder	Do I respond to a PIPELINE emergency? (Or is it something else?)	1.99
Public safety call taking and dispatch	What questions do I need to ask the caller(s)?	2.03
Control pipeline release	Do we shut down the pipeline?	2.09
Dispatch/ Incident Commander resource response request	If pipeline incident confirmed, what type of resources and how many should I request?	2.09

Public protective actions	Do we need to start public protective actions (evacuation or shelter-in-place)?	2.12
Control pipeline release	Where and how do we shut off the pipeline?	2.15
Interagency coordination	How do we establish interagency coordination? What agencies will be involved?	2.15
First arriving responder	What are my initial actions?	2.16
Dispatch/ Incident Commander resource response request	What responsible party do I need to notify?	2.22
Public safety call taking and dispatch	What resources, if any, do I dispatch?	2.23
Federal and State support for environmental protection	Will State or Federal Assets (EPA or USCG) respond to the incident?	2.33
Initial receipt of notification by pipeline operator	What public safety, state and Federal agencies ask to respond?	2.35
Initial receipt of notification by pipeline operator	Who will we send from the pipeline company?	2.55
Initial receipt of notification by pipeline operator	Do we need to respond? (Is this our pipeline?)	2.58

Note: Lower values denote a greater likelihood of failure

The second is, “How do we notify civilians?” The nature of the problem differs depending on whether notification must occur early in an incident, or later in an incident where a larger geographical area is likely to be involved. Early in an incident, information about the availability of resources is critical, but it can be difficult to obtain. It requires an assessment of the availability of personnel who can be spared to go door-to-door to advise citizens about whether they need to immediately evacuate or shelter inside their homes or businesses. Resources such as personal protective equipment, such as respirators, may be required to protect responders who are notifying the public. In a longer time frame, households and business can be telephoned, assuming that phone and electrical infrastructures remain operational. Media can be used to help advise citizens who may be in danger. While the information can be relayed to the media through a public information officer, reporters are often on scene relatively early in an incident, and can be contacted directly by the Incident Commander or a representative. Additionally, new technologies become available, including reverse 9-1-1 telephone calling and targeted text messages and emergency alerts. The difficulty of notifying and advising the public during pipeline and other hazardous materials incidents is a good argument for funding the adoption of these rapid and targeted risk communication technologies.

Nearly as difficult as the public protection decisions, are the first arriving responder decisions, particularly when judging what type of situation they have encountered. Information needs to be acquired from many potential sources; witness reports, assessment of physical damage at the site, observations made by the responder and information from dispatch. Because there are so many types of information, it is worth noting which are least likely to be acquired in a timely and accurate manner as rated by the FMEA panelists. Average values for failure modes by types of information are shown in Table 3-6. The likelihood that information may not be received depends little on the source of that information. However, the likelihood that various failure modes will occur does differ, with information not being collected as the most likely failure, followed by receiving the information too late. In fact, the order of failure modes

that affect first arriving responders is very similar to the order failure modes across all types of decisions and sources, as reported in Table 3-4.

At the other end of the rank order are decisions where information is most likely to be available within an acceptable time frame. As rated by the FMEA panel, this includes pipeline operators when they first receive notification that there is a possible leak or rupture. However, it is important to note that receiving timely and accurate information was on average still rated between the "likely" and the "neither likely nor unlikely" categories. None of the decisions were viewed as immune to the problem of receiving accurate and timely information.

Table 3-6. Average values that failure modes will occur for the sources of information

	Info not collect-ed	Recipient unknown	Source un-known	Request poorly communi-cated	Info poorly express-ed	Value of info unclear	Info sent too late	Technology unavailable or fails	Averages
Information from witnesses	1.38	2.23	2.23	2.00	2.38	2.62	1.23	1.85	1.99
Physical damage	1.31	1.92	2.15	1.85	2.54	2.75	1.54	1.62	1.96
First hand observation	1.31	2.46	2.15	1.92	2.62	2.23	1.54	1.62	1.98
Dispatch information and procedures	1.23	2.31	2.38	1.92	2.62	2.08	2.12	1.54	2.03
Averages	1.31	2.23	2.23	1.92	2.54	2.42	1.61	1.66	

Note: Lower values denote a greater likelihood of failure

Which roles have the most difficulty receiving timely and accurate information?

Table 3-7 shows the functional roles ranked by the average likelihood that recipients will fail to receive timely and accurate information. It is notable that the range of the likelihood of failure is relatively small; receiving information is problematic for all of the functional roles. For emergency responders, public protective actions and how the first arriving responder reacts are the most likely roles to have problems obtaining information. For pipeline operators, the information needed to decide how and where to control the pipeline release appears the most difficult to receive.

Table 3-7. Roles ranked by difficulty receiving timely and accurate information

Roles	Likelihood of failure averaged across decisions and failure modes
Public protective actions	2.00
First arriving responder	2.08
Control pipeline release	2.12
Public safety call taking and dispatch	2.13
Dispatch/ Incident Commander resource response request	2.15
Interagency coordination	2.15
Federal and State support for environmental protection	2.33
Initial receipt of notification by pipeline operator	2.49

Note: Lower values denote a greater likelihood of failure

Which types of information are least likely to be received in an accurate and timely manner?

Table 3-8 shows the five types of information that are the most vulnerable to failures. Three types of information are associated with the role of providing public protective actions; two are associated with controlling the release of products from pipelines with leaks or ruptures. In an earlier section, we discussed the difficulty of obtaining information necessary to make decisions about evacuating and sheltering civilians from pipeline-associated hazards. Also problematic is acquiring the information needed to make decisions for persons in the role of controlling the release of materials from pipelines: “Do we shut down the pipeline?” and “Where and how to we shut off the pipeline?

Table 3-8. Information least likely to be received in an accurate and timely manner

Functional label for role	Actionable Decisions needed to fulfill role	Types of information needed to make decisions	Average likelihood of failure
Public protective actions	How do we notify civilians?	Availability of resources (e.g., personnel, PPE)	1.77
Control pipeline release	Do we shut down the pipeline?	Impact of hazard on environment, life safety and infrastructure if pipeline is not shut down	1.81
Control pipeline release	Where and how do we shut off the pipeline?	Wind direction (to avoid plume when approaching site)	1.82
Public protective actions	How do we notify civilians?	Working power/phone lines	1.83
Public protective actions	Who do we try to rescue? Who do we NOT try to rescue?	Risk to responders, survivability profile (chemical, physical properties of hazards)	1.90

Note: Lower values denote a greater likelihood of failure

Consistent with findings discussed earlier, public protective actions taken by emergency responders and pipeline control assumed by pipeline operators were judged as the roles least likely to receive accurate and timely information. Table 3-8 provides some additional details.

The availability of resources for public protective actions was judged to be the most difficult type of information to acquire, followed by concerns of the impact the hazards will have on the environment, life safety and infrastructure if pipeline is not shut down. Pipeline operators hesitate to disrupt supplies to customers given the associated costs and inconveniences. They are likely to shut down pipelines whenever there is an apparent threat to life safety, but calculating the tradeoffs concerning threats to infrastructure and especially the environment are less straightforward. This decision is clearly difficult to make given the many types of information needed to build an overall situation assessment that can adequately represent the trade-offs of conflicting objectives. The extent and nature of the hazard, the presence of people and infrastructure are clearly relevant. Also needed is information about environmental sensitivities that can complicate damage assessments and cleanup difficulties.

Types of information ranked subsequently, in order of information most difficult to obtain in an accurate and timely manner are: wind direction, working power lines and phone lines, and potential risk to responders.

Wind direction affects the decision of how to shut down the pipeline. It can change unexpectedly making it difficult to predict or control some aspects of the pipeline release or to assess the dangers to responders and citizens. Communications infrastructure (working power line and phone lines) falls under the function of public protective actions. How would civilians be notified if those modes of communication fail? Finally, the difficulty of ascertaining the risk to responders when trying to decide whether they should attempt to rescue potential survivors, and survivability profile (discovering the chemical and physical properties of hazards) were noted by the panelists.

CHAPTER 4

Conclusions and Suggested Research

The Critical Role of Communication

Communication at pipeline emergency incidents can be complex, and includes communication within pipeline companies, between pipeline companies and emergency responders, among emergency response organizations, and between the public and public safety answering points (9-1-1 centers). This web of organizations and their communications flows illustrate the complexity of communications for pipeline emergency response. Each of the parties plays an important role, and the effectiveness of communication between and within the roles is crucial to the successful response to a pipeline emergency (Figure 1-4).

Identifying the product involved, particularly where multiple pipelines may be in the area or within a common pipeline right-of-way, is another key piece of information that must be determined. Knowledge of the pipelines and products carried, especially among public emergency services, can greatly ease the process of determining that a call for an unknown odor, sounds, or other physical manifestation of a release is a pipeline emergency, thereby shortening the time to notification of the pipeline operator and the dispatch of appropriate public safety and industry resources.

Federal agencies provide guidance, such as the National Incident Management System (NIMS), which is a framework for sharing information. However, these frameworks focus on the strategic-level process of information sharing and do not generally include the content of tactical-level information that needs to be shared. Specifying the content of communications is an important component of effectively planning for, and responding to, pipeline incidents. Personnel in key roles need to know what information to request and what information to provide.

Lessons Learned: NTSB suggestions for improved communications

Basic human senses – sight, smell, and sound - have proven to be important initial sources of information immediately following, and even prior to, a pipeline rupture that mobilize nearby people and emergency responders (San Bruno, CA, Rancho Cordova, Carmichael, Kingman, Edison, Bergenfield, Marshall). These initial reports based on human observation are a critical part of the initial stages of emergency response. They need to be verified and conflicts among different reports resolved quickly.

Additionally, the use of portable and fixed monitoring/detection equipment by emergency responders appropriate to the circumstances is critical as a source of information for communications and subsequent action. Availability, proper calibration and condition of this equipment are important, and adequate training in the use of this equipment is imperative (St. Cloud, MN; Rancho Cordova, CA).

Communicating information to emergency responders about the characteristics of a facility and pipeline system, such as historical incidents that may affect conditions of the pipelines, is a critical aspect

of prioritizing surveillance and response action. Proper documentation of this information has been highlighted in a number of NTSB reports (Glenpool, OK; Winchester, KY; Kingman, KS; DuBois, PA). Documentation and open communication is critical to adequate emergency response.

Patterns and trends in causes of pipeline failures (see Restrepo et al. 2009; Simonoff et al. 2011; and U.S. Department of Transportation, "Leak Detection Study" 2012). provide a broader context for potential pipeline vulnerabilities than provided in this research. These references are an important guide for communications among pipeline companies, other companies such as construction contractors and electric utilities (that interact with them), and emergency responders. These references help the stakeholders know what kinds of vulnerabilities to anticipate.

Process versus content in communications

There is an abundance of required and recommended practices that provide guidance about the process of the improving communications during all types of emergencies—including pipelines. Federal and state governments provide frameworks that encourage meetings among persons from various response organizations. While essential, these regulations and recommendations typically have an important shortcoming, they do not provide methods for anticipating and documenting the content of communications during emergencies, nor do many of them provide specific performance metrics.

Process of communication

Public Safety Answering Points (PSAP), or 9-1-1 call centers, are important clearing houses for exchange of information between emergency responders (from the public agencies or pipeline company) and the public, and among emergency responders. Coordination of communication among detection personnel and emergency dispatch units within pipeline companies who act to contain a release is a critical operation, and, according to the NTSB, this requires a clear line of control (San Bruno, CA). Multiple routes of communication are important in the event that any given source becomes inoperative, and in order to simultaneously confirm sources of information.

Operator training is the key element of support for communication. Training programs should include emergency contacts and resources at the federal and local level, equipment use, alarm scenarios, etc. This information needs to be easily accessible in a known location. Developing closer relationships with PSAPs can be a useful measure for improving dissemination of pre-event information between pipeline operators and emergency responders. The role of PSAPs is especially important where numerous small emergency responder organizations are coordinated from a single communications center.

Pipeline Operators: Learning About Emergency Responders in a Service Area

Pipeline systems traverse numerous political subdivisions and entities. An important, if not primary, piece of information for pipeline operators is to know how to contact the 9-1-1 or dispatch facilities serving public emergency responders located along pipeline right-of-way. This requires knowing the 10—digit direct-dial number for each facility. Jurisdiction of law enforcement, emergency medical services, and fire services may not be the same, and some jurisdictions may even overlap. While the trend in many parts of the country is to consolidate emergency communications on a countywide basis, this practice is

far from universal and many variations exist. The National Emergency Number Association (NENA) offers a service to provide such contact information for pipeline operators.

Another key piece of information is to know the capabilities of public emergency responders protecting portions of a pipeline. Establishing personal relationships with representatives of key public safety agencies along the pipeline right-of-way is critical. Depending on the product carried and capacity of the pipeline, specialized response equipment and resources may be necessary to respond in a safe manner. Resource demand for such an incident will commonly require the services of multiple agencies summoned under mutual aid agreements for all but the largest public safety agencies. Tools such as the "Emergency Response Capability Database and Reporting Tool", operated by the Pipeline Association for Public Awareness (http://www.pipelineawareness.org/welcome-government-and-emergency-officials/response-capability-survey-reporting-tool/) is one measure to help provide this information on a voluntary basis.

Public Safety Emergency Responders: Learning About Pipelines in a Service Area

Knowing the locations and products carried in pipelines in their community is the single most important step in preparing for a potential incident. Visual clues such as assessment of pipeline markers can also provide assistance in locating transmission pipelines. However, distribution pipelines may or may not be marked, or are not marked as well as larger transmission lines.

Information on hazardous liquid and gas transmission pipelines active within a community can be obtained from the PHMSA. To find out what hazardous liquid or gas transmission pipelines are running in a particular area, an agency can begin with the PHMSA National Pipeline Mapping System (https://www.npms.phmsa.dot.gov/). Representatives from public safety emergency response organizations can get an account that will permit access to the detailed maps for their respective county or jurisdiction. In addition to this tool, a search for organizations operating pipelines can be done by state, county, or zip code using (https://www.npms.phmsa.dot.gov/FindOperator/PublicSearch.aspx). This system allows public safety emergency responders to identify companies operating in their response area, enabling emergency response agencies to make contact with the pipeline operator and get further information.

The PHMSA mapping system does not include distribution pipelines. Public safety emergency response agencies will need to contact their local gas utility for more information on these pipelines. In addition, gathering pipelines should be identified by networking with oil or gas producers, if such activities are ongoing in their area. Once this initial assessment is made, the pipeline operators should be contacted to verify the routing of pipelines and the products carried.

Human Behavior and Communication Failures

Behavioral factors can influence the flow of information and must be anticipated in the design and implementation of communication systems, especially during the initial assessment, alerting and notification phase. The NTSB identified "confirmation bias" as a factor that inhibited communications between 9-1-1 operators, the public and emergency responders in past incidents (NTSB, "Pipeline Accident Report, Enbridge Incorporated, Marshall, MI," 2012, 103). Confirmation bias occurs when people favor currently held knowledge or beliefs over new facts. Such strongly held beliefs can prevent people from paying attention to or acting on emergency communications. (Nickerson 1998, 175-220).

Combating confirmation bias is especially important where 9-1-1 call-takers and public safety emergency communications dispatchers may be accustomed to receiving calls for minor natural gas leaks or odors, and unintentionally rule out the possibility of a pipeline emergency.

Other behavioral factors include what influences people to trust or defer to certain sources of information over others, as well as how people interpret high risk situations and response scenarios (Slovic 1993, 675-682); (Fischhoff et al, 2000). People will sometimes underestimate or deny the presence of significant hazards and extreme risks (Slovic 2000, 99).

People tend to view emergencies from the perspective of their own roles. This can interfere with the likelihood that they will attend to the information needs of people in other roles who must respond to a pipeline emergency. Research about pipeline emergencies revealed that the two most likely ways in which information is not provided are: (1) The information is not collected in the first place; and (2) the information is sent too late. Both of these failure modes reflect preparedness problems among persons who are the sources of information. Persons who should transmit information may be unaware that it is needed by someone else, or they may simply be so caught up in their immediate responsibilities that the information is not sent early enough in an incident.

Methodological issues in using the three analytical approaches

Regulations and guidelines provide many frameworks intended to facilitate communications during emergencies, including pipeline incidents. Using these frameworks will help to develop an emergency response plan, acquire the necessary resources and equipment, train responders to maximize their skill sets to perform expected tasks, and conduct exercises to test the desired operational capability. Underlying all of these elements is the need for a communications system that integrates the key players who will be involved in a pipeline emergency, including emergency responders, the pipeline operators, and the public safety answering points and communications centers. In themselves, these frameworks, along with the networking and relationships developed during the planning process, will help to develop a level of trust that will be critical during the response phase.

While frameworks that facilitate communications are necessary, they do not, in themselves, always specify the content of messages that need to be relayed during pipeline emergencies. (As discussed in Chapter 1, there are regulatory requirements that require the reporting of pipeline incidents to certain responsible agencies.) The research described in this report investigated some specific analytic methods designed to examine the content of messages—what messages are most important, who sends and receives them, and how they can be relayed in an accurate and timely manner.

Given the risks involved in a pipeline emergency and the relative infrequency with which major incidents occur, a collaborative effort that integrates emergency responders, the pipeline operators, and the public safety answering point(s) PSAPs and communications center is essential for the development and delivery of an effective emergency preparedness capability. A successful incident outcome will not be achieved in the absence of addressing critical information needs and communication processes.

In its role to facilitate the coordination of the planning and response processes, especially where the use of mutual aid resources is anticipated, the local or county emergency management agency can assist in developing the content of emergency communications. The general approach to planning for pipeline emergency communications is drawn from Federal Emergency Management Agency (FEMA) doctrine, and supplemented with information gathering and modeling techniques developed as part of this research.

Situation Awareness Information Requirements analysis

Value of using functional roles instead of organizational affiliations

In applying the situation awareness information requirements analysis, we found that focusing on functional roles instead of organizational affiliations was important. First, members of more than a single organization may be called on to assume the same functional roles, especially early in an incident. For example, depending on who is first on the scene, pipeline operators or public safety responders may need to assess the situation, notify public safety dispatch, and evacuate persons in immediate danger. If these functions are restricted to a particular organization, there can be a significant delay in making decisions that reduce likelihood of casualties and property and environmental damage.

Value of discovering and modeling the information required to make effective and timely decisions

The process of working through information requirements was of value to the participants in the SAIRA workshops. They were fully engaged in the process and seemed to achieve a greater understanding of their own roles as well as the roles of other entities that need to respond during an emergency. Documenting the findings from the workshop is likely to be of particular value. While meetings facilitated by the various federal and local frameworks are important to enhancing communications during all types of emergencies, the results of these meetings are not typically documented in a manner that preserves the acquired insights that can be quickly reviewed with little effort. The SAIRA produces easily comprehended models of functions roles, actionable decisions and information, thus preserving the results for future responders who do not have the advantage of having attended meetings. This is especially important given the relative rarity of severe pipeline emergencies, especially those involving transmission pipelines. Where resources are limited and the probabilities of severe pipeline incidents are very low, new cohorts of responders are unlikely to have an opportunity to meet and train on pipeline scenarios. Having the opportunity to review documented roles, decisions and information requirements has obvious value.

The SAIRA is ideal when used as a preliminary step to conducting a tabletop exercise. Discovering information requirements is an important exercise, but the process is often incomplete and inadequately captured in the lessons learned and after action reports. If the critical information requirements are recognized before the tabletop exercise, participants can more efficiently turn their attention to acquiring information and identifying the recipients.

Information flow analysis

We were unsuccessful in using a survey instrument to acquire a set of information flows that were common across locations. As noted in the findings chapter, we believe that our difficulties resulted from the simple fact that there is no generic set of information flows—that the sources and means to convey information differ widely from one location to the next. Our attempt to test the value of discovering localized information flows received support by our successful attempt to acquire and model data from a single county.

Failure modes and effects analysis

The failure modes and effects analysis would benefit from the reduction of the burdensomeness of the questionnaire method. The findings were not sensitive to the likely consequences of failure modes, presumably because all of the information requirements were considered very important, thus restricting the range of ratings. Therefore, there was little to be achieved by having respondents rate the severity of

consequences, and this part of the questionnaire could probably be eliminated without affecting the validity of the findings. Subsequent use of the FMEA questionnaire could be limited to ratings of the likelihood that the failure modes would occur, based on the extensive research and validation of these highly-detailed analyses undertaken in this project.

Suggested research: localizing the analyses

We had variable success in using the three analytical methods in characterizing generically valid findings that are likely generalized to various geographic settings. The SAIRA successfully yielded a set of functional roles that appear to be universally acceptable. The FMEA yielded a ranking of failure modes that has good face validity, at least until practices and technologies evolve further. However, the information flow analysis seems likely to be inextricably tied to local practices regarding means by which information is conveyed and the likely sources of needed information.

While the set of functional roles and the likelihood of failures modes may generalize across settings, there are other reasons to collect and analyze the information locally.

- Information that is locally collected and analyzed will reflect differences in the use terminology and practices, yielding results that are more easily understood and have greater face validity.
- Information that is locally collected and analyzed will have greater "ownership," that is, findings generated locally are more likely to be more credible and valid, and therefore more likely to influences preparations for pipeline emergencies.

Because the analytic methods employed in this research are likely to be far more effective when conducted locally, we recommend additional research that investigates best practices about how local jurisdictions can conduct these methods to discover and model the functional roles, actionable decisions, required information, information sources and communications means, and probable sources of failure when communicating information.

Research covering best practices for locally-applied analytic methods should include how to collect data and how to model the data. The findings in this research report typically used diagrams to model the findings. However, findings from these studies could have been represented using tables and narratives. While we believe that diagrams are more easily comprehended, this hypothesis has not been empirically tested. Moreover, local jurisdictions may lack the expertise needed to create diagrams. The relative value of different ways to represent findings could be resolved in a small study that observes how quickly subjects can understand research findings when different approaches are used.

The relative merits of using different data collection methods are another important avenue of research. In the research reviewed in this report, facilitated workshops, group interviews and questionnaires were all used. While questionnaires worked reasonably well to collect data in the FMEA study, the same approach was not successful when collecting data about information flow. Research is needed to investigate alternative methods to collect information flow data, such as the use of tabletop exercises as described in the next section.

Advice on conducting localized information flow analyses

There are various approaches available for collecting information flow data. However, regardless of how the data is collected, the process will be more efficient and comprehensive if a SAIRA is already available. With a SAIRA in hand, persons in a particular locale can focus on how they can acquire the needed information, and to whom they need to provide information. While we recommend that local jurisdiction either edit the generic set of information requirements, or conduct their own analysis, a set of information requirements is invaluable as input to a localized information flow analysis.

There are alternative methods that can be used to acquire the data for a localized information flow analysis, including group interviews and tabletop exercises.

Group interviews

The sample information flow diagrams provided in Chapter 3 illustrate the information collected by a facilitator that met with a group of emergency responders. Group meetings are more efficient and effective than individual interviews. Meeting in groups makes it less likely that important information will be omitted and encourages the exchange of ideas and scenarios, allowing members to bounce ideas off each other, which may not be evident to the individual.

Tabletop exercises

A tabletop exercise (in this context, using a pipeline release scenario) is an excellent way to collect information flow data. Material considered in a tabletop exercise will generally concern the flow of information. Representatives from different agencies interact to understand each other's information needs and to identify potential information sources. An observer, or the participants themselves, can retain this data and represent it as an information flow analysis, thus preserving the findings for people who were not present.

Tabletop exercises often involve an informal and disorganized version of the situation awareness information requirements analysis. There is no particular value in spending time during the tabletop exercise to learn information requirements because the associated decisions are internal to an agency or company. Facilitators who run tabletop exercises might consider asking participants to use a tool, like a SAIRA, before attending the exercise. This will allow participants to spend less time during the tabletop exercise understanding their own information requirements, and more time considering the likely sources of the needed information, as well as negotiating how to convey the information quickly and reliably.

Suggested research: analysis of pipeline incidents

The use of National Transportation Safety Board reports on major incidents was a rich source of detailed and highly useful information that was used to understand the consequences and contributing factors for large-loss incidents. Future research could consider other sources of pipeline incidents, especially cases for which there were not major losses – studying "near-misses" as well as successful incidents.

A second finding of this research was that while there are indeed many similarities between transmission and distribution pipeline incidents, there are key differences. Developing common guidance for both types of pipelines, carrying both natural gas and hazardous liquids, on a national scope, was ambitious. Additional research may be profitably focused on a better understanding of the differential

characteristics of transmission and distribution pipelines, in particular, with the possible separate consideration of natural gas distribution systems as separate analytical categories or groups.

As communication technologies and potential for incorporation of analytics into SCADA systems develop, entirely novel means for better detecting and locating pipeline incidents are likely to arise. Integration of these technologies with an explicit eye toward integration with public emergency responders is a critical area for future research.

The authors hope that the diverse interest groups convened for review of products developed under this research can continue to remain engaged on this important issue. We hope that the results of this research will be used to further improve the safety of pipelines and improve the awareness of and preparedness for such incidents.

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FINAL TASK REPORT

HMCRP HM-15 TRANSPORTATION RESEARCH BOARD (NAS)

Appendix 2: Summary of Current Federal, State, and Representative Local and Tribal Regulations and Ordinances Governing Emergency Response Plans For Natural Gas And Hazardous Liquids Pipelines

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Contents

Introduction

This report is a document prepared in support of the research project's objective of preparing a *Guide for Communication of Emergency Response Information for Natural Gas and Liquid Pipelines*. Task-1 of the project requires the research team to summarize current federal and state, and representative local, and tribal regulations and ordinances governing emergency response plans for natural gas and hazardous liquids pipelines.

To accomplish Task-1, the researchers examined eight significant Federal regulations that govern pipeline safety and identified in each the emergency planning requirements. The following regulations were analyzed: CFR (Code of Federal Regulations) 49 Part 192, 49 CFR Part 193, 49 CFR Part 33, 49 CFR Part 194, 49 CFR Part 195, 40 CFR Part 112, 30 CFR Part 254, and 49 CFR Part 194.

Although the nation's onshore pipeline safety programs are overseen by Congress and administered by the U.S. Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), PHMSA delegates the majority of these responsibilities for inspection and enforcement of intrastate pipelines to the States. Because States are allowed to adopt pipeline safety regulations that are stricter than Federal government regulations, the research team conducted a careful analysis of pipeline safety regulations in all fifty states. Additionally, researchers examined tribal regulations governing pipeline emergency response plans.

The researchers also examined and summarized pertinent federal environmental permitting requirements established by the U.S. Army Corps of Engineers, U.S. Fish and Wildlife, Bureau of Land Management, U.S. Forest Service, and other agencies.

This report is organized by research task. Each section states the assigned task, provides an overview of the agency's jurisdiction, summarizes the emergency planning requirements, and where appropriate provides a citation for the source of the information. This report is supported by the following appendices:

Appendix-A: *List of Acronyms* – Terms used in regulations are often referenced using an acronym. The first time the term is used in the report, it is spelled out and followed by its acronym. Appendix-A lists acronyms in the order that they appear in the report and are cross-referenced back to the page number where they first appear in the report.

Appendix-B: *Listing of Significant Pipeline Incidents and Their Impact By State* – This appendix covers incidents that have occurred within the United States from 2001 to 2011. The table alphabetically lists the states with the most significant incidents, number of incidents with fatalities, total number of fatalities, incidents

with injury, total number of injuries, total cost in property damage, and total pipeline mileage.

Appendix-C: *State Pipeline Enforcement Agencies* – This appendix lists the pipeline enforcement agency for 48 states, and their respective points of contact. Excluded are the states of Alaska and Hawaii, which do not have a state pipeline enforcement agency.

Appendix-D: *States with Enhanced Pipeline Regulations* – This appendix indicates the states that have existing intrastate pipeline regulations that contain enhanced requirements for emergency planning or notification that go beyond federal regulations.

Key Findings

☐ Responsibility for pipeline safety and emergency planning oversight is shared by Federal, State and Tribal authorities. Federal pipeline regulations have very specific emergency planning requirements that include, among others, mandated written emergency response procedures and the requirement for communication of emergency plans and procedures to fire, police, and other public officials.

☐ All 50 States and the District of Columbia have elected to adopt by reference, federal pipeline safety regulations. Therefore all federal requirements for emergency planning and information sharing are in effect uniformly throughout the country.

☐ Through cooperative agreements with the United States (U.S.) Department of Transportation, Office of Pipeline Safety (OPM), all 50 States have an assigned pipeline inspection and enforcement entity.

☐ Several states have enhanced requirements for gas pipeline distribution systems that increase public safety levels compared to the adopted Federal Regulations. In particular, enhancements involve additional filing requirements of emergency plans and information with the appropriate state agencies, fire departments having fire suppression responsibility, law enforcement agencies, and in a few cases, schools located close to pipeline rights-ofways.

☐ The research team conducted an analysis of all 50 States to determine the most significant pipeline incidents for the period 2001 to 2011. (See Appendix-B.)

☐ States with the greatest number of pipeline miles are Texas (219,492 miles) California (122,406 miles) and Illinois (77,854 miles.)

☐ The federal government has jurisdiction over pipeline safety on tribal lands for both intrastate and interstate pipelines. As such, whatever emergency planning requirements existing in federal regulations also apply on tribal lands. However, the federal government has no jurisdiction for pipelines that originate and terminate on tribal lands.

☐ The U.S. Department of the Interior Indian Affairs Tribal Directory lists 34 States with Federally recognized Indian Tribes. Alaska has the greatest number of tribes (40%) followed by California (19%) and Oklahoma (7%).

TASK 1.1

SUMMARIZE FEDERAL REGULATION – TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE (49 CFR PART 192)

Scope of Regulation

49 CFR Part 192 outlines the minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities and the transportation of gas both onshore and offshore within the limits of the outer continental shelf.

Under the regulation, gas is defined as natural gas, flammable gas, or gas that is toxic or corrosive. This would include natural gas gathering, transmission, and distribution systems, as well as other flammable petroleum gases, including propane, butane, propylene, and butylene.

Part (a) prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities and the transportation of gas within the limits of the outer continental shelf as that term is defined in the Outer Continental Shelf Lands Act (43 U.S.C. 1331).

Part (b) excludes the following types of facilities:

(1) Offshore gathering of gas in State waters upstream from the outlet flange of each facility where hydrocarbons are produced or where produced hydrocarbons are first separated, dehydrated, or otherwise processed, whichever facility is farther downstream;

(2) Pipelines on the Outer Continental Shelf (OCS) that are producer-operated and cross into State waters without first connecting to a transporting operator's facility on the OCS, upstream (generally seaward) of the last valve on the last production facility on the OCS. Safety equipment protecting PHMSA-regulated pipeline segments is not excluded. Producing operators for those pipeline segments upstream of the last valve of the last production facility on the OCS may petition the Administrator, or designee, for approval to operate under PHMSA regulations governing pipeline design, construction, operation, and maintenance under 49 CFR 190.9;

(3) Pipelines on the Outer Continental Shelf upstream of the point at which operating responsibility transfers from a producing operator to a transporting operator;

(4) Onshore gathering of gas—

(i) Through a pipeline that operates at less than 0 psig (0 kPa);

(ii) Through a pipeline that is not a regulated onshore gathering line (as determined in §192.8); and (iii) Within inlets of the Gulf of Mexico, except for the requirements in §192.612; or

(5) Any pipeline system that transports only petroleum gas or petroleum gas/air mixtures to—

(i) Fewer than 10 customers, if no portion of the system is located in a public place; or

(ii) A single customer, if the system is located entirely on the customer's premises (no matter if a portion of the system is located in a public place).

Emergency Planning Requirements

(a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

(1) Receiving, identifying, and classifying notices of events which require immediate response by the operator.

(2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.

(3) Prompt and effective response to a notice of each type of emergency, including the following:

(i) Gas detected inside or near a building.

(ii) Fire located near or directly involving a pipeline facility.

(iii) Explosion occurring near or directly involving a pipeline facility.

(iv) Natural disaster.

(4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.

(5) Actions directed toward protecting people first and then property.

(6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

(7) Making safe any actual or potential hazard to life or property.

(8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

(9) Safely restoring any service outage.

(10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible.

(11) Actions required to be taken by a controller during an emergency in accordance with §192.631.

(b) Each operator shall:

(1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures.

(2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.

(3) Review employee activities to determine whether the procedures were effectively followed in each emergency.

(c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

(1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;

(2) Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;

(3) Identify the types of gas pipeline emergencies of which the operator notifies the officials; and

(4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

Source: 49 CFR PART 192Amdt. 192–24, 41 FR 13587, Mar. 31, 1976, as amended by Amdt. 192–71, 59 FR 6585, Feb. 11, 1994; Amdt. 192– 112, 74 FR 63327, Dec. 3, 2000.

TASK 1.2 SUMMARIZE FEDERAL REGULATION – LIQUEFIED NATURAL GAS FACILITIES: FEDERAL SAFETY STANDARDS (49 CFR PART 193)

Scope of Regulation

Part 193 outlines safety standards for liquefied natural gas (LNG) facilities used in the transportation of liquefied natural gas by pipeline that is subject to the pipeline safety laws and Part 192 regulations. This regulation covers pipeline facilities used for liquefying natural gas or synthetic gas or transferring, storing, or vaporizing liquefied natural gas.

Part (a) prescribes safety standards for LNG facilities used in the transportation of gas by pipeline that is subject to the pipeline safety laws (49 U.S.C. 60101 *et seq.)* and Part 192 of this chapter.

Part (b) excludes the following types of facilities:

(1) LNG facilities used by ultimate consumers of LNG or natural gas.

(2) LNG facilities used in the course of natural gas treatment or hydrocarbon extraction which do not store LNG.

(3) In the case of a marine cargo transfer system and associated facilities, any matter other than siting pertaining to the system or facilities between the marine vessel and the last manifold (or in the absence of a manifold, the last valve) located immediately before a storage tank.

(4) Any LNG facility located in navigable waters (as defined in Section 3(8) of the Federal Power Act (16 U.S.C. 796(8)).

Emergency Planning Requirements

§ 193.2509 Emergency Procedures

(a) Each operator shall determine the types and places of emergencies other than fires that may reasonably be expected to occur at an LNG plant due to operating malfunctions, structural collapse, personnel error, forces of nature, and activities adjacent to the plant.

(b) To adequately handle each type of emergency identified under paragraph (a) of this section and each fire emergency, each operator must follow one or more manuals of written procedures. The procedures must provide for the following:

(1) Responding to controllable emergencies, including notifying personnel and using equipment appropriate for handling the emergency.
(2) Recognizing an uncontrollable emergency and taking action to minimize harm to the public and personnel, including prompt notification of appropriate local officials of the emergency and possible need for evacuation of the public in the vicinity of the LNG plant.

(3) Coordinating with appropriate local officials in preparation of an emergency evacuation plan, which sets forth the steps required to protect the public in the event of an emergency, including catastrophic failure of an LNG storage tank.
(4) Cooperating with appropriate local officials in evacuations and emergencies requiring mutual assistance and keeping these officials advised of:
(i) The LNG plant fire control equipment, its location, and quantity of units located throughout the plant;(ii) Potential hazards at the plant, including fires;
(iii) Communication and emergency control capabilities at the LNG plant; and (iv) The status of each emergency.

§ 193.2903 Security Procedures

Each operator shall prepare and follow one or more manuals of written procedures to provide security for each LNG plant.

The procedures must be available at the plant in accordance with §193.2017 and include at least:
(a) A description and schedule of security inspections and patrols performed in accordance with §193.2913;
(b) A list of security personnel positions or responsibilities utilized at the LNG plant;
(c) A brief description of the duties associated with each security personnel position or responsibility;
(d) Instructions for actions to be taken, including notification of other appropriate plant personnel and law enforcement officials, when there is any indication of an actual or attempted breach of security;

(e) Methods for determining which persons are allowed access to the LNG plant;
(f) Positive identification of all persons entering the plant and on the plant, including methods at least as effective as picture badges; and
(g) Liaison with local law enforcement officials to keep them informed about current security procedures under this section.

Source: 49 CFR Part 193, Amdt. 193–2, 45 FR 70405, Oct. 23, 1980, as amended by Amdt. 193–18, 69 FR 11337, Mar. 10, 2004.

TASK 1.2.A SUMMARIZE U.S. COAST GUARD REGULATION ON WATERFRONT FACILITIES HANDLING LIQUEFIED NATURAL GAS AND LIQUEFIED HAZARDOUS GAS (49 CFR PART 33)

Scope of Regulation

Subparts A and B of the regulation apply to the marine transfer area for LNG of each new waterfront facility handling LNG and to new construction in the marine transfer area for LNG of each existing waterfront facility handling LNG.

(b) Subpart A of this part and §§127.301 through 127.617 apply to the marine transfer area for LNG of each active existing waterfront facility handling LNG.

(c) Sections 127.007 (b), (c), and (d); 127.019(b); and 127.701 of subparts A and B of this part apply to the marine transfer area for LNG of each inactive existing facility.

(d) Subparts A and C of this part apply to the marine transfer area for LHG of each active waterfront facility handling liquefied hazardous gas (LHG).

(e) Sections 127.007 (b), (c), and (d); 127.019(b); and 127.1325(c) of subparts A and C of this part apply to the marine transfer area for LHG of each inactive facility.

Emergency Planning Requirements

§ 127.019 Operations Manual and Emergency Manual: Procedures for Examination.

(a) The owner or operator of an active existing facility shall submit two copies of the *Operations Manual* and of the *Emergency Manual* to the Captain of the Port of the zone in which the facility is located.

(b) At least 30 days before transferring LHG or LNG, the owner or operator of a new or an inactive existing facility shall submit two copies of the *Operations Manual* and of the *Emergency Manual* to the Captain of the Port (COTP) of the zone in which the facility is located, unless the manuals have been examined and there have been no changes since that examination.

(c) If the COTP finds that the *Operations Manual* meets §127.305 or §127.1305 and that the Emergency Manual meets §127.307 or §127.1307, the Captain of the Port returns a copy to the owner or operator marked “Examined by the Coast Guard”.

(d) If the COTP finds that the *Operations Manual* or the *Emergency Manual* does not meet this part, the Captain of the Port returns the manual with an explanation of why it does not meet this part.

§ 127.307 Emergency Manual

Each *Emergency Manual* must contain—

(a) LNG release response procedures, including contacting local response organizations;
(b) Emergency shutdown procedures;
(c) A description of the fire equipment and systems and their operating procedures;
(d) A description of the emergency lighting and emergency power systems;
(e) The telephone numbers of local Coast Guard units, hospitals, fire departments, police departments, and other emergency response organizations;
(f) If the waterfront facility handling LNG has personnel shelters, the location of and provisions in each shelter;
(g) First aid procedures and if there are first aid stations, the locations of each station; and
(h) Emergency procedures for mooring and unmooring a vessel.

§ 127.309 Operations Manual and Emergency Manual: Use

The operator shall ensure that—

(a) LNG transfer operations are not conducted unless the waterfront facility handling LNG has an examined *Operations Manual* and examined *Emergency Manual;* (b) Each transfer operation is conducted in accordance with the examined *Operations Manual;* and (c) Each emergency response is in accordance with the examined *Emergency Manual.*

§ 127.321 Release of LNG.

(a) The operator of the waterfront facility handling LNG shall ensure that—

(1) No person releases LNG into the navigable waters of the United States; and
(2) If there is a release of LNG, vessels near the facility are notified of the release by the activation of the warning alarm. (b) If there is a release of LNG, the person in charge of shoreside transfer operations shall—
(1) Immediately notify the person in charge of cargo transfer on the vessel of the intent to shutdown;
(2) Shutdown transfer operations;
(3) Notify the COTP of the release; and
(4) Not resume transfer operations until authorized by the COTP.

§ 127.711 Communications Security

The marine transfer area for LNG must have a means of direct communications between the security patrol and other operating or security personnel on duty on the waterfront facility handling LNG.

§ 127.1307 Emergency Manual

(a) Each Emergency Manual must contain—

(1) For each LHG handled—

(i) A physical description of the LHG; (ii) A description of the hazards of the LHG; (iii) First-aid procedures for persons exposed to the LHG or its vapors; (iv) The procedures for response to a release of the LHG; and, (v) If the LHG is flammable, the procedures for fighting a fire involving the LHG or its vapors;

(2) A description of the emergency shutdown required by §127.1205;

(3) The procedures for emergency shutdown;

(4) A description of the number, kind, place, and use of the fire equipment required by §127.1501(a) and of the portable fire extinguishers required by §127.1503;

(5) The telephone numbers of local Coast Guard units, hospitals, fire departments, police departments, and other emergency-response organizations;
(6) If the facility has personnel shelters, the place of and provisions in each shelter;

(7) If the facility has first-aid stations, the location of each station;

(8) Emergency procedures for mooring and unmooring a vessel; and,

(9) If an off-site organization is to furnish emergency response, a copy of the written agreement required by §127.1505(a)(2).

(b) The employee-emergency plan and fire-prevention plan required by OSHA in 29 CFR 1910.38 may be used to comply with this section to the extent that they address the requirements specified in paragraphs (a) (1) through (9) of this section.

§ 127.1309 Operations Manual and Emergency Manual: Use

Each operator of a waterfront facility handling LHG shall ensure that—

(a) No transfer is conducted unless the facility has an examined Operations Manual and an examined Emergency Manual;

(b) Each transfer is conducted in accordance with the examined Operations Manual; and

(c) Each emergency response is conducted in accordance with the examined Emergency Manual.

Sources:

1. 49 CFR Part 33, CGD 88–049, 60 FR 39794, Aug. 3, 1995, as amended by USCG–2007–27022, 75 FR 29426, May 26, 2010.

2. 49 CFR Part 33, CGD 78–038, 53 FR 3376, Feb. 7, 1988, as amended by CGD 88–049, 60 FR 39795, Aug. 3, 1995.

3. 49 CFR Part 33, CGD 88–049, 60 FR 39799, Aug. 3, 1995; 60 FR 49509, Sept. 26, 1995.

TASK 1.3 SUMMARIZE FEDERAL REGULATION – RESPONSE PLAN FOR ONSHORE OIL PIPELINES (49 CFR PART 194)

Scope of Regulation

Part 194.3 applies to an operator of an onshore oil pipeline that, because of its location, could reasonably be expected to cause substantial harm, or significant and substantial harm to the environment by discharging oil into or on any navigable waters of the United States or adjoining shorelines.

Emergency Planning Requirements

§ 194.107 General Response Plan Requirements

(a) Each response plan must include procedures and a list of resources for responding, to the maximum extent practicable, to a worst case discharge and to a substantial threat of such a discharge. The “substantial threat” term is equivalent to abnormal operations outlined in 49 CFR 195.402(d). To comply with this requirement, an operator can incorporate by reference into the response plan the appropriate procedures from its manual for operations, maintenance, and emergencies, which is prepared in compliance with 49 CFR 195.402.

(b) An operator must certify in the response plan that it reviewed the National Contingency Plan (NCP) and each applicable Area Contingency Plan (ACP) and that its response plan is consistent with the NCP and each applicable ACP as follows:

(1) As a minimum to be consistent with the NCP a facility response plan must:

(i) Demonstrate an operator's clear understanding of the function of the Federal response structure, including procedures to notify the National Response Center reflecting the relationship between the operator's response organization's role and the Federal On Scene Coordinator's role in pollution response;

(ii) Establish provisions to ensure the protection of safety at the response site; and

(iii) Identify the procedures to obtain any required Federal and State permissions for using alternative response strategies such as in-situ burning and dispersants as provided for in the applicable ACPs; and

(2) As a minimum, to be consistent with the applicable ACP the plan must:

(i) Address the removal of a worst case discharge and the mitigation or prevention of a substantial threat of a worst case discharge;

(ii) Identify environmentally and economically sensitive areas;

(iii) Describe the responsibilities of the operator and of Federal, State and local agencies in removing a discharge and in mitigating or preventing a substantial threat of a discharge; and

(iv) Establish the procedures for obtaining an expedited decision on use of dispersants or other chemicals.

(c) Each response plan must include:

(1) A core plan consisting of—

(i) An information summary as required in §194.113,

(ii) Immediate notification procedures,

(iii) Spill detection and mitigation procedures,

(iv) The name, address, and telephone number of the oil spill response organization, if appropriate,

(v) Response activities and response resources,

(vi) Names and telephone numbers of Federal, State and local agencies which the operator expects to have pollution control responsibilities or support,

(vii) Training procedures,

(viii) Equipment testing,

(ix) Drill program—an operator will satisfy the requirement for a drill program by following the National Preparedness for Response Exercise Program (PREP) guidelines. An operator choosing not to follow PREP guidelines must have a drill program that is equivalent to PREP. The operator must describe the drill program in the response plan and Office of Pipeline Safety (OPS) will determine if the program is equivalent to PREP.

(x) Plan review and update procedures;

(2) An appendix for each response zone that includes the information required in paragraph (c)(1)(i)–(ix) of this section and the worst case discharge calculations that are specific to that response zone. An operator submitting a response plan for a single response zone does not need to have a core plan and a response zone appendix. The operator of a single response zone onshore pipeline shall have a single summary in the plan that contains the required information in §194.113.7; and

(3) A description of the operator's response management system including the functional areas of finance, logistics, operations, planning, and command. The plan must demonstrate that the operator's response management system uses common terminology and has a manageable span of control, a clearly defined chain of command, and sufficient trained personnel to fill each position.

Source: 49 CFR, Part 194, Amdt. 194–4, 70 FR 8747, Feb. 23, 2005.

TASK 1.4 SUMMARIZE FEDERAL REGULATION – TRANSPORTATION OF HAZARDOUS LIQUIDS BY PIPELINE (49 CFR PART 195)

Scope of Regulation

Part 195 outlines safety standards and reporting requirements for pipeline facilities used in the transportation of hazardous liquids and carbon dioxide affecting interstate or foreign commerce. Under the regulation, hazardous liquids are defined as petroleum, petroleum products, or anhydrous ammonia.

§ 195.0 Scope

Part 195 prescribes safety standards and reporting requirements for pipeline facilities used in the transportation of hazardous liquids or carbon dioxide.

Under § 195.1 applies to pipeline facilities and the transportation of hazardous liquids or carbon dioxide associated with those facilities in or affecting interstate or foreign commerce, including pipeline facilities on the Outer Continental Shelf (OCS). These may include:

(1) Any pipeline that transports a highly volatile liquid;

(2) Any pipeline segment that crosses a waterway currently used for commercial navigation;

(3) Except for a gathering line not covered by paragraph (a)(4) of this Section, any pipeline located in a rural or non-rural area of any diameter regardless of operating pressure;

(4) Any of the following onshore gathering lines used for transportation of petroleum:

(i) A pipeline located in a non-rural area;

(ii) A regulated rural gathering line as provided in §195.11; or

(iii) A pipeline located in an inlet of the Gulf of Mexico as provided in §195.413.

Under Part-b, the following types of facilities are excepted:

(1) Transportation of a hazardous liquid transported in a gaseous state;

(2) Transportation of a hazardous liquid through a pipeline by gravity;

(3) Transportation of a hazardous liquid through any of the following low-stress pipelines:

(i) A pipeline subject to safety regulations of the U.S. Coast Guard; or

(ii) A pipeline that serves refining, manufacturing, or truck, rail, or vessel terminal facilities, if the pipeline is less than one mile long (measured outside facility grounds) and does not cross an offshore area or a waterway currently used for commercial navigation;

(4) Transportation of petroleum through an onshore rural gathering line that does not meet the definition of a “regulated rural gathering line” as provided in §195.11. This exception does not apply to gathering lines in the inlets of the Gulf of Mexico subject to §195.413;

(5) Transportation of hazardous liquid or carbon dioxide in an offshore pipeline in state waters where the pipeline is located upstream from the outlet flange of the following farthest downstream facility: The facility where hydrocarbons or carbon dioxide are produced or the facility where produced hydrocarbons or carbon dioxide are first separated, dehydrated, or otherwise processed;

(6) Transportation of hazardous liquid or carbon dioxide in a pipeline on the OCS where the pipeline is located upstream of the point at which operating responsibility transfers from a producing operator to a transporting operator;

(7) A pipeline segment upstream (generally seaward) of the last valve on the last production facility on the OCS where a pipeline on the OCS is producer-operated and crosses into state waters without first connecting to a transporting operator's facility on the OCS. Safety equipment protecting PHMSA-regulated pipeline segments is not excluded. A producing operator of a segment falling within this exception may petition the Administrator, under §190.9 of this chapter, for approval to operate under PHMSA regulations governing pipeline design, construction, operation, and maintenance;

(8) Transportation of hazardous liquid or carbon dioxide through onshore production (including flow lines), refining, or manufacturing facilities or storage or in-plant piping systems associated with such facilities;

(9) Transportation of hazardous liquid or carbon dioxide:

(i) By vessel, aircraft, tank truck, tank car, or other non-pipeline mode of transportation; or

(ii) Through facilities located on the grounds of a materials transportation terminal if the facilities are used exclusively to transfer hazardous liquid or carbon dioxide between non-pipeline modes of transportation or between a non-pipeline mode and a pipeline. These facilities do not include any device and associated piping that are necessary to control pressure in the pipeline under §195.406(b); or

(10) Transportation of carbon dioxide downstream from the applicable following point:

(i) The inlet of a compressor used in the injection of carbon dioxide for oil recovery operations, or the point where recycled carbon dioxide enters the injection system, whichever is farther upstream; or

(ii) The connection of the first branch pipeline in the production field where the pipeline transports carbon dioxide to an injection well or to a header or manifold from which a pipeline branches to an injection well.

(b) Breakout tanks. Breakout tanks subject to this Part must comply with requirements that apply specifically to breakout tanks and, to the extent applicable, with requirements that apply to pipeline systems and pipeline facilities. If a conflict exists between a requirement that applies specifically to breakout tanks and a requirement that applies to pipeline systems or pipeline facilities, the requirement that applies specifically to breakout tanks prevails. Anhydrous ammonia breakout tanks need not comply with §§195.132(b), 195.205(b), 195.242(c) and (d), 195.264(b) and (e), 195.307, 195.428(c) and (d), and 195.432(b) and (c).

Emergency Planning Requirements

§ 195.402 Procedural Manual for Operations, Maintenance, and Emergencies

(a) General. Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. This manual shall be reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline system commence, and appropriate parts shall be kept at locations where operations and maintenance activities are conducted.

(b) The Administrator or the State Agency that has submitted a current certification under the pipeline safety laws (49 U.S.C. 60101 et seq.) with respect to the pipeline facility governed by an operator's plans and procedures may, after notice and opportunity for hearing as provided in 49 CFR 190.237 or the relevant State procedures, require the operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

(c) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:

(1) Making construction records, maps, and operating history available as necessary for safe operation and maintenance.

(2) Gathering of data needed for reporting accidents under subpart B of this part in a timely and effective manner.

(3) Operating, maintaining, and repairing the pipeline system in accordance with each of the requirements of this subpart and subpart H of this part.

(4) Determining which pipeline facilities are located in areas that would require an immediate response by the operator to prevent hazards to the public if the facilities failed or malfunctioned.

(5) Analyzing pipeline accidents to determine their causes.

(6) Minimizing the potential for hazards identified under paragraph (c)(4) of this section and the possibility of recurrence of accidents analyzed under paragraph (c)(5) of this section.

(7) Starting up and shutting down any part of the pipeline system in a manner designed to assure operation within the limits prescribed by §195.406, consider the hazardous liquid or carbon dioxide in transportation, variations in altitude along the pipeline, and pressure monitoring and control devices.

(8) In the case of a pipeline that is not equipped to fail safe, monitoring from an attended location pipeline pressure during startup until steady state pressure and flow conditions are reached and during shut-in to assure operation within limits prescribed by §195.406.

(9) In the case of facilities not equipped to fail safe that are identified under paragraph 195.402(c)(4) or that control receipt and delivery of the hazardous liquid or carbon dioxide, detecting abnormal operating conditions by monitoring pressure, temperature, flow or other appropriate operational data and transmitting this data to an attended location.

(10) Abandoning pipeline facilities, including safe disconnection from an operating pipeline system, purging of combustibles, and sealing abandoned facilities left in place to minimize safety and environmental hazards. For each abandoned offshore pipeline facility or each abandoned onshore pipeline facility that crosses over, under or through commercially navigable waterways the last operator of that facility must file a report upon abandonment of that facility in accordance with §195.59 of this part.

(11) Minimizing the likelihood of accidental ignition of vapors in areas near facilities identified under paragraph (c)(4) of this section where the potential exists for the presence of flammable liquids or gases.

(12) Establishing and maintaining liaison with fire, police, and other appropriate public officials to learn the responsibility and resources of each government organization that may respond to a hazardous liquid or carbon dioxide pipeline emergency and acquaint the officials with the operator's ability in responding to a hazardous liquid or carbon dioxide pipeline emergency and means of communication.

(13) Periodically reviewing the work done by operator personnel to determine the effectiveness of the procedures used in normal operation and maintenance and taking corrective action where deficiencies are found.

(14) Taking adequate precautions in excavated trenches to protect personnel from the hazards of unsafe accumulations of vapor or gas, and making available when needed at the excavation, emergency rescue equipment, including a breathing apparatus and, a rescue harness and line.

(15) Implementing the applicable control room management procedures required by §195.446.

(d) Abnormal operation. The manual required by paragraph (a) of this section must include procedures for the following to provide safety when operating design limits have been exceeded:

(1) Responding to, investigating, and correcting the cause of:

(i) Unintended closure of valves or shutdowns;

(ii) Increase or decrease in pressure or flow rate outside normal operating limits;

(iii) Loss of communications;

(iv) Operation of any safety device;

(v) Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property.

(2) Checking variations from normal operation after abnormal operation has ended at sufficient critical locations in the system to determine continued integrity and safe operation.

(3) Correcting variations from normal operation of pressure and flow equipment and controls.

(4) Notifying responsible operator personnel when notice of an abnormal operation is received.

(5) Periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.

(e) Emergencies. The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs:

(1) Receiving, identifying, and classifying notices of events which need immediate response by the operator or notice to fire, police, or other appropriate public officials and communicating this information to appropriate operator personnel for corrective action.

(2) Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental

release of hazardous liquid or carbon dioxide from a pipeline facility, operational failure causing a hazardous condition, and natural disaster affecting pipeline facilities.

(3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.

(4) Taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume of hazardous liquid or carbon dioxide that is released from any section of a pipeline system in the event of a failure.

(5) Control of released hazardous liquid or carbon dioxide at an accident scene to minimize the hazards, including possible intentional ignition in the cases of flammable highly volatile liquid.

(6) Minimization of public exposure to injury and probability of accidental ignition by assisting with evacuation of residents and assisting with halting traffic on roads and railroads in the affected area, or taking other appropriate action.

(7) Notifying fire, police, and other appropriate public officials of hazardous liquid or carbon dioxide pipeline emergencies and coordinating with them preplanned and actual responses during an emergency, including additional precautions necessary for an emergency involving a pipeline system transporting a highly volatile liquid.

(8) In the case of failure of a pipeline system transporting a highly volatile liquid, use of appropriate instruments to assess the extent and coverage of the vapor cloud and determine the hazardous areas.

(9) Providing for a post accident review of employee activities to determine whether the procedures were effective in each emergency and taking corrective action where deficiencies are found.

(10) Actions required to be taken by a controller during an emergency, in accordance with §195.446.

(f) Safety-related condition reports. The manual required by paragraph (a) of this section must include instructions enabling personnel who perform operation and maintenance activities to recognize conditions that potentially may be safety-related conditions that are subject to the reporting requirements of §195.55.

Sources:

1. Amdt. 195–22, 46 FR 38360, July 27, 1981
2. 47 FR 32721, July 29, 1982, as amended by Amdt. 195–24, 47 FR 46852, Oct. 21, 1982

3. Amdt. 195–39, 53 FR 24951, July 1, 1988
4. Amdt. 195–45, 56 FR 26926, June 12, 1991
5. Amdt. 195–46, 56 FR 31090, July 9, 1991
6. Amdt. 195–49, 59 FR 6585, Feb. 11, 1994
7. Amdt. 195–55, 61 FR 18518, Apr. 26, 1996
8. Amdt. 195–69, 65 FR 54444, Sept. 8, 2000
9. Amdt. 195–173, 66 FR 67004, Dec. 27, 2001
10. Amdt. 195–93, 74 FR 63329, Dec. 3, 2009

TASK 1.5 SUMMARIZE FEDERAL REGULATION – WITH APPLICATION TO OIL SPILL RESPONSE PLANNING FOR PIPELINES (40 CFR PART 112, 30 CFR PART 254, AND 49 CFR PART 194)

Pipeline operations involve both onshore and offshore areas, as well as coastal and inland locations. As a result, different federal agencies have jurisdiction for emergency planning regulations and requirements for dealing with oil spills generated from pipeline accidents. Oil spill response regulations are found in three different federal regulations. The respective agencies include:

☐ **Environmental Protection Agency (EPA) 40 CFR Part 112.** The EPA is responsible for non-transportation-related facilities located landward of the coastline, *e.g.*, inland lakes and rivers, including certain piping and coastal areas landward of the low-water mark.

☐ **Department of Interior, Minerals Management Service (MMS) 30 CFR Part 254.** The MMS regulates offshore non-transportation-related facilities located seaward of the coastline, including certain pipelines.

☐ **Department of Homeland Security, United States Coast Guard (USCG) 33 CFR Part 154, Subpart-F.** The U.S. Coast Guard is responsible for regulating deepwater ports and transportation-related facilities located landward of the coastline

☐ **Department of Transportation – Office of Pipeline Safety (OPS) 49 CFR Part 194.** The OPS has overall regulatory responsibility for all hazardous liquid and gas pipelines in the U.S. including interstate and intrastate.

With the exception of 49 CFR Part 194, which has already been described as Task 1.3, the individual agency regulations are described below.

Environmental Protection Agency [40 CFR Part 112]

§ 112.1 (a)(1) establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone,

or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson Fishery Conservation and Management Act).

Source: 67 FR 47140, July 17, 2002, as amended at 71 FR 77290, Dec. 26, 2006; 73 FR 74300, Dec. 5, 2008; 74 FR 58809, Nov. 13, 2009; 76 FR 21660, Apr. 18, 2011.

Emergency Planning Requirements

Under § 112.20 (a) the Environmental Protection Agency requires the owner or operator of any non-transportation-related onshore facility to prepare a spill response plan that, because of its location, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.

The spill response plan must meet the following provisions:

§ 112.20 (g)(1) All facility response plans shall be consistent with the requirements of the National Oil and Hazardous Substance Pollution Contingency Plan (40 CFR part 300) and applicable Area Contingency Plans prepared pursuant to section 311(j)(4) of the Clean Water Act. The facility response plan should be coordinated with the local emergency response plan developed by the local emergency planning committee under section 303 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 11001 et seq.). Upon request, the owner or operator should provide a copy of the facility response plan to the local emergency planning committee or State emergency response commission.

(2) The owner or operator shall review relevant portions of the National Oil and Hazardous Substances Pollution Contingency Plan and applicable Area Contingency Plan annually and, if necessary, revise the facility response plan to ensure consistency with these plans.

(3) The owner or operator shall review and update the facility response plan periodically to reflect changes at the facility.

(h) A response plan shall follow the format of the model facility-specific response plan included in appendix F to this part, unless you have prepared an equivalent response plan acceptable to the Regional Administrator to meet State or other Federal requirements. A response plan that does not follow the specified format in appendix F to this part shall have an emergency response action plan as specified in paragraphs (h)(1) of this section and be supplemented with a cross-reference section to identify the location of the elements listed in paragraphs (h)(2) through (h)(10) of this section. To meet the requirements of this part, a response plan shall address the following elements, as further described in appendix F to this part:

(1) Emergency response action plan. The response plan shall include an emergency response action plan in the format specified in paragraphs (h)(1)(i) through (viii) of this section that is maintained in the front of the response plan, or as a separate document accompanying the response plan, and that includes the following information:

(i) The identity and telephone number of a qualified individual having full authority, including contracting authority, to implement removal actions;

(ii) The identity of individuals or organizations to be contacted in the event of a discharge so that immediate communications between the qualified individual identified in paragraph (h)(1) of this section and the appropriate Federal officials and the persons providing response personnel and equipment can be ensured;

(iii) A description of information to pass to response personnel in the event of a reportable discharge;

(iv) A description of the facility's response equipment and its location;

(v) A description of response personnel capabilities, including the duties of persons at the facility during a response action and their response times and qualifications;

(vi) Plans for evacuation of the facility and a reference to community evacuation plans, as appropriate;

(vii) A description of immediate measures to secure the source of the discharge, and to provide adequate containment and drainage of discharged oil; and

(viii) A diagram of the facility.

(2) Facility information. The response plan shall identify and discuss the location and type of the facility, the identity and tenure of the present owner and operator, and the identity of the qualified individual identified in paragraph (h)(1) of this section.

(3) Information about emergency response. The response plan shall include:

(i) The identity of private personnel and equipment necessary to remove to the maximum extent practicable a worst case discharge and other discharges of oil described in paragraph (h)(5) of this section, and to mitigate or prevent a substantial threat of a worst case discharge (To identify response resources to meet the facility response plan requirements of this section, owners or operators shall follow appendix E to this part or, where not appropriate, shall clearly demonstrate in the response plan why use of appendix E of this part is not appropriate at the facility and make comparable arrangements for response resources);

(ii) Evidence of contracts or other approved means for ensuring the availability of such personnel and equipment;

(iii) The identity and the telephone number of individuals or organizations to be contacted in the event of a discharge so that immediate communications between the qualified individual identified in paragraph (h)(1) of this section and the appropriate Federal official and the persons providing response personnel and equipment can be ensured;

(iv) A description of information to pass to response personnel in the event of a reportable discharge;

(v) A description of response personnel capabilities, including the duties of persons at the facility during a response action and their response times and qualifications;

(vi) A description of the facility's response equipment, the location of the equipment, and equipment testing;

(vii) Plans for evacuation of the facility and a reference to community evacuation plans, as appropriate;

(viii) A diagram of evacuation routes; and

(ix) A description of the duties of the qualified individual identified in paragraph (h)(1) of this section, that include:

(A) Activate internal alarms and hazard communication systems to notify all facility personnel;

(B) Notify all response personnel, as needed;

(C) Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification;

(D) Notify and provide necessary information to the appropriate Federal, State, and local authorities with designated response roles, including the National Response Center, State Emergency Response Commission, and Local Emergency Planning Committee;

(E) Assess the interaction of the discharged substance with water and/or other substances stored at the facility and notify response personnel at the scene of that assessment;

(F) Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion);

(G) Assess and implement prompt removal actions to contain and remove the substance released;

(H) Coordinate rescue and response actions as previously arranged with all response personnel;

(I) Use authority to immediately access company funding to initiate cleanup activities; and

(J) Direct cleanup activities until properly relieved of this responsibility.

(4) Hazard evaluation. The response plan shall discuss the facility's known or reasonably identifiable history of discharges reportable under 40 CFR part 110 for the entire life of the facility and shall identify areas within the facility where discharges could occur and what the potential effects of the discharges would be on the affected environment. To assess the range of areas potentially affected, owners or operators shall, where appropriate, consider the distance calculated in paragraph (f)(1)(ii) of this section to determine whether a facility could, because of its location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.

(5) Response planning levels. The response plan shall include discussion of specific planning scenarios for:

(i) A worst case discharge, as calculated using the appropriate worksheet in appendix D to this part. In cases where the Regional Administrator determines that the worst case discharge volume calculated by the facility is not appropriate, the Regional Administrator may specify the worst case discharge amount to be used for response planning at the facility. For complexes, the worst case planning quantity shall be the larger of the amounts calculated for each component of the facility;

(ii) A discharge of 2,100 gallons or less, provided that this amount is less than the worst case discharge amount. For complexes, this planning quantity shall be the larger of the amounts calculated for each component of the facility; and

(iii) A discharge greater than 2,100 gallons and less than or equal to 36,000 gallons or 10 percent of the capacity of the largest tank at the facility, whichever is less, provided that this amount is less than the worst case discharge amount. For complexes, this planning quantity shall be the larger of the amounts calculated for each component of the facility.

(6) Discharge detection systems. The response plan shall describe the procedures and equipment used to detect discharges.

(7) Plan implementation. The response plan shall describe:

(i) Response actions to be carried out by facility personnel or contracted personnel under the response plan to ensure the safety of the facility and to mitigate or prevent discharges described in paragraph (h)(5) of this section or the substantial threat of such discharges;

(ii) A description of the equipment to be used for each scenario;

(iii) Plans to dispose of contaminated cleanup materials; and

(iv) Measures to provide adequate containment and drainage of discharged oil.

(8) Self-inspection, drills/exercises, and response training. The response plan shall include:

(i) A checklist and record of inspections for tanks, secondary containment, and response equipment;

(ii) A description of the drill/exercise program to be carried out under the response plan as described in §112.21;

(iii) A description of the training program to be carried out under the response plan as described in §112.21; and

(iv) Logs of discharge prevention meetings, training sessions, and drills/exercises. These logs may be maintained as an annex to the response plan.

(9) Diagrams. The response plan shall include site plan and drainage plan diagrams.

(10) Security systems. The response plan shall include a description of facility security systems.

(11) Response plan cover sheet. The response plan shall include a completed response plan cover sheet provided in section 2.0 of appendix F to this part.

(i)(1) In the event the owner or operator of a facility does not agree with the Regional Administrator's determination that the facility could, because of its location, reasonably be expected to cause substantial harm or significant and substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines, or that amendments to the facility response plan are necessary prior to approval, such as changes to the worst case discharge planning volume, the owner or operator may submit a request for reconsideration to the Regional Administrator and provide additional information and data in writing to support the request. The request and accompanying information must be submitted to the Regional Administrator within 60 days of receipt of notice of the Regional Administrator's original decision. The Regional Administrator shall consider the request and render a decision as rapidly as practicable.

(2) In the event the owner or operator of a facility believes a change in the facility's classification status is warranted because of an unplanned event or change in the facility's characteristics (i.e., substantial harm or significant and

substantial harm), the owner or operator may submit a request for reconsideration to the Regional Administrator and provide additional information and data in writing to support the request. The Regional Administrator shall consider the request and render a decision as rapidly as practicable.

(3) After a request for reconsideration under paragraph (i)(1) or (i)(2) of this section has been denied by the Regional Administrator, an owner or operator may appeal a determination made by the Regional Administrator. The appeal shall be made to the EPA Administrator and shall be made in writing within 60 days of receipt of the decision from the Regional Administrator that the request for reconsideration was denied. A complete copy of the appeal must be sent to the Regional Administrator at the time the appeal is made. The appeal shall contain a clear and concise statement of the issues and points of fact in the case. It also may contain additional information from the owner or operator, or from any other person. The EPA Administrator may request additional information from the owner or operator, or from any other person. The EPA Administrator shall render a decision as rapidly as practicable and shall notify the owner or operator of the decision.

Source: 59 FR 34098, July 1, 1994, as amended at 65 FR 40798, June 30, 2000; 66 FR 34560, June 29, 2001; 67 FR 47151, July 17, 2002.

Department of Interior, Minerals Management Service [30 CFR Part 254]

Emergency Planning Requirements

Under § 254.1 (a), the Minerals Management Service requires a spill response plan if the owner or operator of an oil handling, storage, or transportation facility is located seaward of the coast line.

The spill-response plan must demonstrate that the owner/operator can respond quickly and effectively whenever oil is discharged from the facility. (See §254.6 for the definitions of oil, facility, and “coast line).

Under § 254.23 the Minerals Management Service requires an “Emergency Response Action Plan” as the core of the spill response plan. Information must be organized into easy-to-use formats such as flow charts or tables where appropriate. This section must include:

(a) Designation, by name or position, of a trained qualified individual (QI) who has full authority to implement removal actions and ensure immediate notification of appropriate Federal officials and response personnel.

(b) Designation, by name or position, of a trained spill management team available on a 24-hour basis. The team must include a trained spill-response

coordinator and alternate(s) who have the responsibility and authority to direct and coordinate response operations on your behalf. You must describe the team's organizational structure as well as the responsibilities and authorities of each position on the spill management team.

(c) Description of a spill-response operating team. Team members must be trained and available on a 24-hour basis to deploy and operate spill-response equipment. They must be able to respond within a reasonable minimum specified time. You must include the number and types of personnel available from each identified labor source.

(d) A planned location for a spill-response operations center and provisions for primary and alternate communications systems available for use in coordinating and directing spill-response operations. You must provide telephone numbers for the response operations center. You also must provide any facsimile numbers and primary and secondary radio frequencies that will be used.
(e) A listing of the types and characteristics of the oil handled, stored, or transported at the facility.

(f) Procedures for the early detection of a spill.

(g) Identification of procedures you will follow in the event of a spill or a substantial threat of a spill. The procedures should show appropriate response levels for differing spill sizes including those resulting from a fire or explosion. These will include, as appropriate:

(1) Your procedures for spill notification. The plan must provide for the use of the oil spill reporting forms included in the Area Contingency Plan or an equivalent reporting form.

(i) Your procedures must include a current list which identifies the following by name or position, corporate address, and telephone number (including facsimile number if applicable):

(A) The qualified individual;

(B) The spill-response coordinator and alternate(s); and

(C) Other spill-response management team members.

(ii) You must also provide names, telephone numbers, and addresses for the following:

(A) Oil Spill and Response Organizations (OSRO's) that the plan cites;

(B) Federal, State, and local regulatory agencies that you must consult to obtain site specific environmental information; and

(C) Federal, State, and local regulatory agencies that you must notify when an oil spill occurs.

(2) Your methods to monitor and predict spill movement;

(3) Your methods to identify and prioritize the beaches, waterfowl, other marine and shoreline resources, and areas of special economic and environmental importance;

(4) Your methods to protect beaches, waterfowl, other marine and shoreline resources, and areas of special economic or environmental importance;
(5) Your methods to ensure that containment and recovery equipment as well as the response personnel are mobilized and deployed at the spill site;
(6) Your methods to ensure that devices for the storage of recovered oil are sufficient to allow containment and recovery operations to continue without interruption;

(7) Your procedures to remove oil and oiled debris from shallow waters and along shorelines and rehabilitating waterfowl which become oiled;
(8) Your procedures to store, transfer, and dispose of recovered oil and oil-contaminated materials and to ensure that all disposal is in accordance with Federal, State, and local requirements; and

(9) Your methods to implement your dispersant use plan and your in situ burning plan.

United States Coast Guard [33 CFR Part 154]

Scope of Regulation

Under 33 CFR Part 154, Subpart-F, the U.S. Coast Guard is responsible for regulating deepwater ports and transportation-related facilities located landward of the coastline. Facilities that because of their location could reasonably be expected to cause at least substantial harm to the environment by discharging oil into or on the navigable waters, adjoining shorelines, or exclusive economic zone are required to maintain a spill response plan.

Emergency Planning Requirements §

154.1030 General response plan contents.

(a) The plan must be written in English.

(b) A response plan must be divided into the sections listed in this paragraph and formatted in the order specified herein unless noted otherwise. It must also have some easily found marker identifying each section listed below. The following are the sections and subsections of a facility response plan:

(1) Introduction and plan contents.

(2) Emergency response action plan.

(i) Notification procedures.

(ii) Facility's spill mitigation procedures.

(iii) Facility's response activities.

(iv) Fish and wildlife and sensitive environments.

(v) Disposal plan.

(3) Training and Exercises:

(i) Training procedures.

(ii) Exercise procedures.

(4) Plan review and update procedures.

(5) Appendices.

(i) Facility-specific information.

(ii) List of contacts.

(iii) Equipment lists and records.

(iv) Communications plan.

(v) Site-specific safety and health plan.

(vi) List of acronyms and definitions.

(vii) A geographic-specific appendix for each zone in which a mobile facility operates.

(c) The required contents for each section and subsection of the plan are contained in §§154.1035, 154.1040, and 154.1041, as appropriate.

(d) The sections and subsections of response plans submitted to the COTP must contain at a minimum all the information required in §§154.1035, 154.1040, and 154.1041, as appropriate. It may contain other appropriate sections, subsections, or information that are required by other Federal, State, and local agencies.

(e) For initial and subsequent submission, a plan that does not follow the format specified in paragraph (b) of this section must be supplemented with a detailed cross-reference section to identify the location of the applicable sections required by this subpart.

(f) The information contained in a response plan must be consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR part 300) and the Area Contingency Plan(s) (ACP) covering the area in which the facility operates. Facility owners or operators shall ensure that their response plans are in accordance with the ACP in effect 6 months prior to initial plan submission or the annual plan review required under §154.1065(a). Facility owners or operators are not required to, but may at their option, conform to an ACP which is less than 6 months old at the time of plan submission.

§ 154.1035 Specific requirements for facilities that could reasonably be expected to cause significant and substantial harm to the environment.

(a) Introduction and plan content. This section of the plan must include facility and plan information as follows:

(1) The facility's name, street address, city, county, state, ZIP code, facility telephone number, and telefacsimile number, if so equipped. Include mailing address if different from street address.

(2) The facility's location described in a manner that could aid both a reviewer and a responder in locating the specific facility covered by the plan, such as, river mile or location from a known landmark that would appear on a map or chart.
(3) The name, address, and procedures for contacting the facility's owner or operator on a 24-hour basis.

(4) A table of contents.

(5) During the period that the submitted plan does not have to conform to the format contained in this subpart, a cross index, if appropriate.
(6) A record of change(s) to record information on plan updates.

(b) Emergency Response Action Plan. This section of the plan must be organized in the subsections described in this paragraph:
(1) Notification procedures. (i) This subsection must contain a prioritized list identifying the person(s), including name, telephone number, and their role in the plan, to be notified of a discharge or substantial threat of a discharge of oil. The telephone number need not be provided if it is listed separately in the list of contacts required in the plan. This Notification Procedures listing must include—
(A) Facility response personnel, the spill management team, oil spill removal organizations, and the qualified individual(s) and the designated alternate(s); and
(B) Federal, State, or local agencies, as required.

(ii) This subsection must include a form, such as that depicted in Figure 1, which contains information to be provided in the initial and follow-up notifications to Federal, State, and local agencies. The form shall include notification of the National Response Center as required in part 153 of this chapter. Copies of the form also must be placed at the location(s) from which notification may be made. The initial notification form must include space for the information contained in Figure 1. The form must contain a prominent statement that initial notification must not be delayed pending collection of all information.
(2) Facility's spill mitigation procedures. (i) This subsection must describe the volume(s) and oil groups that would be involved in the—

(A) Average most probable discharge from the Marine transportation-related (MTR) facility;

(B) Maximum most probable discharge from the MTR facility;

(C) Worst case discharge from the MTR facility; and

(D) Where applicable, the worst case discharge from the non-transportationrelated facility. This must be the same volume provided in the response plan for the non-transportation-related facility.

(ii) This subsection must contain prioritized procedures for facility personnel to mitigate or prevent any discharge or substantial threat of a discharge of oil resulting from operational activities associated with internal or external facility

transfers including specific procedures to shut down affected operations. Facility personnel responsible for performing specified procedures to mitigate or prevent any discharge or potential discharge shall be identified by job title. A copy of these procedures shall be maintained at the facility operations center. These procedures must address actions to be taken by facility personnel in the event of a discharge, potential discharge, or emergency involving the following equipment and scenarios:

(A) Failure of manifold, mechanical loading arm, other transfer equipment, or hoses, as appropriate;

(B) Tank overfill;

(C) Tank failure;

(D) Piping rupture;

(E) Piping leak, both under pressure and not under pressure, if applicable;

(F) Explosion or fire; and

(G) Equipment failure (e.g. pumping system failure, relief valve failure, or other general equipment relevant to operational activities associated with internal or external facility transfers.)

(iii) This subsection must contain a listing of equipment and the responsibilities of facility personnel to mitigate an average most probable discharge.

(3) Facility's response activities. (i) This subsection must contain a description of the facility personnel's responsibilities to initiate a response and supervise response resources pending the arrival of the qualified individual.

(ii) This subsection must contain a description of the responsibilities and authority of the qualified individual and alternate as required in §154.1026.

(iii) This subsection must describe the organizational structure that will be used to manage the response actions. This structure must include the following functional areas. (A) Command and control; (B) Public information; (C) Safety; (D) Liaison with government agencies; (E) Spill Operations; (F) Planning; (G) Logistics support; and (H) Finance.

(iv) This subsection of the plan must identify the oil spill removal organizations and the spill management team that will be capable of providing the following resources:

(A) Equipment and supplies to meet the requirements of §§154.1045, 154.1047, or subparts H or I of this part, as appropriate.

(B) Trained personnel necessary to continue operation of the equipment and staff the oil spill removal organization and spill management team for the first 7 days of the response.

(v) This section must include job descriptions for each spill management team member within the organizational structure described in paragraph (b)(3)(iii) of this section. These job descriptions must include the responsibilities and duties of each spill management team member in a response action.

(vi) For facilities that handle, store, or transport group II through group IV petroleum oils, and that operate in waters where dispersant use is pre-authorized, this subsection of the plan must also separately list the resource providers and specific resources, including appropriately trained dispersant-application personnel, necessary to provide the dispersant capabilities required in this subpart. All resource providers and resources must be available by contract or other approved means as described in §154.1028(a). The dispersant resources to be listed within this section must include the following:

(A) Identification of each primary dispersant staging site to be used by each dispersant-application platform to meet the requirements of this subpart.

(B) Identification of the platform type, resource-providing organization, location, and dispersant payload for each dispersant-application platform identified. Location data must identify the distance between the platform's home base and the identified primary dispersant staging site for this section.

(C) For each unit of dispersant stockpile required to support the effective daily application capacity (EDAC) of each dispersant-application platform necessary to sustain each intended response tier of operation, identify the dispersant product resource provider, location, and volume. Location data must include the stockpile's distance to the primary staging sites where the stockpile would be loaded onto the corresponding platforms.

(D) If an oil spill removal organization has been evaluated by the Coast Guard, and its capability is equal to or exceeds the response capability needed by the owner or operator, the section may identify only the oil spill removal organization, and not the information required in paragraphs (b)(3)(vi)(A) through (b)(3)(vi)(C) of this section.

(vii) This subsection of the plan must also separately list the resource providers and specific resources necessary to provide aerial oil tracking capabilities required in this subpart. The oil tracking resources to be listed within this section must include the following:

(A) The identification of a resource provider; and

(B) Type and location of aerial surveillance aircraft that are ensured available, through contract or other approved means, to meet the oil tracking requirements of §154.1045(j).

(viii) For mobile facilities that operate in more than one COTP zone, the plan must identify the oil spill removal organization and the spill management team in the applicable geographic-specific appendix. The oil spill removal organization(s) and the spill management team discussed in paragraph (b)(3)(iv) of this section must be included for each COTP zone in which the facility will handle, store, or transport oil in bulk.

(ix) For mobile facilities that operate in more than one COTP zone, the plan must identify the oil spill removal organization and the spill management team in the applicable geographic-specific appendix. The oil spill removal organization(s) and the spill management team discussed in paragraph (b)(3)(iv)(A) of this section must be included for each COTP zone in which the facility will handle, store, or transport oil in bulk.

(4) Fish and wildlife and sensitive environments. (i) This section of the plan must identify areas of economic importance and environmental sensitivity, as identified in the ACP, which are potentially impacted by a worst case discharge. ACPs are required under section 311(j)(4) of the Federal Water Pollution Control Act (FWPCA) to identify fish and wildlife and sensitive environments. The applicable ACP shall be used to designate fish and wildlife and sensitive environments in the plan. Changes to the ACP regarding fish and wildlife and sensitive environments shall be included in the annual update of the response plan, when available.

(ii) For a worst case discharge from the facility, this section of the plan must—

(A) List all fish and wildlife and sensitive environments identified in the ACP which are potentially impacted by a discharge of persistent oils, non-persistent oils, or non-petroleum oils.

(B) Describe all the response actions that the facility anticipates taking to protect these fish and wildlife and sensitive environments.

(C) Contain a map or chart showing the location of those fish and wildlife and sensitive environments which are potentially impacted. The map or chart shall also depict each response action that the facility anticipates taking to protect these areas. A legend of activities must be included on the map page.

(iii) For a worst case discharge, this section must identify appropriate equipment and required personnel, available by contract or other approved means as described in §154.1028, to protect fish and wildlife and sensitive environments which fall within the distances calculated using the methods outlined in this paragraph as follows:

(A) Identify the appropriate equipment and required personnel to protect all fish and wildlife and sensitive environments in the ACP for the distances, as calculated in paragraph (b)(4)(iii)(B) of this section, that the persistent oils, nonpersistent oils, or non-petroleum oils are likely to travel in the noted geographic area(s) and number of days listed in table 2 of appendix C of this part;

(B) Calculate the distances required by paragraph (b)(4)(iii)(A) of this section by selecting one of the methods described in this paragraph;

(1) Distances may be calculated as follows:

(i) For persistent oils and non-petroleum oils discharged into non-tidal waters, the distance from the facility reached in 48 hours at maximum current.

(ii) For persistent and non-petroleum oils discharged into tidal waters, 15 miles from the facility down current during ebb tide and to the point of maximum tidal influence or 15 miles, whichever is less, during flood tide.

(iii) For non-persistent oils discharged into non-tidal waters, the distance from the facility reached in 24 hours at maximum current.

(iv) For non-persistent oils discharged into tidal waters, 5 miles from the facility down current during ebb tide and to the point of maximum tidal influence or 5 miles, whichever is less, during flood tide.

(2) A spill trajectory or model may be substituted for the distances calculated under paragraph (b)(4)(iii)(B)(l) of this section. The spill trajectory or model must be acceptable to the COTP.

(3) The procedures contained in the Environmental Protection's Agency's regulations on oil pollution prevention for non-transportation-related onshore facilities at 40 CFR part 112, appendix C, Attachment C-III may be substituted for the distances listed in non-tidal and tidal waters; and

(C) Based on historical information or a spill trajectory or model, the COTP may require the additional fish and wildlife and sensitive environments also be protected.

(5) Disposal Plan. This subsection must describe any actions to be taken or procedures to be used to ensure that all recovered oil and oil contaminated

debris produced as a result of any discharge are disposed according to Federal, state, or local requirements.

(c) Training and exercises. This section must be divided into the following two subsections:

(1) Training procedures. This subsection must describe the training procedures and programs of the facility owner or operator to meet the requirements in §154.1050.

(2) Exercise procedures. This subsection must describe the exercise program to be carried out by the facility owner or operator to meet the requirements in §154.1055.

(d) Plan review and update procedures. This section must address the procedures to be followed by the facility owner or operator to meet the requirements of §154.1065 and the procedures to be followed for any post-discharge review of the plan to evaluate and validate its effectiveness.

(e) Appendices. This section of the response plan must include the appendices described in this paragraph.

(1) Facility-specific information. This appendix must contain a description of the facility's principal characteristics.

(i) There must be a physical description of the facility including a plan of the facility showing the mooring areas, transfer locations, control stations, locations of safety equipment, and the location and capacities of all piping and storage tanks.

(ii) The appendix must identify the sizes, types, and number of vessels that the facility can transfer oil to or from simultaneously.

(iii) The appendix must identify the first valve(s) on facility piping separating the transportation-related portion of the facility from the non-transportation-related portion of the facility, if any. For piping leading to a manifold located on a dock serving tank vessels, this valve is the first valve inside the secondary containment required by 40 CFR part 112.

(iv) The appendix must contain information on the oil(s) and hazardous material handled, stored, or transported at the facility in bulk. A material safety data sheet meeting the requirements of 29 CFR 1910.1200, 33 CFR 154.310(a)(5) or an equivalent will meet this requirement. This information can be maintained separately providing it is readily available and the appendix identifies its location. This information must include—

(A) The generic or chemical name;

(B) A description of the appearance and odor;

(C) The physical and chemical characteristics;

(D) The hazards involved in handling the oil(s) and hazardous materials. This shall include hazards likely to be encountered if the oil(s) and hazardous materials come in contact as a result of a discharge; and
(E) A list of firefighting procedures and extinguishing agents effective with fires involving the oil(s) and hazardous materials.

(v) The appendix may contain any other information which the facility owner or operator determines to be pertinent to an oil spill response.

(2) List of contacts. This appendix must include information on 24-hour contact of key individuals and organizations. If more appropriate, this information may be specified in a geographic-specific appendix. The list must include—
(i) The primary and alternate qualified individual(s) for the facility;

(ii) The contact(s) identified under paragraph (b)(3)(iv) of this section for activation of the response resources; and

(iii) Appropriate Federal, State, and local officials.

(3) Equipment list and records. This appendix must include the information specified in this paragraph.

(i) The appendix must contain a list of equipment and facility personnel required to respond to an average most probable discharge, as defined in §154.1020. The appendix must also list the location of the equipment.

(ii) The appendix must contain a detailed listing of all the major equipment identified in the plan as belonging to an oil spill removal organization(s) that is available, by contract or other approved means as described in §154.1028(a), to respond to a maximum most probable or worst case discharge, as defined in §154.1020. The detailed listing of all major equipment may be located in a separate document referenced by the plan. Either the appendix or the separate document referenced in the plan must provide the location of the major response equipment.

(iii) It is not necessary to list response equipment from oil spill removal organization(s) when the organization has been classified by the Coast Guard and their capacity has been determined to equal or exceed the response

capability needed by the facility. For oil spill removal organization(s) classified by the Coast Guard, the classification must be noted in this section of the plan. When it is necessary for the appendix to contain a listing of response equipment, it shall include all of the following items that are identified in the response plan: Skimmers; booms; dispersant application, in-situ burning, bioremediation equipment and supplies, and other equipment used to apply other chemical agents on the NCP Product Schedule (if applicable); communications, firefighting, and beach cleaning equipment; boats and motors; disposal and storage equipment; and heavy equipment. The list must include for each piece of equipment—

(A) The type, make, model, and year of manufacture listed on the nameplate of the equipment;

(B) For oil recovery devices, the effective daily recovery rate, as determined using section 6 of appendix C of this part;

(C) For containment boom, the overall boom height (draft and freeboard) and type of end connectors;

(D) The spill scenario in which the equipment will be used for or which it is contracted;

(E) The total daily capacity for storage and disposal of recovered oil;

(F) For communication equipment, the type and amount of equipment intended for use during response activities. Where applicable, the primary and secondary radio frequencies must be specified.

(G) Location of the equipment; and

(H) The date of the last inspection by the oil spill removal organization(s).

(4) Communications plan. This appendix must describe the primary and alternate method of communication during discharges, including communications at the facility and at remote locations within the areas covered by the response plan. The appendix may refer to additional communications packages provided by the oil spill removal organization. This may reference another existing plan or document.

(5) Site-specific safety and health plan. This appendix must describe the safety and health plan to be implemented for any response location(s). It must provide as much detailed information as is practicable in advance of an actual discharge. This appendix may reference another existing plan requiring under 29 CFR 1910.120.

(6) List of acronyms and definitions. This appendix must list all acronyms used in the response plan including any terms or acronyms used by Federal, State, or local governments and any operational terms commonly used at the facility. This appendix must include all definitions that are critical to understanding the response plan.

[CGD 91–036, 61 FR 7917, Feb. 29, 1996, as amended by USCG–2000–7223, 65 FR 40058, June 29, 2000; USCG–2001–9286, 66 FR 33641, June 25, 2001; USCG–2008–0179, 73 FR 35014, June 19, 2008; USCG–2001–8661, 74 FR 45023, Aug. 31, 2009]

§ 154.1041 Specific response information to be maintained on mobile MTR facilities.

(a) Each mobile MTR facility must carry the following information as contained in the response plan when performing transfer operations:

(1) A description of response activities for a discharge which may occur during transfer operations. This may be a narrative description or a list of procedures to be followed in the event of a discharge.

(2) Identity of response resources to respond to a discharge from the mobile MTR facility.

(3) List of the appropriate persons and agencies (including the telephone numbers) to be contacted in regard to a discharge and its handling, including the National Response Center.

(b) The owner or operator of the mobile facility must also retain the information in this paragraph at the principal place of business. § 154.1047 Response plan development and evaluation criteria for facilities that handle, store, or transport Group V petroleum oils.

(a) An owner or operator of a facility that handles, stores, or transports Group V petroleum oils must provide information in his or her response plan that identifies—

(1) Procedures and strategies for responding to a worst case discharge of Group V petroleum oils to the maximum extent practicable; and

(2) Sources of the equipment and supplies necessary to locate, recover, and mitigate such a discharge.

(b) An owner or operator of a facility that handles, stores, or transports Group V petroleum oil must ensure that any equipment identified in a response plan is capable of operating in the conditions expected in the geographic area(s) in

which the facility operates using the criteria in Table 1 of appendix C of this part. When evaluating the operability of equipment, the facility owner or operator must consider limitations that are identified in the ACPs for the COTP zones in which the facility operates, including—

(1) Ice conditions;

(2) Debris;

(3) Temperature ranges; and

(4) Weather-related visibility.

(c) The owner or operator of a facility that handles, stores, or transports Group V petroleum oil must identify the response resources that are available by contract or other approved means as described in §154.1028. The equipment identified in a response plan must include—

(1) Sonar, sampling equipment, or other methods for locating the petroleum oil on the bottom or suspended in the water column;

(2) Containment boom, sorbent boom, silt curtains, or other methods for containing the petroleum oil that may remain floating on the surface or to reduce spreading on the bottom;

(3) Dredges, pumps, or other equipment necessary to recover petroleum oil from the bottom and shoreline;

(4) Equipment necessary to assess the impact of such discharges; and

(5) Other appropriate equipment necessary to respond to a discharge involving the type of petroleum oil handled, stored, or transported.

(d) Response resources identified in a response plan for a facility that handles, stores, or transports Group V petroleum oils under paragraph (c) of this section must be capable of being at the spill site within 24 hours of discovery of a discharge.

(e) A response plan for a facility that handles, stores, or transports Group V petroleum oils must identify response resources with firefighting capability. The owner or operator of a facility that does not have adequate firefighting resources located at the facility or that can not rely on sufficient local firefighting resources must identity and ensure, by contract or other approved means as described in §154.1028, the availability of adequate firefighting resources. The response plan must also identify an individual located at the facility to work with the fire department for petroleum oil fires. This individual

shall also verify that sufficient well-trained firefighting resources are available within a reasonable response time to a worst case scenario. The individual may be the qualified individual as defined in §154.1020 and identified in the response plan or another appropriate individual located at the facility.

TASK 1.6 SUMMARIZE FEDERAL AND STATE PIPELINE PERMITTING REQUIREMENTS FOR PIPELINE EMERGENCY RESPONSE PLANS

All pipeline operators must follow specific federal, state, and local permitting requirements. Federal environmental permitting requirements are established by the U.S. Army Corps of Engineers, U.S. Fish and Wildlife, Bureau of Land Management, U.S. Forest Service, and others.

The number of agencies and specific permits required will vary depending on the route, type of land crossed, or ecological resources impacted. The following provides an overview of the various agencies that may require a permit from a pipeline operator.

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission **(**FERC) is responsible for authorizing the construction and operation of interstate natural gas pipelines. It issues certificates of public convenience and necessity for such pipelines under section 7 of the Natural Gas Act of 1938, as amended (the "NGA"), and authorizes the construction and siting of facilities for the import or export of natural gas under section 3 of the NGA. It also authorizes the construction and operation of natural gas pipelines pursuant to the Natural Gas Policy Act.

FERC maintains a three part process for issuing a permit for natural gas pipelines. This includes the Applicant's Process, the Application Process, and the Construction Process. A review of FERC's permit process did not indicate any requirements for submitting an emergency response plan prior to completing construction.

U.S. Fish & Wildlife Service

The Fish and Wildlife Service (FWS), within the Department of the Interior, is responsible for the conservation, protection and enhancement of fish, wildlife, plants and their habitats. The FWS has principal trust responsibility to protect and conserve migratory birds, threatened and endangered species, certain marine mammals, and interjurisdictional fish. The FWS manages the National Wildlife Refuge System ("NWRS"). Applicants for pipeline construction projects are required to consult with the FWS on projects potentially affecting any of these resources. The FWS also consults on projects potentially affecting fresh water or

marine resources and water quality. In addition, the FWS may authorize use by permit for areas within the NWRS.

Bureau of Land Management

The Bureau of Land Management **(**BLM), within the Department of the Interior, is responsible for the management of public lands. The BLM is principally responsible for issuing right-of-way permits authorizing natural gas pipelines to cross federal lands. Section 28 of the Mineral Leasing Act of 1920, as amended, gives BLM the authority to issue right-of-way permits for natural gas pipelines through lands held by the United States, except lands in the National Park System, lands held in trust for an Indian or Indian tribe, and lands on the Outer Continental Shelf.

National Park Service

The National Park Service (NPS) within the Department of the Interior, may issue right-of-way permits only for those uses or activities specifically authorized by Congress and only if there is no practicable alternative to such use of NPS lands. There are no general authorities for issuance of right-of-way permits for gas or other petroleum product pipelines across units of the National Park System. However, in individual instances, park- specific legislation may provide for such authorizations.

Minerals Management Service

The Minerals Management Service **(**MMS), within the Department of the Interior, is responsible for issuing and enforcing regulations to promote safe operations, environmental protection, and resource conservation on the Outer Continental Shelf ("OCS"). The MMS is responsible for granting rights-of-way through submerged lands of the OCS. In addition, the MMS establishes and enforces pipeline safety requirements for those OCS pipelines within the jurisdiction of Department of the Interior. 30 C.F.R. § 250.1001.

Bureau of Reclamation

The Bureau of Reclamation (Reclamation), within the Department of the Interior, is responsible for managing, developing, and protecting water and related resources in an environmentally and economically sound manner in the interest of the public. Reclamation may grant rights-of-way for natural gas pipelines and other uses where compatible with project purposes as authorized in section 10 of the Act of August 4, 1939, and section 28 of the Mineral Leasing Act of 1920, as amended.

Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA), within the Department of the Interior, is charged with responsibility to administer federal Indian policy and to discharge the federal trust for American Indian Tribes, Alaska Native villages and tribal organizations. BIA is responsible for, among other things, approving rights-ofway across lands held in trust for an Indian or Indian Tribe. In addition, regarding natural gas and all rights-of-way for energy resource transport, BIA must consult and coordinate through Government-to-Government relations with any affected Tribe.

U.S. Forest Service

The Forest Service (FS), within the Department of Agriculture, is responsible for the management of 192 million acres of National Forest System ("NFS") lands. Many hundreds of miles of natural gas pipelines cross NFS lands. Most of these pipelines are permitted by a BLM-issued right-of-way grant, pursuant the authority granted to the Secretary of the Interior in section 28 of the Mineral Leasing Act.

U.S. Army Corps of Engineers

The Army Corps of Engineers ("COE") is responsible for the administration of laws for the protection and preservation of waters of the United States, including wetlands. Pursuant to the requirements of section 10 of the Rivers and Harbors Act of 1899, and section 404 of the Clean Water Act (CWA), the COE may issue authorizations for the discharge of dredged or fill material into navigable waters, including wetlands.

Pipeline and Hazardous Materials Safety Administration

The Pipeline and Hazardous Materials Safety Administration (PHMSA), within the Department of Transportation, is responsible for establishing safety standards for the nation's pipeline transportation system. PHMSA carries out this responsibility through its Office of Pipeline Safety ("OPS"). OPS establishes and enforces minimum safety standards for the design, construction, operation and maintenance of pipeline facilities. 49 U.S.C. § 60101 et seq.

Environmental Protection Agency

The Environmental Protection Agency ("EPA") is responsible for administering a wide variety of environmental laws. The responsibilities of EPA relevant to the pipeline permitting process include commenting on Environmental Impact Statements under section 309 of the Clean Air Act (CAA), the authority to participate in the Section 404 permit process and to restrict, in certain circumstances, the use of specific areas as disposal sites for dredged or fill

material pursuant to section 404, and the authority to issue permits for pipeline-related activities that involve discharges of pollutants subject to the requirements of the National Pollutant Discharge Elimination System or emissions that may be subject to permitting requirements under the CAA (unless the programs are being administered by a state authorized or approved by EPA).

National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA), within the Department of Commerce and through offices such as the National Marine Fisheries Service and the National Ocean Service, is responsible for a variety of activities in marine and coastal ecosystems as mandated by several statutes and authorities. These activities include managing protected species; managing commercial and recreational fisheries; protecting marine and coastal habitats; working with states to develop and implement comprehensive coastal zone management plans; and protecting and managing designated Marine Sanctuaries. Pipeline project construction in coastal and/or ocean areas may overlap with several NOAA responsibilities depending on the location and type of project.

Source: Interagency Agreement on Early Coordination of Required Environmental and Historic Preservation Reviews Conducted in Conjunction with the Issuance of Authorizations to Construct and Operate Interstate Natural Gas Pipelines Certificated By the Federal Energy Regulatory Commission, May 2002.

TASK 1.7-A SUMMARIZE TRIBAL REGULATIONS GOVERNING PIPELINE EMERGENCY RESPONSE PLANS

General Background

Native American Tribes are sovereign nations and manage their own affairs. As such, the U.S. Department of Transportation does not have any jurisdiction on building or operating pipelines on tribal lands unless the pipeline is intrastate or interstate. If the pipeline does not fall under the jurisdiction of the U.S. Department of Transportation and a private entity wants to build a pipeline on tribal lands the prospective owner or operator negotiates directly with the respective tribe and can do so without involvement of either the Department of Transportation or the Department of Interior.

The research team conducted an analysis of all 50 States to determine the most significant pipeline incidents for the period 2001 to 2011.

The U.S. Department of the Interior Indian Affairs Tribal Directory lists 34 States with Federally recognized Indian Tribes. Alaska has the greatest number of tribes (40%) followed by California (19%) and Oklahoma (7%).

Organizations Involved In The Pipeline Permit Process

Department of Interior, Bureau of Indian Affairs

The Department of Interior, Bureau of Indian Affairs authorizes oil and gas pipeline rights-of-way grants across tribal lands under 25 CFR 169.25.

25 CFR Part 224 provides that Indian tribes, at their discretion, may enter into business agreements and leases for energy resource development and grant rights-of way for transmission or distribution pipelines on tribal land without the Secretary of the Department of Interior's review or approval. Indian tribes entering into such business agreements, leases, and grants of rights-of-way must execute them under an approved Tribal Energy Resource Agreement (TERA) between the Secretary and the tribe.

Department of Transportation, Pipeline and Hazardous Materials Administration

If an operational interstate or intrastate pipeline crosses tribal lands then the Pipeline and Hazardous Materials Administration has jurisdiction under its existing pipeline regulations, e.g., 49 CFR Part 192 or Part 194. There are emergency planning requirements under PHMSA's authority are described in Task 1.1 and Task 1.3 of this report.

The Council of Energy Resource Tribes (CERT)

The Council of Energy Resource Tribes (CERT) was founded by Indian Tribes as a distinct resource providing advice and support for Tribes in developing and sustaining long-term energy goals. CERT's primary goal is to help Tribes build stable, balanced, self-governed economies, according to each Tribe's vision and priority.

CERT helps Tribes attain the confidence needed to chart a new course of development addressing Tribal priorities and values while contributing to a more secure energy future for all Americans.

Since the inception of CERT, farsighted Tribal leaders have dramatically restructured the federal-Indian relationship regarding oil, gas, and mineral development on Indian lands and have formed partnerships with leaders in the industry.

CERT member Tribes have absolute control of their valuable resources and utilize an Energy Resource Assessment to design strategic techniques that contribute to improving the Tribes' management capabilities. The Tribes manage all aspects of their resources--from negotiating agreements, protecting the environment, understanding the value of water and other resources, to verifying revenue payments, and preparing to respond to emergencies.

Emergency Planning Requirements

The following general observations apply to oil or gas pipelines that may originate, terminate, or transit tribal lands:

1. While there are numerous agencies involved in the pipeline permitting process, the research team could not identify specific requirements for emergency response plans prior to the construction and operation of the pipeline.

2. If the pipeline originates and terminates on tribal land, the responsibility for developing and implementing emergency planning associated with the pipeline resides with the individual tribe and any private entity that enters into a business arrangement with the tribe. As such the pipeline is not under the jurisdiction of the federal government.

3. If the pipeline is intra-state or inter-state and passes through tribal lands, the pipeline falls under the jurisdiction of the U.S. Department of Transportation and the operator is subject to the emergency planning requirements of 49 CFR.

4. If the pipeline transports hazardous materials, including natural gas and other gas liquids, and is being constructed by a "grantee" for the Bureau of Indian Affairs, then it must comply with 49 CFR, Subchapter C, Parts 172 and 173; Subchapter D, Pipeline Safety, and Parts 190, 191, 192, and 195.

Sources:

1. 25 CFR Part 169.25.

2. 25 CFR Part 224

3. Tribal Energy Resource Agreements Under Indian Tribal Energy Development and Self-Determination Act.

4. September 1, 2012 interview with Mr. Jeff Wiese, et. al., Pipeline and Hazardous Materials Administration, Washington, D.C.

5. U.S. Department of Interior Indian Affairs Tribal Directory.

6. Applicable Federal Health

TASK 1.7-B SUMMARIZE STATE REGULATIONS AND ORDINANCES GOVERNING EMERGENCY RESPONSE PLANS

ALABAMA

The Alabama Public Service Commission inspects, regulates and enforces interstate gas and hazardous liquid pipeline safety requirements within the State of Alabama.

Through certification by the Department of Transportation Office of Pipeline Safety (OPS), the state of Alabama regulates, inspects, and enforces intrastate gas and hazardous liquid pipeline safety requirements. This work is performed by Gas Pipeline Safety Section of the Alabama Public Service Commission.

Emergency Planning Requirements

Rule 3 – Emergency Plans – Filings: All public utilities and persons, as defined by Section 37-4-80(1) or Section 37-4-90(1), Code of Alabama 1975, shall file with this Commission on or before the effective date of these rules, an emergency plan which meets the requirements of Title 49 C.F.R. Part 192.615 or 195.402, et seq.

Rule 4 – Updating of Filings: All public utilities and persons, as defined by Section 37-4-80(1) or Section 37-4-90(1), Code of Alabama 1975, shall keep current the filings required by Rules 2 and 3 by filing with this Commission, within 10 days of adoption, any amendments, revisions, substitutes or revisions of the filings required by Rules 2 and 3.

Source:

Alabama Public Service Commission
P. O. Box 304260 Montgomery, AL 36130-4260
Administrator, Gas Pipeline Safety Office: 334-242-5780;
Fax: 334-242-0687

Alaska

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), Alaska District Office has overall regulatory responsibility for hazardous liquid and gas pipelines in the State of Alaska. OPS inspects, regulates, and enforces interstate and intrastate gas and liquid pipeline safety requirements throughout the State.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations

Source:

Office of Pipeline Safety – Alaska District Office
188 W. Northern Lights Blvd., Suite 520
Anchorage, AK 99503 Telephone: 907-271-6517

Arizona

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and enforces interstate gas and liquid pipeline safety requirements in Arizona.

As an Interstate Agent of OPS, the Arizona Corporation Commission inspects interstate gas and liquid systems on behalf of OPS and has full responsibility for regulation, inspection and enforcement of intrastate gas and liquid systems consistent with minimum federal standards. This work is performed by the Pipeline Safety Section, Gas Services Division of the Arizona Corporation Commission.

Emergency Planning Requirements

In addition to enforcing federal pipeline standards, the State of Arizona, under the Arizona Administrative Code Title 14, Public Service Corporations, also enforces the following requirements:

Article 2 Pipeline Safety R14-5-202, Construction and Safety Standards - Applicability: This rule applies to the construction, reconstruction, repair, operation and maintenance of all intrastate natural gas, other gas, LNG and hazardous liquid pipeline systems, as described in A.R.S. § 40-441.

D. Operators of an intrastate pipeline will file with the Commission an Operation and Maintenance Plan (O & M), including an emergency plan, 30 days prior to placing a pipeline system into operation. Any changes in existing plans will be filed within 30 days of the effective date of the change.

R14-5-205, Master Meter System Operators, D. Operators of a master meter system will establish an Operation and Maintenance Plan (O & M) including an emergency plan. The plans must be maintained at the master meter system location.

Source:

Arizona Corporation Commission 2200 N. Central Ave., Suite 300 Phoenix, Arizona 85004 Office: 602-262-5601; Fax: 602-262-5620

Arkansas

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and enforces interstate gas and liquid pipeline safety requirements in Arkansas. This work is performed on behalf of OPS by the Arkansas Public Service Commission.

Emergency Planning Requirements

In addition to enforcing federal pipeline standards, the State of Arkansas enforces the following additional emergency planning requirements:

Arkansas Gas Pipeline Code § 192.615 Emergency Plans (a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

(1) Receiving, identifying, and classifying notices of events which require immediate response by the operator.

(2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.

(3) Prompt and effective response to a notice of each type of emergency, including the following:

(i) Gas detected inside or near a building. (ii) Fire located near or directly involving a pipeline facility. (iii) Explosion occurring near or directly involving a pipeline facility. (iv) Natural disaster.

(4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.

(5) Actions directed toward protecting people first and then property.

(6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

(7) Making safe any actual or potential hazard to life or property.

(8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

(9) Safely restoring any service outage.

(10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible.

(11) Actions required to be taken by a controller during an emergency in accordance with § 192.631.

(b) Each operator shall:

(1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures.

(2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.

(3) Review employee activities to determine whether the procedures were effectively followed in each emergency.

(c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

(1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;

(2) Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;

(3) Identify the types of gas pipeline emergencies of which the operator notifies the officials; and

(4) Plan how the operator and officials can engage in mutual assistance to

minimize hazards to life or property.

(d) Maintain a current map of the entire gas system or sectional maps of large systems. These maps will be of sufficient detail to approximate the location of mains and transmission lines.

(e) Identify all key valves which may be necessary for the safe operation of the system. The location of these valves shall be designated on appropriate records, drawings or maps.

§ 193.2509 Emergency procedures (a) Each operator shall determine the types and places of emergencies other than fires that may reasonably be expected to occur at an LNG plant due to operating malfunctions, structural collapse, personnel error, forces of nature, and activities adjacent to the plant.

(b) To adequately handle each type of emergency identified under paragraph (a) of this section and each fire emergency, each operator shall follow one or more manuals of written procedures.

The procedures must provide for the following:

(1) Responding to controllable emergencies, including notifying personnel and using equipment appropriate for handling the emergency.

(2) Recognizing an uncontrollable emergency and taking action to minimize harm to the public and personnel, including prompt notification of appropriate local officials of the emergency and possible need for evacuation of the public in the vicinity of the LNG plant.

(3) Coordinating with appropriate local officials in preparation of an emergency evacuation plan, which sets forth the steps required to protect the public in the event of an emergency, including catastrophic failure of an LNG storage tank.

(4) Cooperating with appropriate local officials in evacuations and emergencies requiring mutual assistance and keeping these officials advised of: (i)The LNG plant fire control equipment, its location, and quantity of units located throughout the plant; (ii) Potential hazards at the plant, including fires; (iii) Communication and emergency control capabilities at the LNG plant; and, (iv) The status of each emergency.

§ 193.2903 Security procedures - Each operator shall prepare and follow one or more manuals of written procedures to provide security for each LNG plant. The procedures must be available at the plant in accordance with § 193.2017 and include at least:

(a) A description and schedule of security inspections and patrols performed in accordance with § 193.2913;

(b) A list of security personnel positions or responsibilities utilized at the LNG plant;

(c) A brief description of the duties associated with each security personnel position or responsibility;

(d) Instructions for actions to be taken, including notification of other appropriate plant personnel and law enforcement officials, when there is any indication of an actual or attempted breach of security;

(e) Methods for determining which persons are allowed access to the LNG plant;

(f) Positive identification of all persons entering the plant and on the plant, including methods at least as effective as picture badges; and,

(f) Liaison with local law enforcement officials to keep them informed about current security procedures under this section.

Source:

Arkansas Public Service Commission
P.O. Box 400 Little Rock, AR 72203-0400 1000 Center Street
Little Rock, AR 72201 Office: 501-682-5716; Fax: 501-682-5340

California

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and enforces interstate gas and liquid pipeline safety requirements in California. Through certification by OPS, the state of California regulates, inspects, and enforces intrastate gas and liquid pipeline safety requirements. By signed agreement with OPS, California also inspects interstate liquid pipeline safety requirements. The California Office of the State Fire Marshal performs this work.

The State Fire Marshal regulates the safety of approximately 5,500 miles of intrastate hazardous liquid transportation pipelines and acts as an agent of the federal Office of Pipeline Safety concerning the inspection of more than 2,000

miles of interstate pipelines. Pipeline Safety staff inspect, test, and investigate to ensure compliance with all federal and state pipeline safety laws and regulations.

The State Fire Marshal's office does not oversee Gas Pipelines. This responsibility resides with the Public Utilities Commission (PUC). The PUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing.

Emergency Planning Requirements - 51010.6. Notwithstanding Section 51010.5, that portion of an interstate pipeline which is located within this state and is subject to an agreement between the United States Secretary of Transportation and the State Fire Marshal is subject to the federal Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. Sec. 2001 et seq.), the Pipeline Safety Reauthorization Act of 1988 (Pub. L.100-561), and federal pipeline safety regulations.

51012.3**.** (a) Every operator of a pipeline shall conform the pipeline to the federal regulations in Subparts A to F, inclusive, of Part 195 of Title 49 of the Code of Federal Regulations, as those regulations may be hereafter amended

51015. (a) Every pipeline operator shall provide to the fire department having fire suppression responsibilities a map or suitable diagram showing the location of the pipeline, a description of all products transported within the pipeline, and a contingency plan for pipeline emergencies which shall include, but not be limited to any reasonable information which the State Fire Marshal may require.

(b) A pipeline operator shall make available to the State Fire Marshal, or any officers or employees authorized by the State Fire Marshal, upon presentation of appropriate credentials, any records, maps, and written procedures that are required, by this chapter, to be kept by the pipeline operator and which concern accident reporting, design, construction, testing, or operation and maintenance.

The State Fire Marshal, or any officer or employee authorized by the State Fire Marshal, may enter, inspect, and examine, at reasonable times and in a reasonable manner, the records and properties of any pipeline operators that are required to be inspected and examined to determine whether the pipeline operator is in compliance with this chapter.

(c) Every pipeline operator shall offer to meet with the local fire department having fire suppression responsibilities at least once each calendar year to discuss and review contingency plans for pipeline emergencies.

51015.2. (a) The Legislature recognizes that hazardous liquid pipelines are often located alongside and in the immediate proximity of rail lines. In the event of a derailment, these pipelines may be damaged in such a fashion that their integrity is lost, making a rupture or leak more likely.

In an effort to better protect public safety, the State Fire Marshal shall adopt regulations governing the construction, testing, operations, periodic inspection, and emergency operations of intrastate hazardous liquid pipelines located within 500 feet of any rail line. These regulations shall, at a minimum, include provisions dealing with the following:

(1) Minimum depth of cover for newly constructed or reconstructed pipelines.
(2) Minimum hydrostatic testing requirements for newly constructed pipelines.
(3) Minimum requirements for testing existing pipelines which may have been affected by a derailment.
(4) Minimum requirements for periodic inspections.
(5) Minimum requirements for installation and operation of safety or check valves.
(6) Procedures for developing, testing, approving, and implementing coordinated emergency contingency plans prepared by pipeline and rail operators. These procedures shall also provide for consultation with local affected agencies, and require pipeline and rail operations to develop and implement emergency training for their employees approved by the State Fire Marshal.

Sources:

Office of California State Fire Marshal
Pipeline Safety Division 3950 Paramount Blvd, #210 Lakewood, CA 90712 Fax: 562-497-9104

Gas Pipelines California Public Utilities Commission 320 West 4th Street, Suite 500 Los Angeles, CA 90013 Office: 213-576-7019; Fax: 213-576-7013

Colorado

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and enforces interstate gas and liquid pipeline safety requirements in Colorado.

OPS inspects, regulates and enforces interstate gas pipeline safety requirements in Colorado. OPS also inspects, regulates and enforces both intrastate and

interstate liquid pipeline safety requirements in Colorado.

Through certification by OPS, the state of Colorado regulates, inspects, and enforces *intrastate* gas pipeline safety requirements. The Gas Pipeline Safety Division of the Colorado Public Utilities Commission performs this work.

Emergency Planning Requirements

The Colorado Public Utilities Commission's (PUC) Pipeline Safety Group is charged with enforcing the state's gas pipeline safety regulations in compliance with State Code 4, 723-4 Part 4. 4 CCR 723-1 Part 1 covers Rules of Practice and Procedure and 4 CCR 723-4 Part 4 - Rules Regulating Gas Utilities and Pipeline Operators. There are no rules in these regulations pertaining to emergency response plans.

Source:

Colorado Public Utilities Commission 1560
Broadway, Suite 250 Denver, CO 80202
Office: 303-894-2851; Fax: 303-894-2065

Connecticut

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects the interstate and intrastate liquid pipeline operations in Connecticut.

Through certification by OPS, the state of Connecticut regulates and inspects intrastate and interstate gas pipeline operators in Connecticut. This work is performed by the Connecticut Department of Public Utility Control.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Connecticut Department of Public Utility Control
10 Franklin Square New Britain, CT 06051 Office:
860-827-2661; Fax: 860-827-2613

Delaware

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects both the gas and liquid interstate pipeline operators in Delaware.

Through agreement with OPS, the state of Delaware inspects the intrastate gas pipeline operators in Delaware. This work is performed by the Delaware Public Service Commission.

Emergency Planning Requirements

Title 26 Public Utilities, 8000 Gas Regulations 8001 Rules to Establish an Intrastate Gas Pipeline Safety Compliance Program for Delaware

2.1 The minimum standards governing the design, construction, fabrication, installation, inspection, reporting, testing, operation, maintenance, protection, and the safety aspects of operation and maintenance of Regulated Facilities shall be those standards set forth in Parts 191, 192 and 193 of the Federal Regulations, as applicable.

Source:

Delaware Public Service Commission 861 Silver Lake Boulevard,
Cannon Bldg, Suite 100 Dover, DE 19904 Office: 302-736-7526;
Fax: 302-739-5258

District of Columbia

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in the District of Columbia.

Through certification by OPS, the District of Columbia regulates and inspects the gas intrastate operators in the District of Columbia. This work is performed by the District of Columbia Public Service Commission.

Emergency Planning Requirements

District of Columbia, Title 15, Chapters 23, Natural Gas, Sections 2308 address emergency planning requirements.

2308.1 Emergency Plans – Each natural gas corporation subject to the Commission's jurisdiction shall do the following:

(a) Establish an emergency plan to be implemented in the event of facility failures or other emergencies; (b) Acquaint appropriate maintenance and operating employees with the operation of the applicable portions of the plan; (c) Establish a liaison with appropriate public officials with respect to this plan; and (d) File with the Office of Engineering the name, address, and telephone number of employee(s) and official(s) of the has corporation who may be called in an emergency. It shall be the responsibility of each gas corporation to keep this information current.

Source:

District of Columbia Public Service Commission
1333 H Street NW, Suite 700 East Tower
Washington, DC 20005 Office: 202-626-9190;
Fax: 202-626-9174

Florida

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in the Florida.

Through certification by OPS, the state of Florida regulates, inspects, and enforces intrastate gas pipeline requirements. This work is performed by the Florida Public Service Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Florida Public Service Commission 2540 Shumard
Oak Boulevard Tallahassee, FL 32399-0850
Office: 850-413-6582

Georgia

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in the Georgia.

Through certification by OPS, the state of Georgia regulates, inspects, and enforces intrastate natural gas pipeline safety requirements. This work is performed by the Pipeline Safety Office of the Georgia Public Service Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Georgia Public Service Commission Pipeline Safety
Office 244 Washington St. SW Atlanta, GA 30334
Office: 404-463-6526; Fax: 404-463-6532

Hawaii

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Hawaii. There are no State regulations. PHMSA has oversight on all pipelines within the State.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Idaho

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Idaho.

Through certification by OPS, the state of Idaho regulates, inspects, and

enforces intrastate gas pipeline safety requirements. The Gas Pipeline Safety Division of the Idaho Public Utilities Commission performs this work.

Emergency Planning Requirements

IDAPA 31 Title 11, Chapter 01 31.11.01, Safety and Accident Reporting Rules for Utilities Regulated by Idaho Public Utilities Commission

The Commission incorporates by reference Part 260.9, Title 18 (April 1, 2010) and Parts 191, 192, 193, 195, and 199, Title 49, the Code of Federal Regulations (October 1, 2010), except that federal accident reporting requirements contained in the rules adopted by reference in Rule 201 are replaced for state reporting purposes by orders of the Commission or rules of the Commission.

Source:

Idaho Public Utility Commission
P.O. Box 83720 Boise, ID 83702-0074
Office: 208-334-0330; Fax: 208-334-3762

Illinois

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Illinois.

Through certification by OPS, the state of Illinois regulates, inspects, and enforces intrastate gas pipeline safety requirements. This work is performed by the Pipeline Safety Division of the Illinois Commerce Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Illinois Commerce Commission 527 East
Capitol Ave. Springfield, IL 62701 217-785-
1165; Fax: 217-524-5516

Indiana

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Indiana. This work is performed by the
Pipeline Safety Division of the Indiana Utility Regulatory Commission.

Emergency Planning Requirements

Pipeline Safety Division of the Indiana Utility Regulatory Commission enforces Indiana Code. Article 5, Gas Utilities. Section 5-3-2 adopts 49 CFR 192.605 and 49 CFR 195.402. This adoption by reference requires the operator to have a written emergency response plan that also includes gas emergency procedures.

Source:

Indiana Utility Regulatory Commission 101 West
Washington Street, Suite 1500 E Indianapolis, IN 46204
Office: 317-232-2717; Fax: 317-233-2410

Iowa

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Iowa. This work is performed by the Safety and Engineering Section of the Iowa Utilities Board.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Iowa Utilities Board 1375 E Court Ave, Rm 69 Des Moines, IA
50319-0069 Office: 515-725-7352; Fax: 515-725-7399

Kansas

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Kansas. This work is performed by the Pipeline Safety Division of the Kansas Commerce Commission.

Emergency Planning Requirements

Kansas maintains Pipeline Safety Regulations in supplement to federal requirements. Section 192.615 covers requirements for Emergency Plans. Gas pipeline operators must meet the following requirements:

(a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following: (1) Receiving, identifying, and classifying notices of events which require immediate response by the operator. (2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials. (3) Prompt and effective response to a notice of each type of emergency, including the following: (i) Gas detected inside or near a building.

(ii) Fire located near or directly involving a pipeline facility. (iii) Explosion occurring near or directly involving a pipeline facility. (iv) Natural disaster.
(4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency. (5) Actions directed toward protecting people first and then property. (6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.(7) Making safe any actual or potential hazard to life or property.

(8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency. (9) Safely restoring any service outage.
(10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible. (11) Actions required to be taken by a controller during an emergency in accordance with §192.631.

(b) Each operator shall: (1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures. (2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective. (3) Review employee activities to determine whether the procedures were effectively followed in each emergency. (c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to: (1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;

(2) Acquaint the official with the operator's ability in responding to a gas pipeline emergency; (3) Identify the types of gas pipeline emergencies of which the

operator notifies the officials; and (4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

Source:

Kansas Corporation Commission 1500 SW Arrowhead Road
Topeka, KS 66604 -4027 Office: 785-271-3278; Fax: 785-271-3357

Kentucky

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Kentucky. This work is performed by the Gas Branch of the Kentucky Public Service Commission.

Emergency Planning Requirements

Kentucky gas regulations under Section 13, Operations, require gas pipeline includes the following emergency planning requirements:

Section 13-9 (a) Each operator shall establish written procedures to minimize hazard resulting from a gas pipeline emergency. At a minimum, procedures shall provide for the following:

1. Receiving, identifying, and classifying notices of events which require immediate response by the operator.

2. Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.

3. Prompt and effective response to a notice of each type of emergency, including gas, fire, explosion or natural disaster near or involving a building with gas pipeline or pipeline facility.

4. Availability of personnel, equipment, tools, and materials, as needed at the scene of emergency.

5. Actions directed toward protecting people first and then property.

6. Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

7. Making safe any actual or potential hazard to life or property.

8. Notifying appropriate fire, police and other public officials of gas pipeline emergencies and coordinating with them, both planned responses and actual responses during an emergency.

9. Safely restoring any service outage.

10.Beginning action under subsection (10) of this section, if applicable, as soon after the end of the emergency as possible.

(b) Each operator shall:

1. Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of emergency procedures established under paragraph (a) of this subsection as necessary for compliance with those procedures.

2. Train appropriate operating personnel in emergency procedures and verify that training is effective.

3. Review employee activities to determine whether procedures were effectively followed in each emergency.

(c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

1. Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;
2. Acquaint officials with the operator's ability to respond to a gas pipeline emergency;
3. Identify types of gas pipeline emergencies of which the operator notifies officials; and
4. Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

(d) Each operator shall establish a continuing educational program to enable customers, the public, appropriate governmental organizations, and person engaged in excavation-related activities to recognize a gas pipeline emergency for the purpose of reporting it to the operator or appropriate public officials. The program and media used shall be as comprehensive as necessary to reach all areas in which the operator transports gas. The program shall be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(10) Investigation of failures. Each operator shall establish procedures for analyzing accidents and failure, including selection of samples of the failed facility or equipment for laboratory examination, where appropriate, to determine the causes of the failure and to minimize the possibility of recurrence.

Source: Kentucky Public Service Commission 211 Sower Boulevard P. O. Box 615 Frankfort, KY 40602-0615: 502-564-3940; Fax: 502-564-1582

Louisiana

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Louisiana. This work is performed by the Louisiana Department of Natural Resources.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Louisiana Department of Natural Resources
P.O. Box 94275 Baton Rouge, LA 70804-9275
Office: 225-342-9137; Fax: 225-342-5529

Maine

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Maine. This work is performed by the Maine Public Utilities Commission.

Emergency Planning Requirements

The Main Public Utility Commission enforces Maine 65-407. Chapter 420 addresses Safety Standards for Natural Gas and Liquefied Natural Gas Facility Operators. Section 7 requires that gas utility operators prepare a Pipeline Emergency Plan and allows the plan to be combined with the Operations and Maintenance Plan. All of the provisions of 49 VFR 192.605 and 192.615 (emergency plans) have been adopted by reference in the State Gas Code.

Source:

Maine Public Utilities Commission 242 State Street State House Station 18 Augusta, ME 04333-0018 Office: 207-287-1364; Fax: 207-287-1039

Maryland

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Maryland. This work is performed by the Pipeline Safety Division of the Maryland Public Service Commission.

Emergency Planning Requirements

The Maryland Public Utility Commission enforces Maryland Title 20, Subtitle 58, Safety Standards for Hazardous Liquid Pipelines. The State code adopts 49 CFR Part 191and 49 CFR Part 192 Transportation of Natural and Other Gas by Pipeline as minimal standards.

Source:

Public Service Commission of Maryland 6 St. Paul Street, 19th Floor Baltimore, MD 21202-6806 Office: 410-767-8111; Fax: 410-333-0884

Massachusetts

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration

(PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Massachusetts. This work is performed by the Pipeline Engineering/Safety Division of the Massachusetts Department of Telecommunications and Energy.

Emergency Planning Requirements

Massachusetts Title 220, Section 100.00, regulates natural gas pipelines and adopt CFR 49 Part 192 and 193. The State Gas Code requires LNG operators to cooperate with local police, fire, and civil defense departments and to provide training on emergency procedures.

Source:

Massachusetts Department of Public Utilities One South Station
Boston, MA 02110 Office: 617-305-3537; Fax: 617-478-2589

Michigan

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Michigan. This work is performed by the Gas Safety Office of the Michigan Public Service Commission.

Emergency Planning Requirements

Michigan State Rule 422 requires that gas pipeline operators meet the emergency planning requirements of 49 CFR Section 192.615.

Source: Michigan Public Service
Commission 6545 Mercantile Way

P.O. Box 30221 Lansing, MI 48909 Office: 517-241-6132;
Fax: 517-241-6121

Minnesota

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Minnesota. This work is performed by the Minnesota Office of Pipeline Safety, within the State Fire Marshal Division of the Minnesota Department of Public Safety.

Emergency Planning Requirements

Minnesota Regulation 299F.59 states:

Each person who engages in the transportation of gas or hazardous liquids or who owns or operates gas or hazardous liquid pipeline facilities shall:

(1) at all times after the date any applicable safety standard established under sections 299F.56 to 299F.641 takes effect comply with the requirements of such standard;

(2) file and comply with a plan for operation and maintenance required by sections 299F.56 to 299F.641;

(3) permit access to or copying of records, and make reports or provide information, and permit entry or inspection, as required by sections 299F.56 to 299F.641 and the standards adopted or orders issued under sections 299F.56 to 299F.641; and

(4) comply with sections 216D.01 to 216D.07, the one call excavation notice system.

299F.62 PLAN TO OPERATE AND MAINTAIN GAS PIPELINE.

(a) Each person who engages in the transportation of gas or who owns or operates gas pipeline facilities subject to sections 299F.56 to 299F.641 shall prepare, maintain, carry out, and file with the commissioner a plan for operation and maintenance of each such pipeline facility owned or operated by such person, and any changes in such plan, in accordance with the rules prescribed by the commissioner. On finding that such plan is inadequate to achieve safe operation, the commissioner shall, after notice and opportunity for a hearing, require such plan to be revised. The plan required by the commissioner shall be practicable and designed to meet the need for pipeline safety. (b) In determining the adequacy of any such plan, the commissioner shall consider the following:

1. Relevant available pipeline safety data;
2. Whether the plan is appropriate for the particular type of pipeline transportation;
3. The reasonableness of the plan; and

4. The extent to which such plan will contribute to public safety.

Source:

Minnesota Department of Public Safety / Office of Pipeline Safety 444
Cedar St., Suite 147-N, Town Square St. Paul, MN 55101-5147 Office:
651-201-7239; Fax: 651-296-9641

Mississippi

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Mississippi. This work is performed by Mississippi Public Service Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Mississippi Public Service Commission
501 N. West Street, Suite 201A Jackson,
MS 39201
P. O. Box 1174 Jackson, MS 39215-1174 Office:
601-961-5475; Fax: 601-961-5469

Missouri

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Missouri. This work is performed by the Gas Safety and Engineering Division of the Missouri Public Service Commission.

Emergency Planning Requirements

Missouri State Code 4, Part 240-40.030 (12) (j) (192.615) addresses emergency plans for pipelines. This section states:

J. 1. Beginning action under subsection (12)(L) (192.617), if applicable, as soon after the end of the emergency as possible.

1. Each operator shall— A. Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (12)(J)1. as necessary for compliance with those procedures; B. Train the appropriate operating personnel and conduct an annual review to assure that they are knowledgeable of the emergency procedures and verify that the training is effective; and C. Review employee activities to determine whether the procedures were effectively followed in each emergency.
2. Each operator shall establish and maintain liaison with appropriate fire, police and other public officials to—A. Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;

B. Acquaint the officials with the operator's ability in responding to a gas pipeline emergency; C. Identify the types of gas pipeline emergencies of which the operator notifies the officials; and D. Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

(12) Operations. (A) Scope. (192.601) This section prescribes minimum requirements for the operation of pipeline facilities.

(C) Procedural Manual for Operations, Maintenance, and Emergencies. (192.605)

1. General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response. For transmission lines that are not exempt under subparagraph (12)(C)3.E., the manual must also include procedures for handling abnormal operations. This manual must be reviewed and updated by the operator at intervals not exceeding fifteen (15) months, but at least once each calendar year. The manual must be revised, as necessary, within one (1) year of the effective date of revisions to this rule. This manual must be prepared before initial operations of a pipeline system commence and appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.

(J) Filing of Required Plans, Procedures and Programs. Each operator shall submit to designated commission personnel all plans, procedures and programs required by this rule (to include welding and joining procedures, construction standards, corrosion control procedures, damage prevention program,

emergency procedures, public education program, operator qualification program, replacement programs, transmission integrity management program, and procedural manual for operations, maintenance, and emergencies). In addition, each change must be submitted to designated commission personnel within twenty (20) days after the change is made.

(J) Emergency Plans. (192.615)

1. Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a mini-mum, the procedures must provide for the following: A. Receiving, identifying and classifying notices of events which require immediate response by the operator; B. Establishing and maintaining adequate means of communication with appropriate fire, police and other public officials; C. Responding promptly and effectively to a notice of each type of emergency, including the following: (I) Gas detected inside or near a building; (II) Fire located near or directly involving a pipeline facility; (III) Explosion occurring near or directly involving a pipeline facility; and (IV) Natural disaster; D. Making available personnel, equipment, tools and materials, as needed at the scene of an emergency; E. Taking actions directed toward protecting people first and then property; F. Causing an emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property; G. Making safe any actual or potential hazard to life or property; H. Notifying appropriate fire, police and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency; I. Safely restoring any service outage; and J. Beginning action under subsection (12)(L) (192.617), if applicable, as soon after the end of the emergency as possible. 2. Each operator shall— A. Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (12)(J)1. as necessary for compliance with those procedures; B. Train the appropriate operating personnel and conduct an annual review to assure that they are knowledgeable of the emergency procedures and verify that the training is effective; and C. Review employee activities to determine whether the procedures were effectively followed in each emergency. 3. Each operator shall establish and maintain liaison with appropriate fire, police and other public officials to— A. Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency; B. Acquaint the officials with the operator's ability in responding to a gas pipeline emergency; C. Identify the types of gas pipeline emergencies of which the operator notifies the officials; and D. Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

Source:

Missouri Public Service Commission
Governor Office Building, Suite 600
Jefferson City, MO 65101
P.O. Box 360 Jefferson City, MO 65102-0360 Office: 573-751-3456;
Fax: 573-522-1946

Montana

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Montana. The Gas Pipeline Safety Division of the Montana Public Utilities Commission performs this work.

Emergency Planning Requirements

Montana Code 38.5.2202 incorporates by reference federal pipeline regulations as follows:

(1) The commission adopts and incorporates by reference the U.S. Department of Transportation (DOT) Pipeline Safety Regulations, Code of Federal Regulations (CFR), Title 49, chapter 1, subchapter D, parts 191, 192, and 193, including all revisions and amendments enacted by DOT on or before September 30, 2011.

Source:

Montana Public Service Commission Department of
Public Service Regulation 1701 Prospect Avenue P
O Box 202601 Helena, MT 59620-2601 Office: 406-
444-6181; Fax: 406-444-7618

Nebraska

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Nebraska. This work is performed by

the Deputy State Fire Marshals of the Fuels Division in the Nebraska State Fire Marshals Office.

Emergency Planning Requirements

Nebraska State Code Title 155, Chapter-1 Regulations Pursuant to the Nebraska Natural Gas Pipeline Safety Act adopts 49 CFR Parts 191, 192, 193 and 199.

Source:

Nebraska State Fire Marshal 246 South 14th
Street Lincoln, NE 68508 Office: 402-471-9467;
Fax: 402-471-1024

Nevada

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Nevada. The Gas Pipeline Safety Division of the Nevada Public Utilities Commission performs this work.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Nevada Public Utilities Commission 1150
East William Street Carson City, NV 89701
Office: 775-684-6139; Fax: 775-684-6142

New Hampshire

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in New Hampshire. This work is performed by the Deputy State Fire Marshals of the Fuels Division in the Nebraska State Fire Marshals Office.

Emergency Planning Requirements

New Hampshire Administrative Rule Part 504, Section 504.07 addresses emergency plans and requires gas pipeline operators to prepare and emergency plan in compliance with 49 CFR 192.603 and 192.605, and 192.615.

Section 504(r) also requires the gas pipeline operator to develop a written security plan outlining actions necessary to protect the utility's facilities from breeches of security or sabotage, and outlining actions to be taken as required by Homeland Security Presidential Directive-3 and any subsequent modifications, pursuant to Public Law 107- 56, October 26, 2001.

Source:

New Hampshire Public Utilities Commission 21
S. Fruit Street, Suite 10 Concord, NH 03301-
2429 Office: 603-271-6026; Fax: 603-271-6048

New Jersey

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in New Jersey. This work is performed by the Bureau of Pipeline Safety within the New Jersey Board of Public Utilities.

Emergency Planning Requirements

New Jersey Administrative Code Title 14, Chapter 7 Section 14:7-1.2 states: A gas pipeline operator shall ensure that each pipeline is constructed, operated and maintained in compliance with this chapter, and with the Federal Code, which is incorporated herein by reference, or such other standard as the Board may from time to time prescribe.

Source:

New Jersey Board of Public Utilities Two Gateway Center
Newark, NJ 07102 Office: 973-648-4959; Fax: 973-693-6876

New Mexico

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in New Mexico. This work is performed by the Pipeline Safety Bureau in the Transportation Division of the New Mexico Public Regulation Commission.

Emergency Planning Requirements

New Mexico State Code 18.60.2.8 adopts by reference 49 CFR 190.5, 190.233(a) and (b), and 190.237, 49 CFR Part 192 and 49 CFR Part 195.

Source:

New Mexico Public Regulation Commission
Pipeline Safety Bureau
P. O. Box 1269 Santa Fe, NM 87504-1269
1120 Paseo de Peralta Santa Fe, NM
Office: 505-476-0253; Fax: 505-827-4388

New York

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in New York. This work is performed by the New York State Department of Public Service Office of Gas and Water.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

New York State Public Service Commission #3 Empire
State Plaza, 9th Floor Albany, NY 12223 Phone: (315) 428-
5154

North Carolina

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in North Carolina. This work is performed by the Pipeline Safety Section of the North Carolina Utility Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

North Carolina Utilities Commission 4325 Mail Service Center Raleigh, NC 27699-4325 430 North Salisbury Street Raleigh, NC 27603-5918 Phone: 919-733-8818; Fax: 919-733-7300

North Dakota

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in North Dakota. This work is performed by the Testing and Safety Division of the North Dakota Public Service Commission.

Emergency Planning Requirements

North Dakota State Code Chapter 49-02-01.2, Pipeline safety - Public Service Commission Jurisdiction - Hazardous Facility Orders.

1. The commission, by rule, may establish and enforce minimum safety standards for the design, construction, and operation of gas distribution facilities and intrastate pipeline facilities used for the distribution and intrastate transportation of gas, liquefied natural gas, or hazardous liquids, regardless of whether they are owned or operated by a public utility, in order to ensure the reasonable safety thereof. Any rule issued under this section affecting the design, installation, construction, initial inspection, and initial testing is not applicable to pipeline facilities in existence on the date such rule is adopted.

Such rules may not be more stringent than the corresponding federal regulations applicable to interstate pipelines and related facilities.

2. If the commission determines that a pipeline facility is hazardous to life or property, it may issue an order requiring the operator of the facility to take corrective action. The commission may issue such an order without notice and opportunity for hearing if the commission determines that to do otherwise would result in the likelihood of serious harm to life or property. The commission shall include in such an order an opportunity for hearing as soon as practicable after issuance of the order.

Source:

North Dakota Public Service Commission 12th Floor,
State Capitol Building – Department 408 Bismarck,
ND 58505 Office: 701-328-2413; Fax: 701-328-2410

Ohio

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Ohio. This work is performed by the Gas Pipeline Safety Section of the Public Utilities Commission of Ohio.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Ohio Public Utilities Commission 180 East Broad
Street, 6th Floor Columbus, Ohio 43215-3793
Office: 614-644-8983; Fax: 614-728-4319

Oklahoma

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Oklahoma. This work is performed by the Pipeline Safety Section, Gas Services Division of the Oklahoma Corporation Commission.

Emergency Planning Requirements

Oklahoma State Code Part-5, Minimum Safety Standards for Gas adopts 49 CFR Part 192 for intrastate pipelines.

Source:

Oklahoma Corporation Commission
P.O. Box 52000 Jim Thorpe Office Building
Oklahoma City, OK 73152-2000 Fax: 405-521-3455

Oregon

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Oregon. The Gas Pipeline Safety Division of the Oregon Public Utility Commission performs this work.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Oregon Public Utility Commission
P.O. Box 2148 Salem, OR 97308-2148
Office: 503-378-6760; Fax: 503-373-7752

Pennsylvania

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Pennsylvania. This work is performed by the Gas Safety Division of the Bureau of Transportation & Safety within the Pennsylvania Public Utilities Commission.

Emergency Planning Requirements

Pennsylvania State Code 59, Gas Services, Section 59.72, Natural Gas Emergency Planning includes the following requirements for emergency response to a gas pipeline leak:

☐ Issuance of periodic reports to the media concerning the existing natural gas emergency.

☐ Notice to affected customers and natural gas suppliers (NGSs) of the expected initiation of emergency actions under § 59.73.

☐ A procedure for focusing emergency measures to confined geographic or operational portions, segments or zones of the natural gas distribution company (NGDC) system where a natural gas emergency exists.

Source:

Pennsylvania Public Utility Commission
Commonwealth Keystone Building
P.O. Box 3265 Harrisburg, PA 17105-3265
Office: 717-787-1063; Fax: 717-787-3114

Rhode Island

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Rhode Island. This work is performed by the Gas Safety Division of the Rhode Island Division Public Utilities Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Rhode Island Division Public Utilities Commission 89
Jefferson Blvd Warwick, RI 02888-1046 Office: 401-780-
2123; Fax: 401-941-4885

South Carolina

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in South Carolina. This work is performed by the Pipeline Safety office of the South Carolina Public Service Commission.

Emergency Planning Requirements

South Carolina State Code, Article 4. Chapter 103-412, Section 2.6 states:

2.6. All gas systems subject to pipeline safety regulation shall file with the commission and provide to the Office of Regulatory Staff (ORS) those reports, policies and procedures required by the Federal Pipeline Safety Regulations: Minimum Safety Standards for the Transportation of Natural Gas and Other Gas, 49 C.F.R., as amended from time to time, to include, but not limited to, the following: a. Inspection; and maintenance manual; b. Emergency plan.

Source:

Office of Regulatory Staff of South Carolina
P.O. Drawer 11263 Columbia, SC 29201 1441
Main Street, Suite 300 Columbia, SC 29211
Office: 803-737-0800; Fax: 803-737-0986

South Dakota

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in South Dakota. This work is performed by the Pipeline Safety Division of the South Dakota Public Utilities Commission.

Emergency Planning Requirements

South Dakota State Code, Chapter 49-34B, Section 4 states that the Commission may, by rules promulgated pursuant to chapter 1-26, establish safety standards, but not more stringent than federal safety standards as provided by § 49-34B-3, for the intrastate transportation of gas and gas pipeline facilities. The standards may apply to the design, installation, inspection, testing, construction, extension, operation, replacement, and maintenance of gas pipeline facilities. Standards affecting the design, installation, construction, initial inspection, and initial testing do not apply to pipeline facilities in existence on the date the standards are adopted by either this state or the federal government. The safety standards shall be practicable and designed to meet the need for pipeline safety. In prescribing the standards, the commission shall consider: 1) Relevant applicable data; 2) Whether the standards are appropriate for the particular type of pipeline transportation of gas; 3) The reasonableness of any proposed standards; 4)The extent to which the standard will contribute to public safety; and 5) The existing standards established by the secretary of the United States Department of Transportation pursuant to the United States Code, title 49, section 60101 et seq. as amended to January 12, 2012.

Source:

South Dakota Public Utilities Commission 500 East Capitol Avenue Pierre, SD 57501-5070 Office: 605-773-4210; Fax: 866-757-6031

Tennessee

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Tennessee. This work is performed by Gas Pipeline Safety Division of the Tennessee Regulatory Authority.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Tennessee Regulatory Authority 460 James
Robertson Parkway Nashville, TN 37243-0505 Office:
800-342-8359; Fax: 615-741-1228

Texas

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Texas. This work is performed by the Pipeline Safety Section, Gas Services Division of the Texas Railroad Commission.

Emergency Planning Requirements

Texas Administrative Code, Title 16, Part-1, Chapter 8, Subchapter D, Requirements for Hazardous Liquids and Carbon Dioxide Only, Rule 8.315 states:

For Hazardous Liquids and Carbon Dioxide Pipelines or Pipeline Facilities Located Within 1,000 Feet of a Public School Building or Facility, the following applies:

(a) In addition to the requirements of §8.310 of this title (relating to Hazardous Liquids and Carbon Dioxide Pipelines Public Education and Liaison), each owner or operator of each intrastate hazardous liquids pipeline or pipeline facility and each intrastate carbon dioxide pipeline or pipeline facility shall comply with this section.

b) This section applies to each owner or operator of a hazardous liquid or carbon dioxide pipeline or pipeline facility any part of which is located within 1,000 feet of a public school building containing classrooms, or within 1,000 feet of any other public school facility where students congregate.

(c) Each pipeline owner and operator to which this section applies shall, for each pipeline or pipeline facility any part of which is located within 1,000 feet of a

public school building containing classrooms, or within 1,000 feet of any other public school facility where students congregate, file with the Division, no later than January 15 of every odd numbered year, the following information:

1) the name of the school; 2) the street address of the public school building or other public school facility; and 3) the identification (system name) of the pipeline.

(d) Each pipeline owner and operator to which this section applies shall: 1) upon written request from a school district, provide in writing the following parts of a pipeline emergency response plan that are relevant to the school: A) a description and map of the pipeline facilities that are within 1,000 feet of the school building or facility; B) a list of any product transported in the segment of the pipeline that is within 1,000 feet of the school facility; C) the designated emergency number for the pipeline facility operator; D) information on the state's excavation one-call system; and E) information on how to recognize, report, and respond to a product release.

Source:

Railroad Commission of Texas Capitol Station, P.O. Box 12967
Austin, TX 78711-2967 Office: 512-463-7008; Fax: 512-463-7153

Utah

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Utah. The Gas Pipeline Safety
Division of the Utah Public Utilities Commission performs this work.

Emergency Planning Requirements

Utah State Code, Title 54, Chapter 13, Natural Gas Pipeline Safety, Section 5413-2 states:

The commission is responsible for establishing safety standards and practices for intrastate pipeline transportation and shall make and enforce rules required by the federal Natural Gas Pipeline Safety Act to maintain state control over the regulation of intrastate pipeline transportation.

Rule R746-409. Pipeline Safety A, Scope and Applicability -- To enable the Commission to carry out its duties regarding pipeline safety under Chapter 13,

Title 54, the following rules shall apply to persons owning or operating an intrastate pipeline facility as defined in that chapter, or a segment of that chapter including, but not limited to, master meter systems, as well as persons engaged in the transportation of gas.

B. Adoption of Parts 190, 191, 192, 198, and 199 -- The Commission hereby adopts, and incorporates by this reference, CFR Title 49, Parts 190, 191, 192, 198, and 199, as amended, October 1, 2010. Persons owning or operating an intrastate pipeline facility in Utah, or a segment thereof, as well as persons engaged in the transportation of gas, shall comply with the minimum safety standards specified in those Parts of CFR Title 49.

Source:

Utah Department of Commerce Heber M. Wells Building, 4th Floor 160 East 300 South, SM Box 146751 Salt Lake City, UT 84144-6751 Office: 801-530-6673; Fax: 801-530-6512

Vermont

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Vermont. This work is performed through the Director of Engineering within the Vermont Department of Public Service.

Emergency Planning Requirements

Vermont State Code 6.100 Enforcement of Safety Regulations Pertaining to Intrastate Gas Pipeline and Transportation Facilities states:

6.160 Accidents and Emergencies. Accidents occurring on gas transmission or distribution systems and facilities and causing in-patient hospitalization or death to any person or persons, or damage to property in excess of $5,000, shall be reported immediately to the Board and Department of Public Service by telephone or other means of prompt notification.

Every Gas Corporation operating a gas transmission or distribution system in the State of Vermont shall file with the Department of Public Service and the Board and with every municipality within which the gas transmission distribution system is located, the names, addresses and telephone numbers of two responsible

officials of such gas corporations who may be contacted in the event of an emergency.

Source:

Vermont Department of Public Service 112 State Street, Suite 200 Montpelier, VT 05620-2601 Telephone: 802-828-2811 Office: 802-828-4007; Fax: 802-828-2342

Virginia

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Virginia. This work is performed by the Division of Utility and Railroad Safety of the Virginia State Corporation Commission.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Virginia State Corporation Commission Tyler Building, P.O. Box 1197 Richmond, VA 23218-1197 Office: 804-371-9264; Fax: 804-371-9734

Washington

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Washington. The Washington Utilities and Transportation Commission perform this work.

Emergency Planning Requirements

Washington State Code 480-93-180, regarding plans and procedures states:

(1) Each gas pipeline company must have and follow a gas pipeline plan and procedure manual (manual) for operation, maintenance, inspection, and emergency response activities that is specific to the gas pipeline company's system. The manual must include plans and procedures for meeting all applicable requirements of 49 C.F.R. §§ 191, 192 and chapter 480-93 WAC, and any plans or procedures used by a gas pipeline company's associated contractors.

(2) The manual must be filed with the commission forty-five days prior to the operation of any gas pipeline. Each gas pipeline company must file revisions to the manual with the commission annually. The commission may, after notice and opportunity for hearing, require that a manual be revised or amended. Applicable portions of the manual related to a procedure being performed on the pipeline must be retained on-site where the activity is being performed.

(3) The manual must be written in detail sufficient for a person with adequate training to perform the tasks described. For example, a manual should contain specific, detailed, step-by-step instructions on how to maintain a regulator or rectifier, conduct a leak survey or conduct a pressure test.

Source:

Washington Utilities and Transportation Commission
1300 S. Evergreen Park Dr, SW
P.O. Box 47250 Olympia, WA 98504-7250
Office: 360-664-1219; Fax: 360-586-1172

West Virginia

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in West Virginia. The West Virginia Public Service Commission performs this work.

Emergency Planning Requirements

West Virginia Legislative Rule, Title 150, Series 4, Section 9.3 and 11,5 states:

9.3.1. The regulations promulgated by the Office of Pipeline Safety of the United

States Department of Transportation, published in Title 49 CFR Parts 191, 192, 195 and 199, shall apply to all pipeline companies and interstate transmission facilities.

11.5. Inspection Intervals. Upon presentation of appropriate credentials, the Commission or its designated employee is authorized to enter upon, inspect and examine, at reasonable times and in a reasonable manner, the records and properties of persons to the extent such records and properties are relevant to determining the compliance of such persons with the rules and regulations or Commission orders issued thereunder.

A review of the operator's operating, maintenance and emergency procedures will be conducted at intervals not to exceed 18 months under normal circumstances. Master meter inspections will be performed at 2 ½ year intervals under normal circumstances. However, this does not preclude inspections and/or reviews of the procedures more frequently as deemed necessary.

Source:

West Virginia Public Service Commission

P.O. Box 812 Charleston, WV 25323 201 Brooks Street Charleston, WV 25301 Office: 304-340-0393; Fax: 304-340-3755

Wisconsin

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Wisconsin. This work is performed by the Pipeline Safety Program within the Natural Gas Division of the Wisconsin Public Service Commission.

Emergency Planning Requirements

Wisconsin Public Safety Code, Chapter 135, Gas Safety, Section 135.09 states:

(1) The federal department of transportation, office of pipeline safety, pipeline safety standards, as adopted through July 1, 2007, and incorporated in 49 CFR Parts 192, 193 and 199, including the appendices, are adopted as state pipeline safety standards and incorporated by reference into this chapter.

(2) State additions to the federal pipeline safety standards are shown in subchapter II.

(3) Pursuant to s. 227.21, Stats., the attorney general and the legislative reference bureau have consented to the incorporation by reference of the provisions in 49 CFR Parts 192, 193 and 199, including the appendices. Copies are on file at the office of the public service commission, the secretary of state, and the legislative reference bureau.

(4) All gas public utilities and gas pipeline operators shall file with the public service commission a copy of the manual of written procedures for conducting operations and maintenance activities and for emergency response required under 49 CFR 192.605(a). Each change in the manual shall be filed with the commission within 20 days after the change is made.

Source:

Wisconsin Public Service Commission
610 North Whitney Way Madison, WI
53705
P.O. Box 7854 Madison, WI 53707 Office: 608-266-2800; Fax: 609-266-3957

Wyoming

The Office of Pipeline Safety (OPS), within the U. S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates and inspects interstate gas pipelines as well as hazardous liquid intrastate and interstate operators in Wyoming. The Gas Pipeline Safety Division of the Wyoming Public Utilities Commission performs this work.

Emergency Planning Requirements

There are no specific state emergency planning requirements beyond those already required under federal pipeline regulations.

Source:

Wyoming Public Service Commission 2515 Warren Avenue, Suite 300 Cheyenne, WY 82002-0230 Office: 307-777-5750; Fax: 307-777-5700

Appendix A
Acronym
List

The following acronyms appear in this report and are placed in order of appearance.

CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
PHMSA	Pipeline and Hazardous Materials Administration
U.S.	United States
OPM	Office of Pipeline Safety
U.S.C.	United States Code
OCS	Outer Continental Shelf
LNG	Liquefied natural gas
LHG	Liquefied hazardous gas
COTP	Captain of the Port
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ACP	Area Contingency Plan
PREP	National Preparedness for Response Exercise Program
OPS	Office of Pipeline Safety
EPA	Environmental Protection Agency
MMS	Minerals Management Service
USCG	United States Coast Guard
OSRO	Oil Spill Response Organizations
MTR	Marine transportation-related
EDAC	Effective daily application capacity
FWPCA	Federal Water Pollution Control Act
FERC	Federal Energy Regulatory Commission
NGA	Natural Gas Act of 1938
FWS	Fish and Wildlife Service
NWRS	National Wildlife Refuge System
BLM	Bureau of Land Management
NPS	National Park Service
BIA	Bureau of Indian Affairs
FS	Forest Service
COE	Army Corps of Engineers
CWA	Clean Water Act
CAA	Clean Air Act
NOAA	National Oceanic and Atmospheric Administration
TERA	Tribal Energy Resource Agreement
CERT	Council of Energy Resource Tribes
PUC	Public Utilities Commission
NGS	Natural Gas Supplier
NGDC	Natural Gas Distribution Company
ORS	Office of Regulatory Staff of South Caroline

Appendix-B Alphabetical Listing of Pipeline Incidents and Their Impact By State For 2001 to 2011

State	Significant Incidents	Incidents w/fatalities	No. of Fatalities	Incidents w/Injury	No. of Injuries	Property Damage	Total Pipeline Mileage
Alabama	**41**	**3**	**5**	**8**	**8**	**$12,307,491**	**38,539**
Alaska	**20**	**0**	**0**	**3**	**3**	**$56,901,888**	**4,790**
Arizona	**36**	**1**	**1**	**7**	**12**	**$23,658,636**	**31,047**
Arkansas	**38**	**2**	**4**	**7**	**7**	**$9,863,285**	**29,512**
California	**195**	**6**	**17**	**20**	**73**	**$505,292,870**	**122,406**
Colorado	**48**	**1**	**1**	**9**	**16**	**$23,054,573**	**47,160**
Connecticut	**13**	**1**	**2**	**5**	**11**	**$23,054,573**	**8,321**
Delaware	**3**	**0**	**0**	**1**	**3**	**$1,174,717**	**3,168**
D.C.	**2**	**0**	**0**	**1**	**1**	**$223,200**	**1,213**
Florida	**25**	**1**	**1**	**6**	**8**	**$14,096,403**	**31,680**
Georgia	**47**	**4**	**4**	**11**	**13**	**$38,977,927**	**49,548**
Hawaii	**5**	**0**	**0**	**0**	**0**	**$1,414,751**	**729**
Idaho	**12**	**1**	**1**	**1**	**2**	**$3,212,618**	**10,116**
Illinois	**149**	**4**	**5**	**28**	**44**	**$128,252,703**	**77,854**

State	Significant Incidents	Incidents w/fatalities	No. of Fatalities	Incidents w/Injury	No. of Injuries	Property Damage	Total Pipeline Mileage
Massachusetts	22	3	4	6	7	$8,248,231	22,284
Michigan	72	5	6	14	21	$772,128,692	68,775
Minnesota	65	2	5	8	10	$40,605,927	26,573
Mississippi.	50	4	5	9	16	$15,295,966	28,495
Missouri	49	1	1	5	7	$19,175,119	36,703
Montana	22	2	2	5	5	$145,519,464	13,283
Nebraska	32	2	3	7	10	$11,572,639	21,049
Nevada	11	1	1	3	4	$6,388,065	11,542
New Hampshire	1	0	0	0	0	$603,484	2,190
New Jersey	40	1	1	6	11	$17,590,840	35,451
New Mexico	60	3	3	14	18	$6,011,540	26,638
New York	58	7	8	15	26	$37,414,538	53,343
North Carolina	28	1	1	6	7	$12,320,610	33,409
North Dakota	24	1	1	1	4	$12,377,539	7,951
Ohio	89	7	8	11	24	$66,176,367	71,071
Oklahoma	142	3	3	6	6	$55,094,498	51,721
Oregon	10	1	3	4	6	$2,449,898	18,962
Pennsylvania	118	10	16	25	38	$66,049,641	60,338
Rhode Island	4	0	0	2	4	$362,819	3,239
South Carolina	7	0	0	2	5	$2,558,858	22,188
South Dakota	7	0	0	0	0	$1,975,531	6,883
Tennessee.	19	0	0	11	13	$86,559,400	42,473
Texas	588	15	16	46	69	$382,679,941	219,492
Utah	26	1	2	5	7	$56,434,919	22,164
Vermont	1	0	0	0	0	$210,512	867

State	Significant Incidents	Incidents w/fatalities	No. of Fatalities	Incidents w/Injury	No. of Injuries	Property Damage	Total Pipeline Mileage
Virginia	**33**	**2**	**2**	**6**	**15**	**$29,600,815**	**24,655**
Washington	**22**	**1**	**1**	**5**	**7**	**$4,783,220**	**24,370**
West Virginia	**20**	**1**	**4**	**7**	**8**	**$11,258,244**	**15,135**
Wisconsin	**34**	**3**	**4**	**5**	**10**	**$31,871,572**	**44,430**
Wyoming	**45**	**2**	**3**	**2**	**5**	**$17,246,649**	**17,493**

Total of 1,721,163 miles Total Property

Damage $4,132,663,595.00

Appendix – C State Pipeline Enforcement Agencies

Pipeline safety programs are overseen by Congress and administered by the Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). Operating through the Office of Pipeline Safety (OPS), PHMSA delegates the majority of these responsibilities for intrastate lines to the states. Under current law the states opt into this relationship with PHMSA. At present, only Alaska and Hawaii have opted out of this relationship. In these two states -Alaska and Hawaii – OPS inspects, regulations and enforces interstate ***and*** intrastate gas and liquid pipeline safety requirements.

State	Enforcing Agency
Alabama (AL)	Alabama Public Service Commission P. O. Box 304260 Montgomery, AL 36130-4260, Office: 334-242-5780; Fax: 334-242-0687
Arizona (AZ)	Arizona Corporation Commission 2200 N. Central Ave., Suite 300 Phoenix, Arizona 85004 Office: 602-262-5601 ;Fax: 602-262-5620
Arkansas (AR)	Arkansas Oil and Gas Commission 2215 West Hillsboro (P. O. Box 1472) El Dorado, AR 71731 Phone: 870-862-4965; Fax: 870-862-8823
California (CA)	Office of California State Fire Marshal (*Oversees hazardous liquids pipelines) Pipeline Safety Division 3950 Paramount Blvd, #210 Lakewood, CA 90712 Fax: 562-497-9104

State	Enforcing Agency
California (CA)	California Public Utilities Commission (*Oversees Gas pipelines) 320 West 4th Street, Suite 500 Los Angeles, CA 90013 Office: 213-576-7019; Fax: 213-576-7013
Colorado (CO)	Colorado Public Utilities Commission 1560 Broadway, Suite 250 Denver, CO 80202 Office: 303-894-2851; Fax: 303-894-2065
Connecticut (CT)	Connecticut Department of Public Utility Control 10 Franklin Square New Britain, CT 06051 Office: 860-827-2661; Fax: 860-827-2613
Delaware (DE)	Delaware Public Service Commission 861 Silver Lake Boulevard, Cannon Bldg, Suite 100 Dover, DE 19904 Office: 302-736-7526; Fax: 302-739-5258; Cell: 302-538-0781
District of Columbia (DC)	District of Columbia Public Service Commission 1333 H Street NW, Suite 700 East Tower Washington, DC 20005 Office: 202-626-9190; Fax: 202-626-9174
Florida (FL)	Florida Public Service Commission 2540 Shumard Oak Boulevard Tallahassee, FL 32399-0850 Office: 850-413-6582

State	Enforcing Agency
Georgia (GA)	Georgia Public Service Commission Pipeline Safety Office 244 Washington St. SW Atlanta, GA 30334 Office: 404-463-6526; Fax: 404-463-6532
Idaho (ID)	Idaho Public Utility Commission P.O. Box 83720 Boise, ID 83702-0074 Office: 208-334-0330; Fax: 208-334-3762
Illinois (IL)	Illinois Commerce Commission 527 East Capitol Ave. Springfield, IL 62701 Office: 217-785-1165; Fax: 217-524-5516
Indiana (IN)	Indiana Utility Regulatory Commission 101 West Washington Street, Suite 1500 E Indianapolis, IN 46204 Office: 317-232-2717; Fax: 317-233-2410
Iowa (IA)	Iowa Utilities Board 1375 E Court Ave, Rm 69 Des Moines, IA 50319-0069 Office: 515-725-7352; Fax: 515-725-7399
Kansas (KS)	Kansas Corporation Commission 1500 SW Arrowhead Road Topeka, KS 66604-4027 Office: 785-271-3278; Fax: 785-271-3357

State	Enforcing Agency
Kentucky (KY)	Kentucky Public Service Commission 211 Sower Boulevard P. O. Box 615 Frankfort, KY 40602-0615 Office: 502-564-3940; Fax: 502-564-1582
Louisiana (LA)	Louisiana Department of Natural Resources P.O. Box 94275 Baton Rouge, LA 70804-9275 Office: 225-342-9137; Fax: 225-342-5529
Maine (ME)	Maine Public Utilities Commission 242 State Street State House Station 18 Augusta, ME 04333-0018 Office: 207-287-1364; Fax: 207-287-1039
Maryland (MD)	Public Service Commission of Maryland 6 St. Paul Street, 19th Floor Baltimore, MD 21202-6806 Office: 410-767-8111; Fax: 410-333-0884
Massachusetts (MA)	Massachusetts Department of Public Utilities One South Station Boston, MA 02110 Office: 617-305-3537; Fax: 617-478-2589

State	Enforcing Agency
Michigan (MI)	Michigan Public Service Commission 6545 Mercantile Way P.O. Box 30221 Lansing, MI 48909 Office: 517-241-6132; Fax: 517-241-6121
Minnesota (MN)	Minnesota Department of Public Safety / Office of Pipeline Safety 444 Cedar St., Suite 147-N, Town Square St. Paul, MN 55101-5147 Office: 651-201-7239; Fax: 651-296-9641
Mississippi (MS)	Mississippi Public Service Commission 501 N. West Street, Suite 201A Jackson, MS 39201 P. O. Box 1174 Jackson, MS 39215-1174 Office: 601-961-5475; Fax: 601-961-5469
Missouri (MO)	Missouri Public Service Commission Governor Office Building, Suite 600 Jefferson City, MO 65101 P.O. Box 360 Jefferson City, MO 65102-0360 Office: 573-751-3456; Fax: 573-522-1946
Montana (MT)	Montana Public Service Commission Department of Public Service Regulation 1701 Prospect Avenue P O Box 202601 Helena, MT 59620-2601 Office: 406-444-6181; Fax: 406-444-7618

State	Enforcing Agency
Nebraska (NE)	Nebraska State Fire Marshal 246 South 14th Street Lincoln, NE 68508 Office: 402-471-9467; Fax: 402-471-1024
Nevada (NV)	Nevada Public Utilities Commission 1150 East William Street Carson City, NV 89701 Office: 775-684-6139; Fax: 775-684-6142
New Hampshire (NH)	New Hampshire Public Utilities Commission 21 S. Fruit Street, Suite 10 Concord, NH 03301-2429 Office: 603-271-6026; Fax: 603-271-6048
New Jersey (NJ)	New Jersey Board of Public Utilities Two Gateway Center Newark, NJ 07102 Office: 973-648-4959; Fax: 973-693-6876
New Mexico (NM)	New Mexico Public Regulation Commission Pipeline Safety Bureau P. O. Box 1269 Santa Fe, NM 87504-1269 1120 Paseo de Peralta Santa Fe, NM 87501 Office: 505-476-0253; Fax: 505-827-4388
New York (NY)	New York State Public Service Commission #3 Empire State Plaza, 9th Floor Albany, NY 12223 Phone: (315) 428-5154

State	Enforcing Agency
North Carolina (NC)	North Carolina Utilities Commission 4325 Mail Service Center Raleigh, NC 27699-4325 430 North Salisbury Street Raleigh, NC 27603-5918 Phone: 919-733-8818; Fax: 919-733-7300
North Dakota (ND)	North Dakota Public Service Commission 12th Floor, State Capitol Building – Department 408 Bismarck, ND 58505 Office: 701-328-2413; Fax: 701-328-2410
Ohio (OH)	Ohio Public Utilities Commission 180 East Broad Street, 6th Floor Columbus, Ohio 43215-3793 Office: 614-644-8983; Fax: 614-728-4319
Oklahoma (OK)	Oklahoma Corporation Commission P.O. Box 52000 Jim Thorpe Office Building Oklahoma City, OK 73152-2000 Direct: 405-521-2258; Fax: 405-521-3455
Oregon (OR)	Oregon Public Utility Commission P.O. Box 2148 Salem, OR 97308-2148 Office: 503-378-6760; Fax: 503-373-7752

State	Enforcing Agency
Pennsylvania (PA)	Pennsylvania Public Utility Commission Commonwealth Keystone Building P.O. Box 3265 Harrisburg, PA 17105-3265 Office: 717-787-1063; Fax: 717-787-3114
Rhode Island (RI)	Rhode Island Division Public Utilities Commission 89 Jefferson Blvd Warwick, RI 02888-1046 Office: 401-780-2123; Fax: 401-941-4885
South Carolina (SC)	Office of Regulatory Staff of South Carolina P.O. Drawer 11263 Columbia, SC 29201 1441 Main Street, Suite 300 Columbia, SC 29211 Office: 803-737-0800; Fax: 803-737-0986
South Dakota (SD)	South Dakota Public Utilities Commission 500 East Capitol Avenue Pierre, SD 57501-5070 Office: 605-773-4210; Fax: 866-757-6031
Tennessee (TN)	Tennessee Regulatory Authority 460 James Robertson Parkway Nashville, TN 37243-0505 Office: 800-342-8359; Fax: 615-741-1228

State	Enforcing Agency
Texas (TX)	Railroad Commission of Texas Capitol Station, P.O. Box 12967 Austin, TX 78711-2967 Office: 512-463-7008; Fax: 512-463-7153
Utah (UT)	Utah Department of Commerce Heber M. Wells Building, 4th Floor 160 East 300 South, SM Box 146751 Salt Lake City, UT 84144-6751 Office: 801-530-6673; Fax: 801-530-6512
Vermont (VT)	Vermont Department of Public Service 112 State Street, Suite 200 Montpelier, VT 05620-2601 Telephone: 802-828-2811 Office: 802-828-4007; Fax: 802-828-2342
Virginia (VA)	Virginia State Corporation Commission Tyler Building, P.O. Box 1197 Richmond, VA 23218-1197 Office: 804-371-9264; Fax: 804-371-9734
Washington (WA)	Washington Utilities and Transportation Commission 1300 S. Evergreen Park Dr, SW P.O. Box 47250 Olympia, WA 98504-7250 Office: 360-664-1219; Fax: 360-586-1172

State	Enforcing Agency
West Virginia (WV)	West Virginia Public Service Commission P.O. Box 812 Charleston, WV 25323 201 Brooks Street Charleston, WV 25301 Office: 304-340-0393; Fax: 304-340-3755
Wisconsin (WI)	Wisconsin Public Service Commission 610 North Whitney Way Madison, WI 53705 P.O. Box 7854 Madison, WI 53707 Office: 608-266-2800; Fax: 609-266-3957
Wyoming (WY)	Wyoming Public Service Commission 2515 Warren Avenue, Suite 300 Cheyenne, WY 82002-0230 Office: 307-777-5750; Fax: 307-777-5700

Appendix-D States With Enhanced Pipeline Regulations

States may adopt pipeline safety regulations that are stricter than federal regulations. This chart identifies those states and delineates their status with regard to enhanced emergency planning or reporting requirements:

State	Enhanced Reporting Requirement
Alabama	Requires annual filing of emergency plans and updates within 10 days with Commission.
Arizona	Operators must file Operations and Maintenance plan including an emergency plan with the Arizona Corporation Commission 30 days prior to placing a pipeline into operation and changes are to be filed within 30 days of effective date of change.
Arkansas	Requires each operator to establish written procedures to minimize the hazard resulting from a gas pipeline emergency.
California	Every pipeline operator shall provide to the fire department having fire suppression responsibilities a map or suitable diagram showing the location of the pipeline, a description of all products transported within the pipeline, and a contingency plan for pipeline emergencies which shall include, but not be limited to any reasonable information which the State Fire Marshal may require. Every pipeline operator shall offer to meet with the local fire department having fire suppression responsibilities at least once each calendar year to discuss and review contingency plans for pipeline emergencies. The State Fire Marshal shall develop a comprehensive database of pipeline information that can be utilized for emergency response and program operational purposes.

State	Enhanced Reporting Requirement
Connecticut	Emergency plans must be filed with the Public Utilities Regulatory Authority (PURA), Department of Emergency Management and Homeland Security and each municipality located within the service area of the public service company.
District of Columbia	Requires providing contact list for emergencies with the Public Service Commission.
Indiana	Emergency response procedures required to be sent to the Pipeline Safety Division.
Kansas	Requires annual filing of emergency plans with the Kansas Corporation Commission.
Kentucky	Requires each operator to establish written procedures to minimize hazard resulting from a gas pipeline emergency. Requires the operator to establish and maintain adequate means of communication with appropriate fire, police, and other public officials. Requires a prompt and effective response to a notice of each type of emergency, including gas, fire, explosion or natural disaster near or involving a building with gas pipeline or pipeline facility. Requires operator to notify appropriate fire, police and other public officials of gas pipeline emergencies and coordinating with them, both planned responses and actual responses during an emergency.

State	Enhanced Reporting Requirement
Maine	Requires annual filing of emergency plans with the Public Utilities Commission. Requires operator qualification plans be integrated with O&M and emergency plan.
Minnesota	Emergency Response Plans must be filed/approved with MN Office of Pipeline Safety (MNOPS); Provide contact list for emergencies to Safety Inspectors.
Missouri	Requires each operator to establish and maintain liaison with appropriate fire, police and other public officials to— A. Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency; B. Acquaint the officials with the operator's ability in responding to a gas pipeline emergency; C. Identify the types of gas pipeline emergencies of which the operator notifies the officials; and D. Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.
New Hampshire	Requires annual filing of emergency plans with the Public Utilities Commission.
New Jersey	Requires emergency response plans to be filed for transmission lines.
South Carolina	Requires annual filing of emergency plans with the Office of Regulatory Staff (ORS).

State	Enhanced Reporting Requirement
Texas	Requires operators of Hazardous Liquids and Carbon Dioxide Pipelines located within 1,000 feet of a public school building containing classrooms, or within 1,000 feet of any other public school facility where students congregate to notify the respective school districts every other year that their schools are within close proximity of the pipeline. Each pipeline owner and operator: 1) upon written request from a school district, must provide in writing the following parts of a pipeline emergency response plan that are relevant to the school: A) a description and map of the pipeline facilities that are within 1,000 feet of the school building or facility; B) a list of any product transported in the segment of the pipeline that is within 1,000 feet of the school facility; C) the designated emergency number for the pipeline facility operator; D) information on the state's excavation one-call system; and E) information on how to recognize, report, and respond to a product release.
Vermont	All emergency contacts shall be filed with the Department of Public Service (DPS) and the Vermont Public Service Board.
Washington	Requires new pipeline companies to file O&M procedure manuals and emergency response plans at least 45 days prior to operating any pipeline. Revisions to manuals must be filed annually.
Wisconsin	All gas public utilities and gas pipeline operators shall file with the public service commission a copy of emergency response required under 49 CFR 192.605(a). Each change in the manual shall be filed with the commission within 20 days after the change is made.

DRAFT REPORT

HMCRP HM-15

Appendix 3: Review and Summary of Voluntary Consensus Standards for Best Practices Related To Communicating Emergency Response Plans and Their Effectiveness

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Overview of Task

This report is a document prepared in support of the research project's objective of preparing a *Guide for Communication of Emergency Response Information for Natural Gas and Liquid Pipelines*.

This report is supplemented with two appendix sections:

Appendix-A: This appendix lists key acronyms in the order that they appear in the report.

Appendix-B: This appendix summarizes the principal elements in American Petroleum Institute (API) Recommended Practice RP 1162, *Public Awareness Programs for Pipeline Operators*.

The following provides an overview of consensus standards organizations that currently have standards, recommended practices, or best practices that are related to communicating emergency response plans to public officials or emergency response agencies.

American Petroleum Institute

The American Petroleum Institute (API) is the national trade association for the petroleum industry. API is the primary developer of consensus standards, recommended practices, and guidelines for the U.S. petroleum industry. API standards cover a wide range of topics, including oil production, refining, pipelines, marketing terminals, safety, and fire protection.

API has a committee structure that is open to companies that own and operate crude oil and petroleum product pipelines. It provides a forum for the development of pipeline industry standards, sharing of technical and operational information, and conducting of applied research programs. API standards are often cited as the basis for design and construction standards of storage tanks, valves, and other operational issues. Additional information on API can be found at www.api.org.

RP 1162, Public Awareness Programs for Pipeline Operators

API's Recommended Practice, RP-1162, is a voluntary guideline developed through the API and American National Standards Institute (ANSI) standards-making process to assist U.S. pipeline operators in improving public awareness of pipelines and developing and managing effective public awareness programs. RP-1162 applies to operators of both liquid and gas pipelines and is a resource

that pipeline operators can use to assist with public awareness activities along existing pipeline routes. In developing this guideline, API collaborated with federal and state regulators and representatives of natural gas and liquid transmission companies and local distribution companies.

Under the federal Pipeline Safety Improvement Act of 2002 (Section 5), the Federal Office of Pipeline Safety has been directed to develop regulations to improve the public education programs of pipeline operators. This includes requiring pipeline operators to review their existing public education programs for effectiveness, modify the programs as appropriate, and submit their programs to OPS or the appropriate state pipeline agency for review. RP-1162 is specifically designed to help pipeline companies meet this regulation.

RP 1162 is referenced in 49 CFR Parts 192 and 195. There are three principal compliance elements in 49 CFR Parts 192 and 195 related to API 1162. For more details on how RP 1162 is referenced within 49 CFR Parts 192 and 195, see Appendix-A to this report.

The goal of RP-1162 is to establish guidelines for operators on development, implementation, and evaluation of public awareness programs in an effort to raise the effectiveness of these programs throughout the country.

RP-1162 provides guidance in the following areas:

Public Awareness Programs—The goal of the pipeline operator's Public Awareness Program is to enhance public environmental and safety property protection through increased public awareness and knowledge. A more informed public along pipeline routes supplements operator safety measures and contributes to reducing the likelihood and potential impact of pipeline emergencies and releases. RP-1162 places a major emphasis on prevention of pipeline accidents and emergencies caused by third-party damage. Communicating to the public awareness of safe excavation practices and the use of the "One-Call System" is an important element of the awareness program. Equally important is the need to communicate information to emergency responders on the potential hazards of pipelines, their locations within the community, and the availability of emergency response information resources.

Stakeholder Audiences—One of the initial tasks in developing a Public Awareness Program is to identify the audiences that should receive the program's message. RP-1162 describes the various stakeholder audiences and provides guidance on the type of information that should be shared with the target audiences. The four major stakeholder audiences include: 1) the Affected Public, 2) Emergency Officials, 3) Local Public Officials, and 4) Excavators.

Message Content—The same pipeline awareness information does not necessarily need to be provided to every stakeholder at the same time interval.

RP-1162 provides guidance for pipeline operators on the optimum combination of the message, delivery method, and frequency that meets the needs of the intended audience. The key information that needs to be communicated to stakeholders includes how to identify a potential hazard, how individuals can protect themselves, and how to notify emergency response personnel and pipeline operators of incidents. Several components of these messages are discussed and examples are provided in the appendix section of RP-1162.

Message Delivery Methods—There are a variety of message delivery methods and tools available to pipeline operators to provide effective communications with the intended stakeholder. The content of messages should be tailored to the needs of the audience, type of pipeline and facilities, the intent of the communication, and the appropriate method or media for the content. RP-1162 provides detailed guidelines for message delivery information.

API 1162 Section C-4

RP 1162 Section C.4 provides pipeline operators with guidance on emergency preparedness communications. The following key points are made in Section C.4:

- Pipeline operators should communicate periodically with local emergency officials on all aspects pipeline operator's Public Awareness Programs *(See Section C.4.)*

- Key messages from the pipeline operator to emergency officials should emphasize that public safety and environmental protection are the top priorities in any pipeline emergency response. *(See Section C.4.1).*

- Pipeline operator contact information for local offices and 24-hour emergency telephone numbers should be communicated to local and state emergency officials. *(See Section C.4.2).*

- Pipeline operators should use public awareness contact opportunities to confirm contact information for local and state emergency officials and their calling priorities. *(See Section C.4.2).*

- Operators are required by federal regulations to have emergency response plans. Emergency response plans should be developed by pipeline operators for both internal and external use for appropriate emergency response officials and in compliance with 49 CFR 192 and 194 as well as respective state regulations where applicable. *(See Section C.4.3).*

- With respect to emergency planning, pipeline operators should develop emergency plans in cooperation with local emergency responders to enhance communications and response to emergencies. In other words, pipeline emergency response plans should not be developed solely as an internal plan, but also as a planning document developed for external use by responders and in cooperation with agencies that may be expected to respond to a wide range of emergency contingencies. *(See Section C.4.3).*

- Pipeline operators should develop two-way communications with emergency responders by participating in hands-on drills and exercises. *(See Section C.4.4).*

- Pipeline operators should be familiar with the incident command system and the process of participating in a Unified Command when multiple agency responses are required to mitigate a pipeline accident. *(See Section C.4.4).*

Sources:

1. RP 1162, *Public Awareness Programs for Pipeline Operators,* American Petroleum Institute, Washington, D.C. *(2005). Note:* API provides the public free access to Government Cited and Safety Documents as *Read Only* documents. A copy of RP-1162 is available for viewing on its web site at www.api.org.
2. *Pipeline Emergencies*, 2nd Edition, by Gregory G. Noll and Michael S. Hildebrand, National Association of State Fire Marshals, (2011).

American Gas Association (AGA)

The American Gas Association (AGA) represents local energy distribution companies that deliver natural gas to more than 52 million homes, businesses, and industries throughout the United States. AGA member companies account for over 80% of all natural gas delivered by local natural gas distribution companies. AGA is an advocate for local natural gas utility companies and provides a broad range of programs and services for member natural gas pipelines, marketers, gatherers, international gas companies, and industry associates.

Through its Operations and Engineering Section, AGA develops a wide range of industry programs that pertain to natural gas piping systems, pipeline operations, and related appliances. AGA serves as the secretariat to the ANSI Z380 Gas Piping Technology Committee, which produces the *Guide for Gas Transmission and Distribution Piping Systems.* Additional information on AGA can be found at www.aga.org

AGA Best Practices Benchmarking

Considered as one of AGA's signature and most valuable programs, the AGA Operations Best Practices Benchmarking is an effort to identify procedures of superior-performing gas industry companies and innovative work practices that can be used to improve participants' operations and reduce cost. The Program is comprised of three areas: Gas Distribution, Gas Transmission and Supplemental Gas (LNG and propane-air operations).

AGA Best Practices Program

AGA operates three best practices programs directed at Gas Distribution, Gas Transmission, and Propane and LNG facilities.

AGA Best Practices Program for Gas Distribution - The Best Practices Program for Gas Distribution was initiated in 1994. Typically 70 or more gas distribution companies participate in this utility members-only program. AGA conducts an average of five studies per year on gas distribution operations topics, such as Leak Management, New Piping Construction, Damage Prevention, Employee Safety, and External Corrosion Prevention, among other topics.

AGA Gas Transmission Best Practices Program - The Gas Transmission Best Practices Program was started in 1995 and is conducted jointly with the Southern Gas Association (SGA). The Program typically has 40 or so members participating, with about one-half of the participants being distribution companies with transmission lines. The group usually studies three topics per year such as Pipeline Integrity, Lost & Unaccounted for Gas, Pipeline Repair, Engine Compressor Analysis, and Technical Training.

AGA Supplemental Gas Best Practices Program - The Supplemental Gas Best Practices Program was started in 2001 as the Liquefied Natural Gas (LNG) Best Practices Program. The program was renamed the Supplemental Gas Best Practices Program in 2009 to more effectively incorporate data collected on propane-air plant operations. The Supplemental Gas Program has about 30 companies with over 40 LNG and propane-air facilities participating. Typical benchmarking topics include Facility Profile, Management of Change, Relief Valve Testing, Plant Maintenance, Employee Safety and Fire Fighting Safety.

AGA Engineering Technical Notes Program

The AGA occasionally publishes technical papers known as "Engineering Technical Notes" to provide guidance to natural gas service companies on a variety of safety and engineering topics.

In March 2012, AGA issued a Technical Note on *Industry Considerations for Emergency Response Plans*. The purpose of this document is to provide guidance to natural gas service companies in developing an emergency response plan. The document was developed in response to a November 3, 2010 PHMSA advisory reminding pipeline operators of their requirements to make their emergency response plans available to emergency responders, as required by 49 CFR Section 192.615 (Emergency Response Plans) and 49 CFR Section 192.616 (Public Education Programs).

The position taken by AGA in *Industry Considerations for Emergency Response Plans* is that the information provided to emergency responders should be comprehensive enough to give them the knowledge needed to address specific hazards that may be present, however, the plan should not include unnecessary information. AGA's has taken a position that its member companies do not agree with the requirement for pipeline operators to share their actual emergency response plans with local emergency responders. AGA further states that, "These plans are more detailed than what is needed by emergency responders and they contain confidential corporate information that could easily be used against the interests of public safety if lost or stolen."

AGA's guidance provided to members is that the information contained in the emergency response plans should be the foundation for the utility's emergency response and communications education campaign. Essentially, AGA believes that the gas utility's emergency response plan and education campaign should speak the same language.

From a best practices perspective, AGA recommends that the following key issues be addressed when structuring an emergency response communications plan:

- Identify the mechanisms to disseminate pipeline safety and emergency response information. The communications mechanisms may be different based on the target audience of emergency responders.

- Identify the best way to prepare emergency responders for a pipeline accident.

- Identify the appropriate way to gauge the effectiveness of the safety communications.

- Determine what type of incident warrants an emergency call to 911.

- Determine how emergency responders can be encouraged to participate in emergency response training.

- Determine the types of information that are appropriate to share in emergency communications.

Industry Considerations for Emergency Response Plans provides a checklist of information AGA feels is important to communicate to emergency responders. The key topics outlined in the checklist that should be provided to emergency responders include:

- Natural gas physical and chemical properties.
- Overview of the natural gas pipeline system including a description of transmission pipelines in the area with reference to the National Pipeline Mapping System.
- A description of the utility's capabilities of responding to natural gas emergencies and events.
- Type of emergency situations requiring an immediate response. Examples provided include a significant leak or line break; gas ignition, explosion, rupture, or fire; hissing noises from a broken pipe; a damaged facility; gas odor throughout the building; and gas in a sewer.
- Actions to be performed by emergency responders vs. the pipeline operator.

Sources:

1. Technical Note on *Industry Considerations for Emergency Response Plans*, American Gas Association, Washington, D.C. (2012).
2. American Gas Association Web Site. www.api.org.
3. *Pipeline Emergencies*, 2nd Edition, by Gregory G. Noll and Michael S. Hildebrand, National Association of State Fire Marshals, (2011).

Common Ground Alliance

The Common Ground Alliance (CGA) is a trade association dedicated to ensuring public safety, environmental protection, and the integrity of services by promoting effective damage prevention practices. In recent years, the association has established itself as the leading organization in an effort to reduce damages to all underground facilities in North America through shared responsibility among all stakeholders.

Transportation Equity Act for the 21st Century

In June 1998 the U.S. Congress signed into law, the Transportation Equity Act for the 21st Century, also known as TEA 21. Section 6105 of TEA 21 authorized the United States Department of Transportation (DOT) to undertake a study of damage prevention practices associated with existing one-call notification systems. This resulted in the development of the *Common Ground Study*.

In August 1999 the study team produced a collection of best practices in one-call and damage prevention programs. The best practices developed address the following areas: Planning and Design; One-Call Center; Locating and Marking; Excavation; Mapping; Compliance; Public Education and Awareness; and Reporting and Evaluation.

Following the Common Ground study initiatives, in 2000, the Common Ground Alliance (CGA) was formed to further the work completed during the study. The CGA then formed the Best Practices Committee to identify, develop, and promote best practices. These practices address key elements to successful damage prevention programs for underground facilities including: stakeholder communication while planning construction activities; accessibility of one-call centers; accurate locating and marking; safe digging throughout excavation; education and enforcement to facilitate compliance; marketing strategies to enhance public education; and effective reporting and evaluation of damage prevention programs.

CGA Best Practices Guide

The CGA Best Practices Manual Version 9.0, March 2012, Section-8, addresses the best practice for Public Education and Awareness. The best practice covers the following topics:

- Marketing Plan
- Target audiences
- Structured education programs
- Target mailings
- Paid advertising
- Free media
- Giveaways
- Establishing strategic relationships
- Measuring public education success

The research team conducted a review of Best Practices Version 9.0 to determine if emergency responders are discussed with respect to communicating emergency planning needs. The following observations were made:

1. Section 8-3, *Target Audiences and Needs*, specifically lists emergency responders and local emergency planning members as one of twenty-five potential target audience groups.

2. Section 8-4, *Structured Education Programs*, states that, structured education programs with a meal function are an effective method to communicate with emergency responders, however no specific guidance is provided concerning the message content or method of delivery.

3. The Glossary includes definitions for the following terms:

   - Emergency - A sudden or unforeseen occurrence involving a clear and imminent danger to life, health, or property; the interruption of essential utility services; or the blockage of transportation facilities that requires immediate action.

   - Emergency Notice - A communication to the one call center to alert the involved underground facility owners/operators of the need to excavate as a result of a sudden or unforeseen occurrence or national emergency involving a clear and imminent danger to life, health, environment, or property (including the interruption of essential utility services or the blockage of transportation facilities) that requires immediate excavation.

   - Emergency Response – A facility owner/operators response to an emergency notice.

Other than the material outlined above, there are no other sections in the CGA Best Practice Guide that provides guidance to pipeline operators or utilities concerning the best way to communicate emergency response plans or information to emergency responders.

Sources:

1. *Best Practices Version 9.0*, Common Ground Alliance, Alexandria, Virginia, (March 2012).
2. Common Ground Alliance Web Site. http://www.commongroundalliance.com
3. *Pipeline Emergencies*, 2nd Edition, by Gregory G. Noll and Michael S. Hildebrand, National Association of State Fire Marshals, (2011).

Pipeline Association for Public Awareness

The Pipeline Association for Public Awareness (PAPA) is a nonprofit corporation established in 2004 to provide educational information concerning pipeline safety and emergency preparedness to residents and businesses located near pipelines, emergency responders, and public officials in communities with pipelines and excavators working near pipelines.

PAPA believes that open communication and cooperation with local

organizations enhances public safety, improves emergency preparedness, protects the environment and prevents damage to pipeline property and facilities.

PAPA administers pipeline safety and emergency readiness programs for Emergency Responders, Excavators, Public Officials, One-Call centers and School Officials across the United States.

Excavation Safety Guide & Directory

PAPA's Excavation Safety Guide & Directory is designed to inform the public and excavators of the hazards and risks associated with digging in and around public and private underground utilities and pipelines. The Guide provides a broad overview of what people need to know before they dig, how to dig safely, and what action should be taken if an underground utility or pipeline has been stuck accidentally. A detailed resource directory is also provided with contacts.

The guide specifically addresses what individuals should do when things go wrong. A General Pipeline Leak, Hazard and Emergency Response matrix is provided with guidance on action that should be taken for emergency contingencies. The general hazard categories addressed in the matrix include:

- Odorized natural gas leak
- Unodorized natural gas leak
- Petroleum liquids leak (gasoline, jet fuel, crude oil)
- Highly Volatile Liquids (propane, butane, ethane)
- Anhydrous Ammonia
- Carbon Dioxide
- Sour Crude Oil (hydrogen sulfide)

For each of the above contingencies, the matrix provides guidance on the desired emergency action that should be taken. The general categories include:

- Indications of a leak
- Hazard of a release
- Emergency response actions to be taken

The matrix provides emergency action guidance for 32 subcategories of emergency contingencies.

Emergency Response Resources

PAPA maintains an extensive collection of training and resource materials intended to provide firefighters, law enforcement officers, emergency medical technicians and other first responders with the information they need to safely respond to a pipeline emergency. These materials are not intended to provide information on the physical or chemical properties of the products transported through the pipelines, nor should they be considered a substitute for emergency response training, knowledge or sound judgment. Rather, this list of resources contains information that will help you make decisions about how to best protect your emergency response, the public, property and the environment during a pipeline incident.

Sources:

1. *Excavation Safety Guide & Directory*, Issue Number 7, Pipeline Association for Public Awareness, Golden, Colorado, (2012).
2. Pipeline Association for Public Awareness Web Site. http://www.pipelineawareness.org

Summary

There are four primary voluntary consensus standards and best practices that pertain to communicating emergency planning and response information to both the first responder community and public stakeholders. These consensus standards and best practices are developed by a combination of pipeline industry, trade association and nonprofit organizations, and include:

- American Petroleum Institute (API) RP 1162, Public Awareness Programs for Pipeline Operators
- American Gas Association (AGA) Best Practices Benchmarking
- Common Ground Alliance (CGA) Best Practices Guide
- Pipeline Association for Public Awareness (PAPA) Excavation Guide and Directory and Emergency Response Resources

Key observations noted in the review included:

- There are no voluntary consensus standards or best practices pertaining to pipeline safety and emergency preparedness that have been developed by the first responder community. This includes stakeholders representing the fire service and emergency management communities.
- Based upon its direct linkage with federal regulatory requirements, API RP 1162 is the most referenced voluntary consensus standard pertaining to emergency planning and public awareness issues, especially for liquid petroleum product pipeline operators. Key stakeholders targeted by RP 1162 include local and state emergency preparedness agencies and officials, the public, and excavators. The RP 1162 information is consistent with comparable information found in pipeline and related emergency planning and response training materials.
- Pipeline safety and emergency planning and response, as well as communications from the pipeline industry to affected stakeholders, are among the topics covered by the AGA Best Practices Programs. The AGA programs focus on natural gas distribution and transmission, as well as related operations (e.g., LNG, propane, etc.). AGA has also published a Technical Note on *Industry Considerations for Emergency Response Plans* that outlines the key information that should be provided to emergency responders. The Technical Note topics are consistent with comparable information found in pipeline and related emergency response training materials.

- While emergency responders are included in the CGA Best Practices Manual target audience, there is limited information concerning the best methods to communicate emergency response plans or information to emergency responders.
- PAPA maintains an extensive collection of training and resource materials that can be incorporated into first responder training programs pertaining to pipeline emergencies. Unlike RP 1162 and the AGA Technical Note which provide industry standards / benchmarks for pipeline operators, PAPA provides resources and materials that can be incorporated into both pipeline industry and first responder community programs.

Appendix-A

Summary of Principal Compliance Elements in 49 CFR Parts 192 and 195 Related to API RP 1162.

API 1162 *Public Awareness Programs for Pipeline Operators* is a recommended practice developed by the American Petroleum Institute (API) as a consensus standard for pipeline operators. API 1162 is intended to help pipeline operators comply with federal regulatory requirements found in 49 CFR Parts 192 and 195.

There are three principal compliance elements in 49 CFR Parts 192 and 195 related to API 1162. These are:

1. **Compliance Element # 1: Public Education (49 CFR Parts 192.616 and 195.440).** These regulations require pipeline operators to establish continuing education programs that enable the public, appropriate government organizations, and excavators to recognize a pipeline emergency and report it to the operator and/or the fire, police, or other appropriate public officials.

The requirements related to public education or emergency planning and response are highlighted in the shaded areas below.

§ 192.616Public Awareness.

(a) Except for an operator of a master meter or petroleum gas system covered under paragraph (j) of this section, each pipeline operator must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162 (incorporated by reference, see §192.7).

(b) The operator's program must follow the general program recommendations of API RP 1162 and assess the unique attributes and characteristics of the operator's pipeline and facilities.

(c) The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

(d) The operator's program must specifically include provisions to educate the public, appropriate government organizations, and persons engaged in excavation related activities on:

(1) Use of a one-call notification system prior to excavation and other damage prevention activities;

(2) Possible hazards associated with unintended releases from a gas pipeline facility;

(3) Physical indications that such a release may have occurred;

(4) ***Steps that should be taken for public safety in the event of a gas pipeline release; and***

(5) ***Procedures for reporting such an event.***

(e) The program must include activities to advise affected municipalities, school districts, businesses, and residents of pipeline facility locations.

(f) The program and the media used must be as comprehensive as necessary to reach all areas in which the operator transports gas.

(g) The program must be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(h) Operators in existence on June 20, 2005, must have completed their written programs no later than June 20, 2006. The operator of a master meter or petroleum gas system covered under paragraph (j) of this section must complete development of its written procedure by June 13, 2008. Upon request, operators must submit their completed programs to PHMSA or, in the case of an intrastate pipeline facility operator, the appropriate State agency.

(i) The operator's program documentation and evaluation results must be available for periodic review by appropriate regulatory agencies.

(j) Unless the operator transports gas as a primary activity, the operator of a master meter or petroleum gas system is not required to develop a public awareness program as prescribed in paragraphs (a) through (g) of this section. Instead the operator must develop and implement a written procedure to provide its customers public awareness messages twice annually. If the master meter or petroleum gas system is located on property the operator does not control, the operator must

provide similar messages twice annually to persons controlling the property. The public awareness message must include:

(1) A description of the purpose and reliability of the pipeline;

(2) An overview of the hazards of the pipeline and prevention measures used;

(3) Information about damage prevention;

(4) How to recognize and respond to a leak; and (5) How to get additional information.

§ 195.440 Public Awareness.

(a) ***Each pipeline operator must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162 (incorporated by reference, see §195.3).***

(b) The operator's program must follow the general program recommendations of API RP 1162 and assess the unique attributes and characteristics of the operator's pipeline and facilities.

(c) The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

(d) The operator's program must specifically include provisions to educate the public, appropriate government organizations, and persons engaged in excavation related activities on:

(1) Use of a one-call notification system prior to excavation and other damage prevention activities;

(2) Possible hazards associated with unintended releases from a hazardous liquid or carbon dioxide pipeline facility;

(3) Physical indications that such a release may have occurred;

(4) Steps that should be taken for public safety in the event of a hazardous liquid or carbon dioxide pipeline release; and

(5) Procedures to report such an event.

(e) The program must include activities to advise affected municipalities, school districts, businesses, and residents of pipeline facility locations.

(f) The program and the media used must be as comprehensive as necessary to reach all areas in which the operator transports hazardous liquid or carbon dioxide.

(g) The program must be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(h) Operators in existence on June 20, 2005, must have completed their written programs no later than June 20, 2006. Upon request, operators must submit their completed programs to PHMSA or, in the case of an intrastate pipeline facility operator, the appropriate State agency.

(i) The operator's program documentation and evaluation results must be available for periodic review by appropriate regulatory agencies.
[Amdt. 195–84, 70 FR 28843, May 19, 2005]

2. **Compliance Element # 2: Emergency Responder Liaison Activities (49 CFR Parts 192.615 and 195.402).** These regulations require operators to establish and maintain liaison with fire, police, and other appropriate public officials, and to coordinate with them on emergency exercises/drills and actual responses during an emergency.

§ 192.615 Emergency Plans.

(a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

(1) Receiving, identifying, and classifying notices of events which require immediate response by the operator.

(2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.

(3) Prompt and effective response to a notice of each type of emergency, including the following:

(i) Gas detected inside or near a building.

(ii) Fire located near or directly involving a pipeline facility.

(iii) Explosion occurring near or directly involving a pipeline facility.

(iv) Natural disaster.

(4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.

(5) Actions directed toward protecting people first and then property.

(6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

(7) Making safe any actual or potential hazard to life or property.

(8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

(9) Safely restoring any service outage.

(10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible.

(11) Actions required to be taken by a controller during an emergency in accordance with §192.631.

(b) Each operator shall:

(1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures.

(2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.

(3) Review employee activities to determine whether the procedures were effectively followed in each emergency.

(c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

(1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency

(2) Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;

(3) Identify the types of gas pipeline emergencies of which the operator notifies the officials; and

(4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

[Amdt. 192–24, 41 FR 13587, Mar. 31, 1976, as amended by Amdt. 192–71, 59 FR 6585, Feb. 11, 1994; Amdt. 192–112, 74 FR 63327, Dec. 3, 2009]

§ 195.402 Procedural Manual for Operations, Maintenance, and Emergencies.

(a) General. Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. This manual shall be reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline system commence, and appropriate parts shall be kept at locations where operations and maintenance activities are conducted.

(b) The Administrator or the State Agency that has submitted a current certification under the pipeline safety laws (49 U.S.C. 60101 *et seq.*) with respect to the pipeline facility governed by an operator's plans and procedures may, after notice and opportunity for hearing as provided in 49 CFR 190.237 or the relevant State procedures, require the operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

(c) *Maintenance and normal operations.* The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:

(1) Making construction records, maps, and operating history available as necessary for safe operation and maintenance.

(2) Gathering of data needed for reporting accidents under subpart B of this part in a timely and effective manner.

(3) Operating, maintaining, and repairing the pipeline system in accordance with each of the requirements of this subpart and subpart H of this part.

(4) Determining which pipeline facilities are located in areas that would require an immediate response by the operator to prevent hazards to the public if the facilities failed or malfunctioned.

(5) Analyzing pipeline accidents to determine their causes.

(6) Minimizing the potential for hazards identified under paragraph (c)(4) of this section and the possibility of recurrence of accidents analyzed under paragraph (c)(5) of this section.

(7) Starting up and shutting down any part of the pipeline system in a manner designed to assure operation within the limits prescribed by §195.406, consider the hazardous liquid or carbon dioxide in transportation, variations in altitude along the pipeline, and pressure monitoring and control devices.

(8) In the case of a pipeline that is not equipped to fail safe, monitoring from an attended location pipeline pressure during startup until steady state pressure and flow conditions are reached and during shut-in to assure operation within limits prescribed by §195.406.

(9) In the case of facilities not equipped to fail safe that are identified under paragraph 195.402(c)(4) or that control receipt and delivery of the hazardous liquid or carbon dioxide, detecting abnormal operating conditions by monitoring pressure, temperature, flow or other appropriate operational data and transmitting this data to an attended location.

(10) Abandoning pipeline facilities, including safe disconnection from an operating pipeline system, purging of combustibles, and sealing abandoned facilities left in place to minimize safety and environmental hazards. For each abandoned offshore pipeline facility or each abandoned onshore pipeline facility that crosses over, under or through commercially navigable waterways the last operator of that facility must file a report upon abandonment of that facility in accordance with §195.59 of this part.

(11) Minimizing the likelihood of accidental ignition of vapors in areas near facilities identified under paragraph (c)(4) of this section

where the potential exists for the presence of flammable liquids or gases.

(12) Establishing and maintaining liaison with fire, police, and other appropriate public officials to learn the responsibility and resources of each government organization that may respond to a hazardous liquid or carbon dioxide pipeline emergency and acquaint the officials with the operator's ability in responding to a hazardous liquid or carbon dioxide pipeline emergency and means of communication.

(13) Periodically reviewing the work done by operator personnel to determine the effectiveness of the procedures used in normal operation and maintenance and taking corrective action where deficiencies are found.

(14) Taking adequate precautions in excavated trenches to protect personnel from the hazards of unsafe accumulations of vapor or gas, and making available when needed at the excavation, emergency rescue equipment, including a breathing apparatus and, a rescue harness and line.

(15) Implementing the applicable control room management procedures required by §195.446.

(d) *Abnormal operation.* The manual required by paragraph (a) of this section must include procedures for the following to provide safety when operating design limits have been exceeded:

(1) Responding to, investigating, and correcting the cause of:

(i) Unintended closure of valves or shutdowns;

(ii) Increase or decrease in pressure or flow rate outside normal operating limits;

(iii) Loss of communications;

(iv) Operation of any safety device;

(v) Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property.

(2) Checking variations from normal operation after abnormal operation has ended at sufficient critical locations in the system to

determine continued integrity and safe operation.

(3) Correcting variations from normal operation of pressure and flow equipment and controls.

(4) Notifying responsible operator personnel when notice of an abnormal operation is received.

(5) Periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.

(e) *Emergencies.* The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs:

(1) ***Receiving, identifying, and classifying notices of events which need immediate response by the operator or notice to fire, police, or other appropriate public officials and communicating this information to appropriate operator personnel for corrective action.***

(2) Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental release of hazardous liquid or carbon dioxide from a pipeline facility, operational failure causing a hazardous condition, and natural disaster affecting pipeline facilities.

(3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.

(4) Taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume of hazardous liquid or carbon dioxide that is released from any section of a pipeline system in the event of a failure.

(5) Control of released hazardous liquid or carbon dioxide at an accident scene to minimize the hazards, including possible intentional ignition in the cases of flammable highly volatile liquid.

(6) Minimization of public exposure to injury and probability of accidental ignition by assisting with evacuation of residents and assisting with halting traffic on roads and railroads in the affected area, or taking other appropriate action.

(7) Notifying fire, police, and other appropriate public officials of

hazardous liquid or carbon dioxide pipeline emergencies and coordinating with them preplanned and actual responses during an emergency, including additional precautions necessary for an emergency involving a pipeline system transporting a highly volatile liquid.

(8) In the case of failure of a pipeline system transporting a highly volatile liquid, use of appropriate instruments to assess the extent and coverage of the vapor cloud and determine the hazardous areas.

(9) Providing for a post accident review of employee activities to determine whether the procedures were effective in each emergency and taking corrective action where deficiencies are found.

(10) Actions required to be taken by a controller during an emergency, in accordance with §195.446.

(f) *Safety-related condition reports.* The manual required by paragraph (a) of this section must include instructions enabling personnel who perform operation and maintenance activities to recognize conditions that potentially may be safety-related conditions that are subject to the reporting requirements of §195.55.

3. **Compliance Element # 3: Damage Prevention (49 CFR Parts 192.614 and 195.442).** These regulations require pipeline operators to carry out written programs to prevent damage to pipelines by excavation activities.

The relevant stakeholder audiences of PR 1162 are the affected public (i.e., residents along the pipeline ROW and nearby residents), emergency officials, local public officials, excavators/contractors, land developers, and one-call centers.

There are three operator categories: Hazardous liquids and natural gas pipeline operators, local natural gas distribution companies, and gathering pipeline operators.

The three major requirements concern message type, frequency of delivery, and delivery method and/or media.

Safety messages must be specific to each of the target audiences, they must be delivered in an effective manner, and with a frequency appropriate for the audience.

Other requirements include evaluating program effectiveness (due on 4 year intervals).

All pipeline operators are required to develop and implement a pipeline safety public awareness program to educate the public in the vicinity of the pipeline, as well as state and local emergency response personnel, public officials and excavators. Individuals living in the vicinity of a pipeline should be updated periodically.

Appendix-B

Summary of Principal Elements in API RP 1162

API 1162 *Public Awareness Programs for Pipeline Operators* is a recommended practice developed by the American Petroleum Institute (API) as a consensus standard for pipeline operators. API 1162 is intended to help pipeline operators comply with federal regulatory requirements found in CFR 49 CFR Parts 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards* and 195, *Transportation of Hazardous Liquids by Pipeline*.

There are three principal compliance elements in 49 CFR Parts 192 and 195 related to API 1162. These are:

1. **Compliance Element # 1: Public Education (49 CFR Parts 192.616 and 195.440).** These regulations require pipeline operators to establish continuing education programs that enable the public, appropriate government organizations, and excavators to recognize a pipeline emergency and report it to the operator and/or the fire, police, or other appropriate public officials.

The requirements related to public education or emergency planning and response are highlighted in the shaded areas below.

§ 192.616 Public Awareness.

(a) Except for an operator of a master meter or petroleum gas system covered under paragraph (j) of this section, each pipeline operator must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162 (incorporated by reference, see §192.7).

(b) The operator's program must follow the general program recommendations of API RP 1162 and assess the unique attributes and characteristics of the operator's pipeline and facilities.

(c) The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

(d) The operator's program must specifically include provisions to educate the public, appropriate government organizations, and persons engaged in excavation related activities on:

(1) Use of a one-call notification system prior to excavation and other damage prevention activities;

(2) Possible hazards associated with unintended releases from a gas pipeline facility;

(3) Physical indications that such a release may have occurred;

(4) ***Steps that should be taken for public safety in the event of a gas pipeline release; and***

(5) ***Procedures for reporting such an event.***

(e) The program must include activities to advise affected municipalities, school districts, businesses, and residents of pipeline facility locations.

(f) The program and the media used must be as comprehensive as necessary to reach all areas in which the operator transports gas.

(g) The program must be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(h) Operators in existence on June 20, 2005, must have completed their written programs no later than June 20, 2006. The operator of a master meter or petroleum gas system covered under paragraph (j) of this section must complete development of its written procedure by June 13, 2008. Upon request, operators must submit their completed programs to PHMSA or, in the case of an intrastate pipeline facility operator, the appropriate State agency.

(i) The operator's program documentation and evaluation results must be available for periodic review by appropriate regulatory agencies.

(j) Unless the operator transports gas as a primary activity, the operator of a master meter or petroleum gas system is not required to develop a public awareness program as prescribed in paragraphs (a) through (g) of this section. Instead the operator must develop and implement a written procedure to provide its customers public

awareness messages twice annually. If the master meter or petroleum gas system is located on property the operator does not control, the operator must provide similar messages twice annually to persons controlling the property. The public awareness message must include:

(1) A description of the purpose and reliability of the pipeline;

(2) An overview of the hazards of the pipeline and prevention measures used;

(3) Information about damage prevention;

(4) How to recognize and respond to a leak; and

(5) How to get additional information.

§ 195.440 Public Awareness.

(a) ***Each pipeline operator must develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API) Recommended Practice (RP) 1162 (incorporated by reference, see §195.3).***

(b) The operator's program must follow the general program recommendations of API RP 1162 and assess the unique attributes and characteristics of the operator's pipeline and facilities.

(c) The operator must follow the general program recommendations, including baseline and supplemental requirements of API RP 1162, unless the operator provides justification in its program or procedural manual as to why compliance with all or certain provisions of the recommended practice is not practicable and not necessary for safety.

(d) The operator's program must specifically include provisions to educate the public, appropriate government organizations, and persons engaged in excavation related activities on:

(1) Use of a one-call notification system prior to excavation and other damage prevention activities;

(2) Possible hazards associated with unintended releases from a hazardous liquid or carbon dioxide pipeline facility;

(3) Physical indications that such a release may have occurred;

(4) Steps that should be taken for public safety in the event of a hazardous liquid or carbon dioxide pipeline release; and

(5) Procedures to report such an event.

(e) The program must include activities to advise affected municipalities, school districts, businesses, and residents of pipeline facility locations.

(f) The program and the media used must be as comprehensive as necessary to reach all areas in which the operator transports hazardous liquid or carbon dioxide.

(g) The program must be conducted in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the operator's area.

(h) Operators in existence on June 20, 2005, must have completed their written programs no later than June 20, 2006. Upon request, operators must submit their completed programs to PHMSA or, in the case of an intrastate pipeline facility operator, the appropriate State agency.

(i) The operator's program documentation and evaluation results must be available for periodic review by appropriate regulatory agencies. [Amdt. 195–84, 70 FR 28843, May 19, 2005]

2. **Compliance Element # 2: Emergency Responder Liaison Activities (49 CFR Parts 192.615 and 195.402).** These regulations require operators to establish and maintain liaison with fire, police, and other appropriate public officials, and to coordinate with them on emergency exercises/drills and actual responses during an emergency.

§ 192.615 Emergency Plans.

(a) Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

(1) Receiving, identifying, and classifying notices of events which require immediate response by the operator.

(2) Establishing and maintaining adequate means of communication with appropriate fire, police, and other public

officials.

(3) Prompt and effective response to a notice of each type of emergency, including the following:

(i) Gas detected inside or near a building.

(ii) Fire located near or directly involving a pipeline facility.

(iii) Explosion occurring near or directly involving a pipeline facility.

(iv) Natural disaster.

(4) The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.

(5) Actions directed toward protecting people first and then property.

(6) Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

(7) Making safe any actual or potential hazard to life or property.

(8) Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

(9) Safely restoring any service outage.

(10) Beginning action under §192.617, if applicable, as soon after the end of the emergency as possible.

(11) Actions required to be taken by a controller during an emergency in accordance with §192.631.

(b) Each operator shall:

(1) Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency

procedures established under paragraph (a) of this section as necessary for compliance with those procedures.

(2) Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.

(3) Review employee activities to determine whether the procedures were effectively followed in each emergency.

(c) Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

(1) Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency

(2) Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;

(3) Identify the types of gas pipeline emergencies of which the operator notifies the officials; and

(4) Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

[Amdt. 192–24, 41 FR 13587, Mar. 31, 1976, as amended by Amdt. 192–71, 59 FR 6585, Feb. 11, 1994; Amdt. 192–112, 74 FR 63327, Dec. 3, 2009]

§ 195.402 Procedural Manual for Operations, Maintenance, and Emergencies.

(a) General. Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. This manual shall be reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline system commence, and appropriate parts shall be kept at locations where operations and maintenance activities are conducted.

(b) The Administrator or the State Agency that has submitted a current certification under the pipeline safety laws (49 U.S.C. 60101 *et seq.)* with respect to the pipeline facility governed by an operator's plans

and procedures may, after notice and opportunity for hearing as provided in 49 CFR 190.237 or the relevant State procedures, require the operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

(c) *Maintenance and normal operations.* The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:

(1) Making construction records, maps, and operating history available as necessary for safe operation and maintenance.

(2) Gathering of data needed for reporting accidents under subpart B of this part in a timely and effective manner.

(3) Operating, maintaining, and repairing the pipeline system in accordance with each of the requirements of this subpart and subpart H of this part.

(4) Determining which pipeline facilities are located in areas that would require an immediate response by the operator to prevent hazards to the public if the facilities failed or malfunctioned.

(5) Analyzing pipeline accidents to determine their causes.

(6) Minimizing the potential for hazards identified under paragraph (c)(4) of this section and the possibility of recurrence of accidents analyzed under paragraph (c)(5) of this section.

(7) Starting up and shutting down any part of the pipeline system in a manner designed to assure operation within the limits prescribed by §195.406, consider the hazardous liquid or carbon dioxide in transportation, variations in altitude along the pipeline, and pressure monitoring and control devices.

(8) In the case of a pipeline that is not equipped to fail safe, monitoring from an attended location pipeline pressure during startup until steady state pressure and flow conditions are reached and during shut-in to assure operation within limits prescribed by §195.406.

(9) In the case of facilities not equipped to fail safe that are identified under paragraph 195.402(c)(4) or that control receipt and delivery of the hazardous liquid or carbon dioxide, detecting abnormal operating conditions by monitoring pressure,

temperature, flow or other appropriate operational data and transmitting this data to an attended location.

(10) Abandoning pipeline facilities, including safe disconnection from an operating pipeline system, purging of combustibles, and sealing abandoned facilities left in place to minimize safety and environmental hazards. For each abandoned offshore pipeline facility or each abandoned onshore pipeline facility that crosses over, under or through commercially navigable waterways the last operator of that facility must file a report upon abandonment of that facility in accordance with §195.59 of this part.

(11) Minimizing the likelihood of accidental ignition of vapors in areas near facilities identified under paragraph (c)(4) of this section where the potential exists for the presence of flammable liquids or gases.

(12) Establishing and maintaining liaison with fire, police, and other appropriate public officials to learn the responsibility and resources of each government organization that may respond to a hazardous liquid or carbon dioxide pipeline emergency and acquaint the officials with the operator's ability in responding to a hazardous liquid or carbon dioxide pipeline emergency and means of communication.

(13) Periodically reviewing the work done by operator personnel to determine the effectiveness of the procedures used in normal operation and maintenance and taking corrective action where deficiencies are found.

(14) Taking adequate precautions in excavated trenches to protect personnel from the hazards of unsafe accumulations of vapor or gas, and making available when needed at the excavation, emergency rescue equipment, including a breathing apparatus and, a rescue harness and line.

(15) Implementing the applicable control room management procedures required by §195.446.

(d) *Abnormal operation.* The manual required by paragraph (a) of this section must include procedures for the following to provide safety when operating design limits have been exceeded:

(1) Responding to, investigating, and correcting the cause of:

(i) Unintended closure of valves or shutdowns;

(ii) Increase or decrease in pressure or flow rate outside normal operating limits;

(iii) Loss of communications;

(iv) Operation of any safety device;

(v) Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property.

(2) Checking variations from normal operation after abnormal operation has ended at sufficient critical locations in the system to determine continued integrity and safe operation.

(3) Correcting variations from normal operation of pressure and flow equipment and controls.

(4) Notifying responsible operator personnel when notice of an abnormal operation is received.

(5) Periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.

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(2) Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental release of hazardous liquid or carbon dioxide from a pipeline facility, operational failure causing a hazardous condition, and natural disaster affecting pipeline facilities.

(3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.

(4) Taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume of hazardous liquid or carbon dioxide that is released from any section of a pipeline system in the event of a failure.

(5) Control of released hazardous liquid or carbon dioxide at an accident scene to minimize the hazards, including possible intentional ignition in the cases of flammable highly volatile liquid.

(6) Minimization of public exposure to injury and probability of accidental ignition by assisting with evacuation of residents and assisting with halting traffic on roads and railroads in the affected area, or taking other appropriate action.

(7) Notifying fire, police, and other appropriate public officials of hazardous liquid or carbon dioxide pipeline emergencies and coordinating with them preplanned and actual responses during an emergency, including additional precautions necessary for an emergency involving a pipeline system transporting a highly volatile liquid.

(8) In the case of failure of a pipeline system transporting a highly volatile liquid, use of appropriate instruments to assess the extent and coverage of the vapor cloud and determine the hazardous areas.

(9) Providing for a post-accident review of employee activities to determine whether the procedures were effective in each emergency and taking corrective action where deficiencies are found.

(10) Actions required to be taken by a controller during an emergency, in accordance with §195.446.

(f) *Safety-related condition reports.* The manual required by paragraph (a) of this section must include instructions enabling personnel who perform operation and maintenance activities to recognize conditions that potentially may be safety-related conditions that are subject to the reporting requirements of §195.55.

3. **Compliance Element # 3: Damage Prevention (49 CFR Parts 192.614 and 195.442).** These regulations require pipeline operators to carry out written programs to prevent damage to pipelines by excavation activities.

The relevant stakeholder audiences of PR 1162 are the affected public (i.e., residents along the pipeline ROW and nearby residents), emergency officials, local public officials, excavators/contractors, land developers, and one-call centers.

There are three operator categories: Hazardous liquids and natural gas pipeline operators, local natural gas distribution companies, and gathering pipeline operators.

The three major requirements concern message type, frequency of delivery, and delivery method and/or media.

Safety messages must be specific to each of the target audiences; they must be delivered in an effective manner, and with a frequency appropriate for the audience.

Other requirements include evaluating program effectiveness (due on 4 year intervals).

All pipeline operators are required to develop and implement a pipeline safety public awareness program to educate the public in the vicinity of the pipeline, as well as state and local emergency response personnel, public officials and excavators. Individuals living in the vicinity of a pipeline should be updated periodically.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

GLEN RIDDLE STATION, L.P.	:	
	:	Docket No. C-2020-3023129
v.	:	
	:	
SUNOCO PIPELINE L.P.	:	

REBUTTAL TESTIMONY

OF GREGORY G. NOLL

ON BEHALF OF SUNOCO PIPELINE, L.P.

SPLP STATEMENT NO. 1-R

Date: May 12, 2021

Q: What is your full name and current occupation?

A: My name is Gregory G. Noll and I am the Principal of GGN Technical Resources, LLC in Lancaster, Pennsylvania. GGN provides emergency planning, response and incident management consulting services to public safety, government and private organizations with a current focus on hazardous materials emergency response and incident management.

Q: Can you describe for me your educational background?

A: I have an associate degree in fire science from Prince George College in 1976, a bachelor's degree in business administration from Kutztown State College in 1978, and a master's degree in public administration with a minor in occupational safety and health in 1981 from Iowa State University.

Q: Do you have any professional certifications?

A: Yes. Since 1992 I have been a Certified Safety Professional in Comprehensive Practice by the Board of Certified Safety Professionals and a Certified Emergency Manager by examination since 2012 by the International Association of Emergency Managers. I am also credentialed as a Type 3 incident commander and a Type 3 operations section chief per the National Incident Management System. I also have numerous firefighter professional qualification certifications as a fire officer, a hazardous materials technician, a hazmat incident commander and as a hazmat officer.

Q: Can you describe your military experience?

A: I served in the United States Air Force for 29 years, which included active duty and service in the USAF Reserves and Air National Guard. I served as a senior fire officer within fire and emergency services and retired in 2012. Among my duties, I was involved in virtually every hazardous materials and weapons of mass destruction training program that was developed for emergency responders during the period 1997 to 2012. I retired as an E-8, or a senior master sergeant and possessed a TS/SCI security clearance.

Q: Can you highlight your work experience as it relates to emergency planning, emergency response and incident management?

A: I have been in the emergency services community for 50 years. I have served in a variety of different positions, encompassing volunteer, career, military and industry. Since approximately 1989, I have provided emergency planning and response consulting to both public safety personnel, government and industry. Also, from 2003 to 2018, I have served as the program manager for the South Central (PA) Regional Task Force, a nine-county emergency preparedness organization coordinated through the Pennsylvania Emergency Management Agency. In this role, I served as the program manager for the Homeland Security Grant Program. In that position, I managed the Task Force's day to day activities and dealt with virtually all elements of the emergency response community, ranging from agriculture to business and industry to fire to law enforcement to EMS. I supervised 15 Planning Specialists and a network of 10 subcommittees and related working groups. I remain involved in the Task Force as a Senior Planning Specialist.

Q: Do you have specific experience with respect to emergency response, emergency management and incident management with respect to pipelines?

A: Yes, in several areas. In 2004, I was contracted by the National Association of State Fire Marshals who received a grant from PHMSA to develop a pipeline emergencies curriculum. That led to the development of the Pipeline Emergencies textbook, which is now in its third edition. In addition, I have done substantial work over the years in the oil and chemical industry, not just in pipelines but also upstream and downstream facilities. The common theme is always going back to emergency planning and emergency response issues. In addition, I've served as an adjunct instructor for the National Fire Academy as well as for the FBI Technical Hazards Response Unit.

Q: Are you a member of any codes or standards committee relating to emergency response?

A: Yes. I am a current member and Past Chairperson of the National Fire Protection Association (NFPA) Technical Committee on Hazardous Materials and WMD Emergency Response. For the period of roughly 2007 to 2017, I served as the chair. That committee is responsible for the development of the training standards that directly pertain to hazardous materials emergency response. In addition, I have worked on several projects relative to pipeline audits and specific emergency response issues, such as high hazard flammable liquid trains and liquefied natural gas (LNG) transportation by rail.

Q: Have you served on any other standard or code setting committees?

A: Yes. I am a Member and Past Co-Chair of the Interagency Board for Emergency Preparedness and Response - Training and Exercise Group and a Member of the Pennsylvania

Pipeline Emergency Response Initiative. In addition, I have served on several projects of the National Academy of Sciences, Engineering and Medicine – Transportation Research Board, including Safely Transporting Hazardous Liquids and Gases in a Changing U.S. Energy Landscape (2018).

Q: Have you published any texts or articles on the subject of emergency response?

A: Yes. I have either authored or co-authored a total of ten textbooks or handbooks. Eight of those are stand-alone textbooks. The one that would be most pertinent to my testimony would be Hazardous Materials: Managing the Incident, which is now in its fourth edition. It was originally published in 1986. It has also been adopted by a number of states and agencies as the basis for their hazardous materials technician and incident commander training curriculum, directly leading to certification. In addition, I am involved with the Pipeline Emergencies curriculum, as I previously noted, which is the framework for what many of the pipeline companies use for their emergency response training.

Q: Have you also written any articles on these topics?

A: Yes. I have authored approximately 50 articles on topics pertaining to hazardous materials.

Q: Have you received any awards in this area?

A: In 2019 I was inducted into the National Fire Heritage Center – Hall of Legends, Legacies and Leaders. I previously received two lifetime achievement awards, one from the International Association of Fire Chiefs through their Hazardous Materials Committee, the second from the State of California through their hazardous materials response community. All of these pertain to

leadership and activities in the hazardous materials emergency response community. In addition, I have an award for valor as a member of Pennsylvania Task Force 1 responding to the World Trade Center attack.

Q: Have you ever received awards specific to your teaching and training?

A: Yes. At the Texas Hot Zone Conference in 2017 I received the Dieter J. Heinz Instructor of the Year Award and the Keystone Chapter of the International Society of Fire Service Instructors named me Educator of the Year in 1994.

Q: Have you ever testified before?

A: I have only testified three times – twice in the *Flynn et al. v. SPLP* matter before the PUC in November 2018 and October 2020, and once in the *Baker v. SPLP* case before the PUC in July 2019.

Q: Have you yourself served an emergency responder?

A: Yes. This has included experience as both a volunteer and career firefighter in Reading, PA, as a Senior Fire Instructor for Iowa State University – Fire Service Extension, as a volunteer firefighter and then career Hazardous Materials Coordinator for the Prince George's County (MD) Fire and Rescue Dept., as a military firefighter and senior fire officer at both the installation and command levels, and as a member of PA Task Force 1 Federal Urban Search and Rescue Teams.

Q: Is a copy of your resume attached as Exhibit SPLP GN-1?

A: Yes.

Q: Sunoco offers Gregory Noll as an expert in emergency planning, emergency response, emergency response and planning training, including as it relates to pipelines, hazardous materials and natural gas liquids.

Q: Have you looked at the testimony provided on behalf of Complainants regarding the Mariner East 2/2X pipeline construction and alleged concerns with emergency response and alleged fire hazards at the Glen Riddle Station Apartments – including the testimony of Stephen Iacobucci and Jason Culp, P.E.?

A: Yes, I have.

Q: What is the purpose of your testimony?

A: To provide conclusions on my evaluation of the Complainants concerns regarding emergency response and fire safety issues at the Glen Riddle Station Apartments during the Mariner East 2/2X pipeline construction, in particular in response to Complainants' concerns that there is a fire safety or hazard created by the construction work area, including the sound walls that are in place at the property, and traffic/access issues for emergency response vehicles to the property.

Q: First, have you developed and provided training to emergency planning and emergency response officials that is specifically related to the Mariner East pipelines?

A: Yes. The MERO program, the Mariner Emergency Responder Outreach program, is directly targeted towards emergency responders and planners along the pipeline right-of-way.

My role was to reach out to the county emergency management agencies along the pipeline right-of-way and to work with them on the scheduling, coordination and the logistics of the delivery of the classes. I served as the lead instructor for the MERO training deliveries in Pennsylvania, including the sessions in Delaware County. The classes were approximately two to two and a quarter hours in length, and approximately 20 programs have been delivered in each county along the right-of-way in 2020 - 2021. In Delaware County, the MERO training has been delivered two times in recent years – September 25, 2017 and October 14, 2017; and October 21, 2020 and November 4, 2020. The MERO training is primarily attended by firefighters, emergency managers, law enforcement, EMS, emergency medical services, and hospitals, township officials and representatives from the Department of Homeland Security. These MERO training programs are delivered periodically across the Mariner East pipeline corridor, and we are in the process of completing the 2020 – 2021 sessions.

Q: Did you also provide any training specifically for emergency responders in Middletown Township?

A: Yes, I facilitated a Pipeline Emergency Preparedness & Training Tabletop Exercise for Middletown Township Emergency Management on April 24, 2019 at the Middletown Township Building. This training provided an opportunity for emergency responders in Middletown Township to review their internal processes and procedures for responding to a pipeline incident using a tabletop exercise format, utilizing a hypothetical scenario involving a pipeline release from a Mariner East 2 valve site in Middletown Township. I facilitated the exercise in conjunction with Robert Drennen, Middletown Township Emergency Management Coordinator.

Q: Next, can you describe some of the concerns regarding emergency response and fire safety that Complainants have raised in their testimony?

A: Complainants claim that the installation of the sound walls at the property create "dangerous fire hazard conditions" (S. Iacobucci Direct Test. at 2:19-20), and concerns that placing the sound walls "approximately 5 ft. from our apartment buildings . . . would create a serious (and frankly, obvious) fire hazard by blocking the means of ingress and egress from the residential apartment buildings in the event of a fire, creating a fire trap" (S. Iacobucci Direct. Test. at 4:1-3). Complainants also claim that there were times that emergency vehicles were unable to access the property or could be unable to access the property in the event of an emergency (S. Iacobucci Direct Test. at 9:1-8). Complainants also claim that there are fire hazards created by the sound walls around the construction workspace at the property (S. Iacobucci Direct Test. at 13:8-14:10; Culp Direct Test. at 13-14). Complainants claim that the location of the sound walls have made it so that fire trucks have not been able to access the property, have difficultly safely exiting the property, and present concerns for ingress to the apartment buildings on the property (S. Iacobucci Direct Test. at 14:7-10; Culp Direct Test. at 13-14).

Q: Have you reviewed the placement and location of the temporary construction sound walls at the Glen Riddle Station Apartments, and do you have an opinion regarding whether or not they present a fire hazard?

A: Yes, layouts of the sound walls showing the approximate distance of the sound walls to the apartment buildings is attached as **SPLP Exhibit GN-2,** and an aerial drone image of the sound walls and active construction is attached as **SPLP Exhibit GN-3**. It is my professional opinion to a reasonable degree of certainty that the temporary sound walls do not represent a fire hazard and

do not impact fire department access / egress from the five apartment buildings that make up the apartment complex at a level that is significantly different than what was present prior to their installation.

Q: Complaints claim that emergency vehicles have been unable to access the property in the past or may have difficulty accessing the property for a future emergency. Do you agree with that concern? Why or why not?

A: No, I do not agree with that concern. On March 29, 2021 I conducted a 360-degree walk around of the construction site. Based upon my on-site review of the location of the sound barriers and the available road space, I did not see any issues that would not allow the fire department to either effectively position their apparatus or access a building that did not previously exist before the installation of the sound barrier. My assessment also included a review of the Google Earth maps of the pipeline right-of-way prior to the construction (*see* **SPLP Exhibit GN-4**), conversations with Robert Drennen, Middletown Township Emergency Coordinator, a review Mr. Culp's December 8, 2020 correspondence outlining Complainant's concerns (**SPLP Exhibit GN-5**), and a review of Mr. Drennen's memorandum to the Middletown Township Manager on December 10, 2020 outlining his recommendations (**SPLP Exhibit GN-6**).

Q: Have you reviewed Mr. Culp's testimony regarding alleged fire hazards at the property that he claims were created from the construction activity?

A: Yes, I have reviewed Mr. Culp's testimony and I do not agree with his conclusions. It should be noted that the pipeline construction project is a temporary construction project and the

specific sections of the International Fire Code cited by Mr. Culp pertain to permanent construction activities.

Mr. Culp claims that the original plan for the location of the sound walls was a close as 5 feet from the residences and would have blocked access for ladder rescue. I have reviewed the testimony of Jayme Fye (**SPLP Statement No. 4**), the testimony of Joseph Becker (**SPLP Statement No.** 3), and the testimony of David Amerikaner (**SPLP Statement No. 2**), which reflect that while Sunoco may have indicated in an initial conversation with GRS that the sound walls could be located as close as 5 feet from the apartment buildings – that potential location of the sound walls was never implemented. I can also attest that the current location of the sound walls – which as shown on the site layout drawings I reviewed (**SPLP Exhibit GN-2**), and as testified to by Mr. Becker (**SPLP Statement No. 3**) is approximately 18 feet away from the buildings – and which allows sufficient space for fire department personnel to access and deploy ground ladders to the upper floors of the adjoining buildings.

Mr. Culp also claims that the sound walls violate the International Fire Code because their location "deprives the GRS property and those who live there and access it of two separate and approved fire apparatus access roads" (Culp Direct Test. at 13:11-14). Mr. Culp's concerns appear to be based on his assumption that there is not sufficient ingress and egress to the buildings in the event of an emergency. In my professional opinion to a reasonable degree of certainty, this is not a valid concern, based upon the following: (1) Middletown Township fire units (i.e. Middletown Fire Company and Rocky Run Fire Company) physically visited the site with two different aerial apparatus to evaluate both apparatus access and the placement of ground ladders; (2) the Middletown Township Emergency Management Coordinator provided Sunoco with recommendations that would facilitate improved access and ladder placement during construction;

and (3) all of the Middletown Township recommendations, including movement of the sound barriers to improve access at several locations, were accepted and implemented by Sunoco.

Mr. Culp also claims the moveable section of the sound walls do not meet the definition in the International Fire Code of a fire apparatus access road gates. (Culp Direct Test. at 13-14). The fire department access road gates pertain to access onto a property, such as a gated community, and would also not be applicable to temporary construction activities.

Mr. Culp also claims there is not enough turn around space at the western side of the property, and that moveable sound walls should be placed there as well as where the moveable sound walls are placed on the eastern side of the property, which Mr. Culp claims "allows for the possibility that emergency vehicles, like fire trucks, will not maneuver as necessary in the time of an emergency" and that this "puts lives in immediate danger". (Culp Direct Test. at 14). In my professional opinion to a reasonable degree of certainty, Mr. Culp's concerns are incorrect and do not reflect the reality of emergency response. Once fire department vehicles access the property and are positioned, and their equipment (e.g., hoses, ladders, aerial devices) deployed, the probability of needing to move or reposition the apparatus is very low. Once the emergency is terminated, fire department units then would be able to safely depart or back out of the parking area with no time constraints.

Q: Mr. Culp focuses on certain specific sections of the International Fire Code (IFC) that he claims are being violated and create a safety risk or fire hazard at the property, including: IFC, Appendix D 103.4 - Dead Ends; IFC Appendix D 103.5 - Access Road Gates; and IFC Appendix D106 - Dwelling Units. Did you review these sections of the Fire Code and do you

have an opinion regarding their applicability to the Glen Riddle Station Apartments and the construction of the Mariner East 2/2X pipelines?

A: Yes, I have reviewed the provisions of the IFC that Culp cites in his testimony. As I previously noted, the pipeline construction project is a temporary construction project and the specific sections of the International Fire Code cited by Mr. Culp pertain to permanent construction activities. Given that the apartment complex was built in 1971, building-related fire codes that existed at that time were focused upon the density of building placement/exposures, and the potential for external fire spread. While five buildings make up the apartment complex, it is my professional opinion to a reasonable degree of certainty, that given building placement and spacing there is minimal risk of fire extension to multiple structures. If the Appendix D requirements would apply to this scenario, I respond to each of the IFC provisions cited by Mr. Culp below.

- Appendix D 103.4 – Mr. Culp argues that there is insufficient access / turning radius on the property due to the placement of the sound barriers and pipeline construction. Under D 103.3 - Turning Radius, the minimum turning radius shall be determined by the Fire Code Official. Turning radius also influences the dead-end requirement and the ability of fire apparatus to leave the incident scene. Given that – (1) the Middletown Township fire units has physically visited the site with two different aerial apparatus to evaluate both apparatus access and the placement of ground ladders; (2) the Middletown Township Emergency Management Coordinator provided Sunoco with recommendations that would facilitate improved fire department access and ladder placement during construction; and (3) all of the Middletown Township recommendations (including movement of the sound barrier walls to facilitate improved ladder access in several locations) were accepted and

implemented by Sunoco – it is clear that the fire department operational requirements for apparatus access, turning radius and portable ladder placement during construction are acceptable. Furthermore, there have been two emergency response calls to the property on December 12, 2020 and January 17, 2021 with no access issues.

- D 103.5 – Mr. Culp states that Sunoco violates IFC Section D103.5 - Fire Department Access Road Gates. However, this section pertains to situations where there are access gates to control egress onto a property (i.e., gated community) and would not apply to the GRS property.
- D 106 – Projects having more than 100 dwelling units shall be equipped throughout with two separate and approved fire apparatus excess roads (GRS has approximately 128 total dwelling units). Based upon Mr. Culp's testimony, GRS believes that the pipeline work should be shutdown because the dual access routes were eliminated. However, this is a temporary construction project and the code requirements would be satisfied upon completion of the project.

Q: Do you agree with Mr. Culp's opinions that the location and types of the sound walls at the Glen Riddle Station Apartments "have created an unacceptable and unreasonable threat to the safety of the lives of those living and working at the GRS Property and to the GRS Property itself"?

A: No, I do not agree. In my professional opinion to a reasonable degree of certainty, the access routes that allow fire department aerial apparatus to approach the structures are consistent

with the same layout that existed prior to the pipeline construction and are not materially different than what existed prior to the pipeline construction.

Q: In your experience as an emergency responder, is it often typical that an emergency response vehicle – like a fire truck or ambulance – has to access a property that has logistical, traffic, or other site constraints?

A: Yes. Access issues are not unique to garden apartment complexes and exist in many areas of a community.

Q: Is it common that an emergency responder has to navigate tight roadways or access areas to respond to an emergency?

A: Yes. Emergency responders are routinely familiar with those areas and locations within their community where access can be a challenge. For example, there are areas within the metropolitan region where emergency vehicles have to go down a single lane, one-way street with parking on both sides. Similarly, garden apartments and mid-rise structures often have large set-backs and soft grass areas that directly affect the placement and positioning of aerial apparatus, and require fire department use of ground ladders and extended hoseline operations.

Q: So, it is fair to say that even with roadways or driving lanes that may be narrow, or where a property is located on a dead end street, that emergency responders can and are still able to properly and safely respond to emergencies?

A: Yes. The key point is that is that the fire department is familiar with their first-due response area, have knowledge of the locations where access challenges may exist, and take steps to try to

mitigate these challenges, where possible. And, that has actually occurred here, as Middletown Township specifically reviewed the Glen Riddle Station Apartments, and Sunoco's construction work area, and provided recommendations on potential emergency response issues during the temporary construction activity that were accepted and addressed by Sunoco.

Q: Have you looked at the construction area, parking lot, and traffic patterns that are in place at the Glen Riddle Station Apartments, and evaluated them from the point of view of whether or not they presents any fire safety risks or hazards?

A: Yes, I have. As I previously noted I conducted an on-site review of the location of the sound barriers and the available road space on March 29, 2021. My evaluation included a review of the Google Earth maps of the pipeline right-of-way prior to the construction, conversations with Robert Drennen, Middletown Township Emergency Coordinator, and a review of Mr. Drennen's memorandum to the Middletown Township Manager on December 10, 2020 outlining his recommendations.

Q: In your professional opinion to a reasonable degree of certainty, does the construction of the ME2/2X pipelines at the Glen Riddle Station Apartments, including the temporary blocking of certain portions of the parking lot, traffic patterns, and pedestrian access, and general ingress and egress to the buildings and property present fire safety risks or hazards, or a risk to human life and safety?

A: No, the fire safety hazards that are present during the construction activity are consistent with those encountered at garden apartment complexes in general, and nothing about the

construction work has created a new or different hazard than the hazards that already pre-existed at the property.

Q: Are you aware whether there has been any emergency response calls to the Glen Riddle Station Apartments during the active construction of the ME2 pipelines at the property?

A: Yes, there has been at least two emergency response events during the active construction. The first was on December 12, 2020 at approximately 2:15 PM for an odor investigation. The second emergency response event was on January 17, 2021 at 6:09 PM for a fire investigation. Based on my review of the dispatch sheets (copies attached as **Exhibit SPLP GN-7**), and my conversations with Mr. Drennen, emergency responders were able to access the property and respond to the emergency events within their normal response times and without any access issues into the apartment complex.

Q: Have you reviewed a December 10, 2020 memo from Mr. Drennan that responded to Mr. Culp's December 8, 2020 letter that raised various concerns regarding fire safety at the Glen Riddle Apartments, which include many of the same concerns raised in his testimony in this case?

A: Yes, I reviewed both Mr. Drennan's December 10th memo and Mr. Culp's December 8th letter. I disagree with the concerns raised by Mr. Culp in his December 8th letter. Mr. Culp claims that there is an "increased risk in fire situations due to the restricted access caused by Sunoco", including a reduced cartway width and tight turning radius, and lack of a truck around space. Mr.

Culp also claims that he believes there is a risk of vehicle accidents and increased response time for an emergency.

I also reviewed Mr. Drennan's response and agree that the recommendations he made would further enhance fire safety at the Glen Riddle Apartments during the construction. Mr. Drennan recommended that given the width of the parking lot, certain parking spots be temporarily blocked off to allow fire apparatus to have enough space to back up and turn around and to expand the traffic pathway for emergencies. Mr. Drennan also explained that during an emergency, once the fire apparatus were in place, they would not need to pass each other for further emergency access, and that the emergency vehicles would be able to exit the property safely. Mr. Drennan noted that the response time for aerial fire apparatus (i.e. ladder trucks, etc.), would not be negatively impacted if these parking spots were blocked off, which could be easily accomplished by placing temporary "no parking" signs at the property.

I believe that the recommendations proposed by Mr. Drennen in his December 10th memorandum and since implemented have addressed the potential fire and safety hazards and access issues at the Glen Riddle Station Apartments, as demonstrated at the December 10th and January 17th emergency responses.

Q: Are all of the professional opinions that you provide in your testimony provided to a reasonable degree of certainty?

A: Yes.

Q: Do you wish to offer anything else?

A: I reserve the right to supplement my testimony based on Complainant's surrebuttal testimony.

SPLP EXHIBIT GN-1
PUBLIC EXHIBIT

Gregory G. Noll
GGN Technical Resources, LLC

CURRICULUM VITA

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Lancaster, PA 17603

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email: ggnoll@me.com

EDUCATION AND CERTIFICATIONS

Master of Public Administration, Iowa State University, Ames, IA, 1981.
Bachelor of Arts, Business Administration, Kutztown University of PA, Kutztown, PA, 1978.
Associate of Arts, Fire Science, Prince George's College, Largo, MD, 1976.

Certified Safety Professional (CSP) - Comprehensive Practice, Board of Certified Safety Professionals, Savoy, IL. Certification Number 11053, 1992.

Certified Emergency Manager (CEM). International Association of Emergency Managers, Falls Church, VA, 2012.

Fire Officer IV, Fire Fighter III, Fire Inspector III, Fire Instructor III, Hazardous Materials Technician and Hazardous Materials Incident Commander Certifications, National Board on Fire Service Professional Qualifications, Quincy, MA, 1994. Certification Numbers are F/O IV - 33455, F/F III - 1465, F/I III – 65876, F/I III - 28057, HMT - 7 and HMIC-33456.

Hazardous Materials Branch Officer Certification, International Fire Service Accreditation Congress. Certification Number 657163.

EMPLOYMENT HISTORY

Present – January 2016 — Principal, GGN Technical Resources, LLC, Lancaster, PA

The LLC provides emergency planning, response and incident management consulting services to public safety, government and private organizations. Current project focus is on hazardous materials emergency planning and response, incident / crisis management, and homeland security.

Present – January 2019 — Senior Planning Specialist – Special Projects, South Central PA Regional Task Force through PA Emergency Management Agency (PEMA) and the Dauphin County Dept. of Public Safety.

Coordinate regional all-hazard training activities funded through the U.S. DHS Homeland Security Grant Program and serve as the Team Leader of the All-Hazards Incident Management Team (AHIMT). Work on special projects and leadership issues as requested by the SCTF Program Manager.

January 2001 – January 2019	Program Manager and All-Hazards Incident Management Team (AAHIMT) Leader, South Central PA Regional Task Force through PA Emergency Management Agency (PEMA) and the Dauphin County Dept. of Public Safety. SCTF is one of nine regional task forces established by the Commonwealth of PA. SCTF is funded through the U.S. DHS Homeland Security Grant Program and focuses on region-based homeland security and emergency management issues that exceed local capabilities. As Program Manager, was responsible for the management of SCTF day-to-day activities, including oversight of 15 Planning Specialists and a network of 10 Subcommittees and related Working Groups.
October 2016 - May 1990	Senior Partner, Hildebrand and Noll Associates, Inc. Port Republic, MD Founded Hildebrand and Noll Associates (HNA) in 1990 with Michael S. Hildebrand. The consulting firm specialized in emergency planning, response and incident management consultation in three primary markets: petroleum, chemical, and defense industries.
May 1990 - July 1987	Hazardous Materials Coordinator, Prince George's County Fire Department, Landover Hills, MD Managed and coordinated the Department's Hazardous Materials Division, which included all planning, response and training activities. Served as the Community Emergency Coordinator for the Local Emergency Planning Committee (LEPC).
July 1987 - July 1981	Fire and Safety Specialist, Safety and Fire Protection, American Petroleum Institute, Washington, DC Provided support to the API Committee on Safety and Fire Protection and its related subcommittees. Coordinated a nationally recognized safety and fire protection engineering technical standards program that included more than 25 standards covering safe operating practices and fire protection design principles for petroleum and petrochemical facility operations. Areas of responsibility included providing regulatory analysis, providing technical support and information on fire, safety and hazardous materials issues, and serving as the API liaison to various fire safety and industry professional organizations (IAFC, ISFSI, NFPA, CMA, etc.).
June 1981 - February 1978	Fire Instructor, Iowa State University, Fire Service Institute, Ames, IA Developed and taught college-level fire science courses in the areas of Administration and Management, Hazardous Materials, and Strategic Planning for Fire Protection. Conducted firefighter

	training in various basic and advanced subject areas, including breathing apparatus, strategy and tactics, hazardous materials, and flammable liquid and gas firefighting.
February 1979 - Jan. 1977	Firefighter, Reading Fire Department, Reading, PA Career firefighter with responsibilities in fire suppression, fire prevention and emergency medical services.

VOLUNTEER AND PART TIME WORK EXPERIENCE

Present – June 2020	Member, National Academies of Sciences, Engineering & Medicine – Transportation Research Board (TRB), Committee for a Study on the Safe Transportation of Liquefied Natural Gas by Railroad Tank Car. Current study requested by Congress to review and inform government and industry decisions on the transport of LNG by rail.
Present – January 2000	Advisor, Lancaster County Hazardous Materials Response Team (Company 2-9), Lancaster, PA and Member, Lancaster County Local Emergency Planning Committee, Lancaster, PA
Present - February 1988	Award Committee Chairperson, Yvorra Leadership Development Foundation, Port Republic, MD A non-profit foundation promoting leadership development within the emergency services community. Since its inception in 1989, has awarded over $200,000 in scholarships.
Present – 1987	Adjunct Member, Hazardous Materials Committee, International Association of Fire Chiefs (IAFC), Fairfax, VA
December 2015 – October 2017	Member, National Academies of Sciences, Engineering & Medicine – Transportation Research Board (TRB), Committee for a Study of Domestic Transportation of Petroleum, Natural Gas and Ethanol. Resulted in the development of TRB Special Report 325 – Safety Transporting Hazardous Liquids and Gases in a Changing U.S. Energy Landscape.
October 2013 – March 1997	Hazardous Materials / WMD Manager, Pennsylvania Task Force 1 - Urban Search and Rescue Team (USAR), PA Emergency Management Agency, Harrisburg, PA Served as a Manager of the HazMat Specialist element of PA Task Force 1. Responsible for the management and direction of all Hazardous Materials Specialists. Responded to World Trade Center and Hurricane Katrina – Mississippi AOR as part of PATF-1.

November 2003 – July 2000	Co-Chairperson, Lancaster County Emergency Management Agency (LEMA) – Counter-Terrorism Subcommittee, Lancaster, PA
1995 - March 1992	Past-President, Pennsylvania Association of Hazardous Materials Technicians (PAHMT). PAHMT is a professional organization representing the interests of the PA hazardous materials response community.
Present - April 1981	Adjunct Faculty Member, National Fire Academy, Emmitsburg, MD Serve as an adjunct instructor for various courses in the resident and field hazardous materials and terrorism curriculum.
August 1990 - May 1989	Short Term Appointee, Argonne National Laboratory, Energy and Environmental Systems Division, Argonne, IL Worked on various projects directly with the U.S. Department of Transportation, Research and Special Programs Administration (RSPA), Washington, DC.
December 1988 - Sept. 1984	Adjunct Faculty Member - Fire Science Curriculum, Montgomery College, Rockville, MD
December 1987 - June 1981	Firefighter and Fire Officer, Berwyn Heights Volunteer Fire Department, Berwyn Heights, MD
July 1987 - June 1983	Hazardous Materials Technician and Shift Officer, Prince George's County Fire Department, Hazardous Materials Response Team, Landover Hills, MD
January 1977 - Sept. 1970	Volunteer Firefighter and Fire Officer, Reading Fire Department, Reading, PA

MILITARY EXPERIENCE

August 2012 - February 1972	Retired as SMSgt (IMA), assigned to the Air Force Civil Engineering Center – Headquarters, Fire & Emergency Services (AFCEC/CEXF), Tyndall Air Force Base, FL. Total active military service (Active Duty, U. S. Air Force Reserve, PA ANG and IA ANG) = 29 years. Possessed a TS/SCI security clearance.

CODES AND STANDARDS COMMITTEES

Present - 1986	Member and Past Chairperson, Technical Committee on Hazardous Materials Emergency Response (NFPA 470) - National Fire Protection Association (NFPA), Quincy, MA.

Present – October 2005	Member and Past Co-Chair – State and Local Government, The Interagency Board for Emergency Preparedness and Response (IAB) - Training and Exercise Subgroup. The IAB is designed to establish and coordinate local, state and federal standardization, interoperability, and responder health and safety to prepare for, train and respond to, mitigate and recover from any incident by identifying the requirements for an all-hazards incident response, with an emphasis upon CBRNE issues.
Present – August 2014 2003 - 1997	Member, Pennsylvania Fire Service Certification Advisory Committee, Lewistown, PA

MAJOR TEXTS AND PUBLISHED ARTICLES

1. *Hazardous Materials: Managing the Incident* (4th edition), by Gregory G. Noll and Michael S. Hildebrand, Burlington, MA: Jones & Bartlett (2014).

2. *Pipeline Emergencies (3rd edition)*. Michael S. Hildebrand and Gregory G. Noll, Washington, DC: U.S. Department of Transportation and National Association of State Fire Marshals (2017).

3. *Storage Tank Emergencies - Guidelines and Procedures (2nd edition),* by Michael S. Hildebrand and Gregory G. Noll, Burlington, MA: Jones & Bartlett (2017).

4. *Handling Gasoline Tank Truck Emergencies (4th edition),* by Michael S. Hildebrand and Gregory G. Noll, Burlington, MA: Jones & Bartlett (2016).

5. *Hazardous Materials Emergencies Involving Intermodal Containers: Guidelines and Procedures (2nd edition)*, by Gregory G. Noll, Michael S. Hildebrand and Michael L. Donahue, Burlington, MA: Jones & Bartlett (2017).

6. *Propane Emergencies (3rd edition)*. Michael S. Hildebrand and Gregory G. Noll, Lisle, IL: National Propane Gas Association (2006).

7. *Special Operations for Terrorism and Hazmat Crimes*. Chris Hawley, Gregory G. Noll and Michael S. Hildebrand. Chester, MD: Red Hat Publishing, Inc. (2002).

8. *Hazardous Materials for Fire and Explosion Investigators*, Michael S. Hildebrand, Gregory G. Noll and William Hand, Stillwater, OK: Fire Protection Publications (1998).

9. *The Fire Chief's Handbook (6th edition)*, edited by Thomas Brennan and Joseph Bachelor, Saddle Brook, NJ: Fire Engineering (2003). Authored chapter on Hazardous Materials Operations.

10. *Fire Protection Handbook (20th Edition)*, edited by the National Fire Protection Association, Quincy, MA: NFPA (2008). Co-authored chapter on Hazardous Materials Emergencies.

11. Author of approximately fifty articles on various topics pertaining to hazardous materials response, personnel protective clothing, flammable liquids, and firefighting foams. Articles have been published in various fire service professional journals, including *Fire Engineering*,

The International Fire Chief, *Industrial Fire Safety*, and *Fire Chief*. Currently serve as a member of the Editorial Advisory Board of *Fire Engineering* magazine and on the Conference Planning Committee for the Fire Department Instructor's Conference (FDIC).

SPECIAL AWARDS, CITATIONS AND CERTIFICATES OF APPRECIATION

1. South Central (PA) Task Force received the following awards under the Program Management of Gregory Noll for its efforts in establishing a regional counter-terrorism planning and response capability:

    - International Association of Emergency Management (IAEM) 2006 Interagency Disaster Preparedness Award
    - U.S. Environmental Protection Agency Region 3 Partnership Award
    - Mid-Atlantic Regional All-Hazards Forum 2006 Regional Readiness Achievement Award.

2. National Fire Heritage Center, Hall of Legends, Legacies and Leaders – Inducted into the Fire Service "Hall of Fame" Class of 2019 for leadership and contributions to the fire service and the hazardous materials emergency response community (April 2019).

3. Texas Hot Zone Conference 2017 – Dieter J. Heinz Instructor of the Year Award (October 2017).

4. U.S. Air Force, Air Force Civil Engineer Center – 2012 Air Force Outstanding Civil Engineer Manager of the Year - Runner-Up (January 2013).

5. International Association of Fire Chiefs – Hazardous Materials Committee. John M. Eversole Lifetime Achievement Award for leadership and contributions to further and enhance the hazardous materials emergency response profession (May 2011).

6. Pennsylvania Catholic War Veterans - 2011 Catholic Veteran of the Year Award in recognition of outstanding service to country, state and community (June 2011)

7. California Continuing Challenge Hazardous Materials Conference – recipient of the William Patterson Lifetime Achievement Award for leadership and significant contributions to the hazardous materials emergency response and training community (September, 2010).

8. Texas Hot Zone Conference 2009 – "In the Zone Award" for contributions and commitment to responder health and safety through training and education (October, 2009).

9. International Association of Fire Chiefs – Hazardous Materials Committee. Level A award for lifetime contributions to the hazardous materials emergency response and education community (2006).

10. PA District 23 Little League Baseball, Hometown Hero Award for Operations at the World Trade Center – September 11th – 19th, 2001 (September 15, 2002).

11. City of Harrisburg, PA. Mayor's Award for Valor for Operations at the World Trade Center – September 11th – 19th, 2001 (October10, 2001).

12. Pennsylvania Association of Hazardous Materials Technicians. Award of Appreciation for serving as the First PAHMT President (October, 1995).

13. Keystone Chapter of the International Society of Fire Service Instructors. Keystone Educator of the Year - 1994. Awarded for commitment, dedication and performance in training and education of Pennsylvania emergency response personnel.

14. Prince George's County Fire Department, Hazardous Material Response Team, Landover Hills, MD. Plaque of recognition and appreciation from Prince George's County for service as the PGFD Hazardous Materials Coordinator (May, 1990).

15. Prince George's County Fire Department, Hazardous Material Response Team, Landover Hills, MD. Recipient of PGFD Unit Citation for continued excellence in the field of hazardous materials training and response (April, 1990).

16. Prince George's County Fire Department, Hazardous Material Response Team, Landover Hills, MD. Recipient of National Association of Counties Award for Excellence for development of a PGFD HMRT program for the handling and treatment of chemically contaminated individuals (September, 1989).

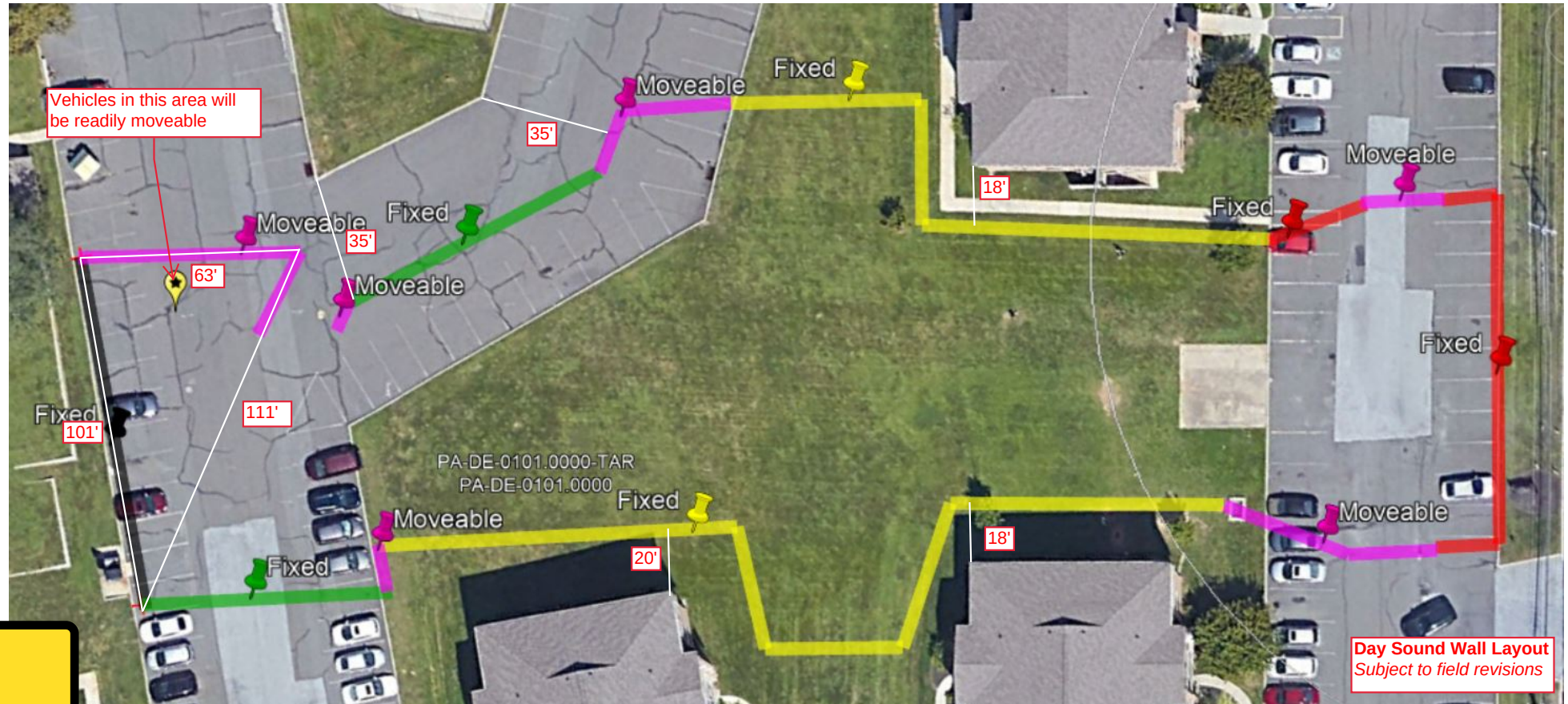
17. Eastern Division of the International Association of Fire Chiefs. Scholarship Recipient (1978).

18. International Association of Fire Chiefs, Washington, DC. Scholarship Recipient (1977).

19. PA Air National Guard, Middletown, PA. Firefighter of the Year - 1976.

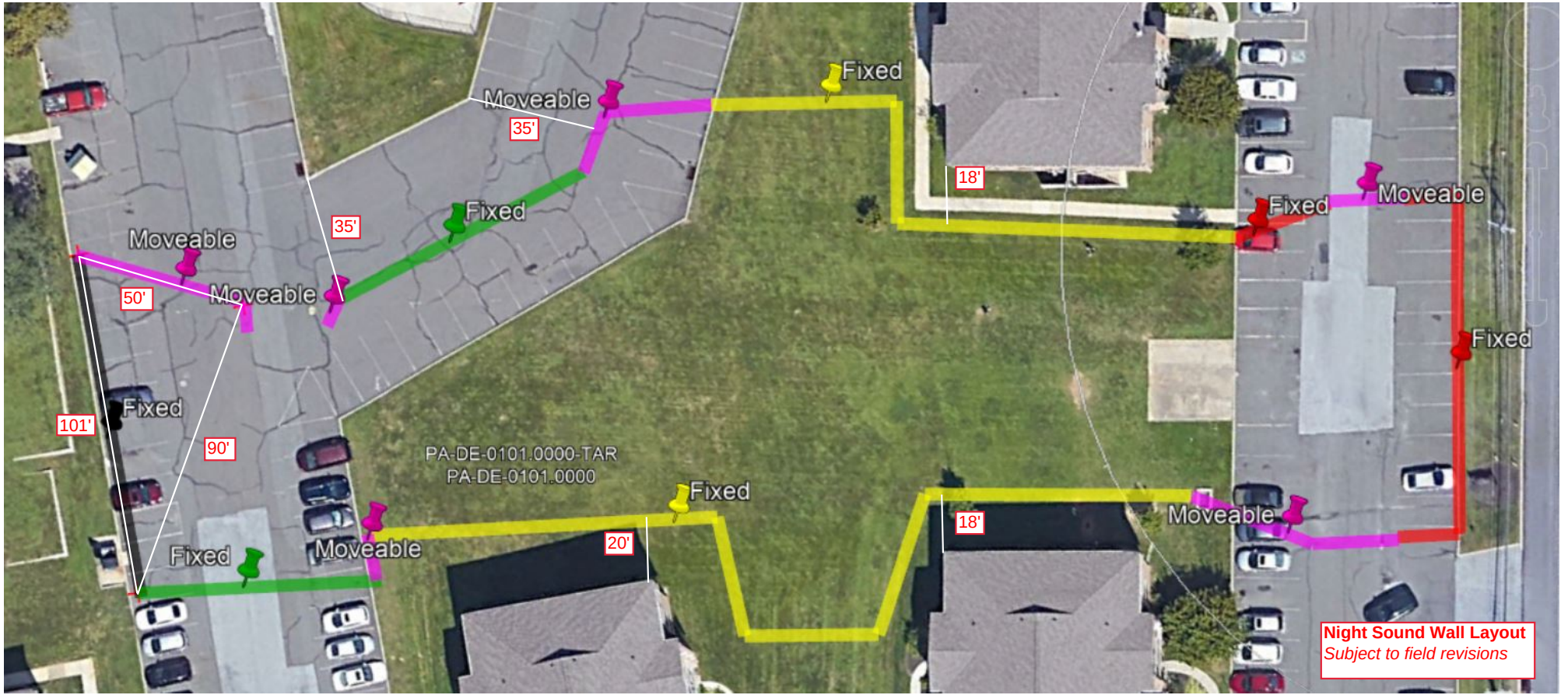
(12/20)

SPLP EXHIBIT GN-2 - PUBLIC EXHIBIT



GN-2

7/7/2021 LS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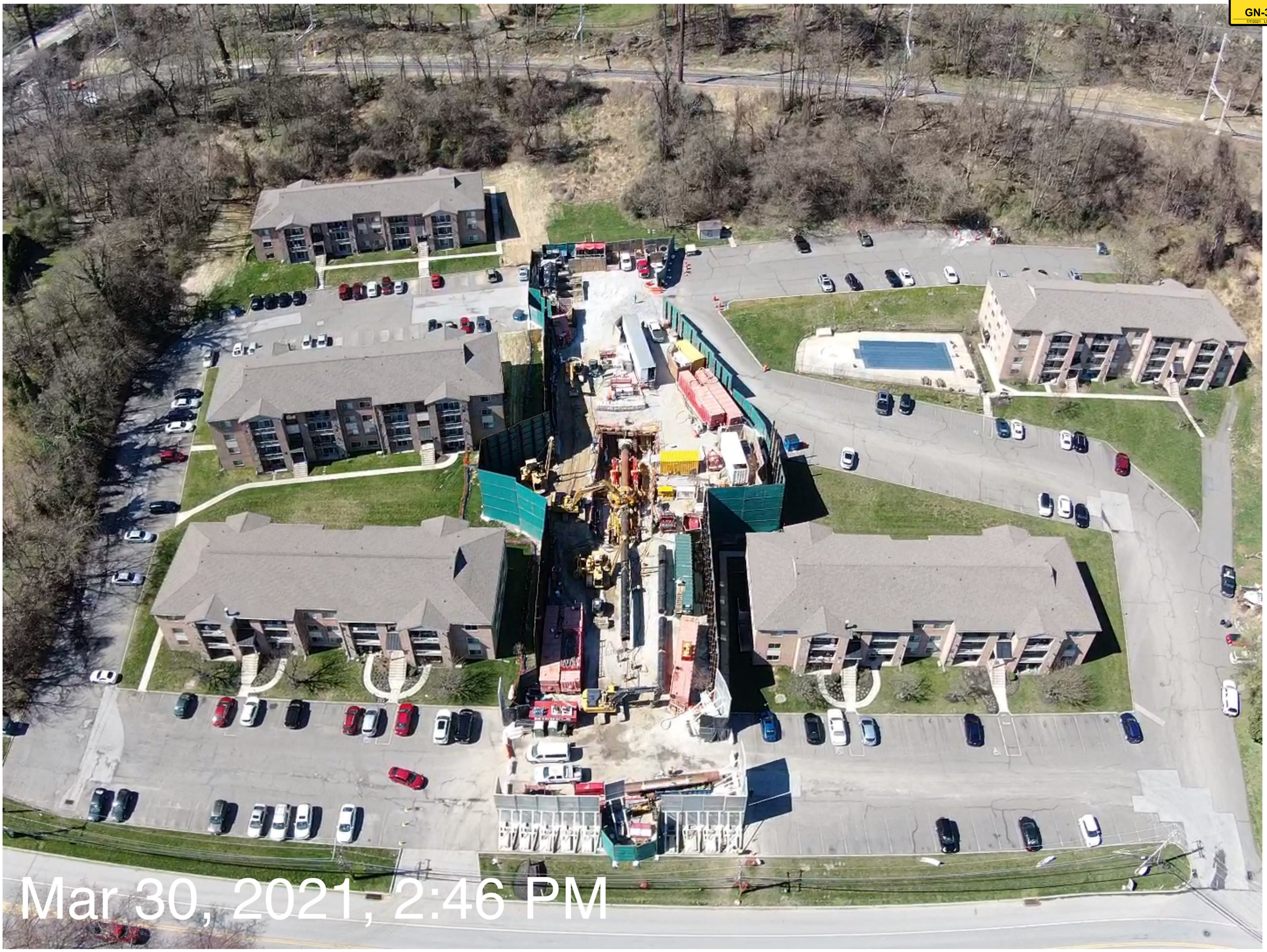
Subject to field revisions

SPLP EXHIBIT GN-3 - PUBLIC EXHIBIT

GN-3
7/7/2021 LB



SPLP EXHIBIT GN-4 - PUBLIC EXHIBIT

GN-4
7/7/2021 LS

SPLP EXHIBIT GN-5
PUBLIC EXHIBIT

UZMAN
ENGINEERING

December 8, 2020

Steve Iacobucci
Raymond Iacobucci Communities
Glen Riddle Station Apts.

RE: Review of Middletown Township Fire Safety Response Letter Dated Dec 4th, 2020

Mr. Iacobucci:

Per your request Uzman Engineering has reviewed the above mentioned Response letter provided by township solicitor James R Flandreau of Paul, Flandreau and Berger, LLP. This letter was a summary of the fire safety concerns expressed by Uzman and Glen Riddle representatives prompting the site walk and fire truck access trial run described in said letter.

The letter summarizes the results of the site meeting from December 1st with township representatives, Glen Riddle representatives and their experts (Uzman) as well as Sunoco and their representatives including Michels (the contractor) and the land use representatives. This letter indicates that the vast majority of the bullet point items were satisfactorily reviewed, addressed and the township is comfortable with the concerns moving forward. UE understands that this is the township's experts opinions.

The synopsis of the meeting and conclusions presented are that the impact of the pipeline work will impact the normal and expected use of the development but that so long as a bare minimum of provisions are made that the emergency use and normal use shall not be significantly impacted. It is UE's opinion that the temporary work shall have a negative impact both in violation of the township ordinances as well as the adopted Code, particularly the International Fire Code (IFC).

UE provides the following comments in response to memo and in relation to the work as a whole:

1. Township ordinance site planning requires communities of this size to have either two entrances or means of egress or a means of a turnaround or cul de sac if said community roadway is less than 500 feet in length (Section 210-26-G). In fact Glen Riddle will be bisected by Sunoco in to two roadways which will exceed 500 feet in length serving much greater than 10 dwelling units which Sunoco's work as approved by the township would prohibit the

GN-5
7/7/2021 LS

use of dead end roads regardless if furnished with a cul de sac or not. Further the dead end being formed will not function as a temporary turn around area as no cul de sac or adequate turn around area is being provided by Sunoco or available. Further, portions of the roadway will be impacted reducing the width to much less than the minimum cartway width. This will require one way traffic only which (although is prohibited regardless) will require Sunoco to provide signage, proper sight of oncoming traffic etc. All conditions which are not permitted in the ordinances and in general not good practice for traffic planning purposes.

2. In addition to the normal traffic considerations there is an increased risk in fire situations due to the restricted access caused by Sunoco including but not limited to:
    a. Restricted cartway width below the township requirement minimum. This is particularly impactful where this section is along a tight turning radius.
    b. Lack of turn around space that would normally be served with a fire access lane or adequate turn around distance as per the IFCs This generally is the genesis of the prohibition of dead end roads and/or requirement for fire access lanes in communities that primarily function as a cul de sac. In practice cul de sacs and turn arounds are traditionally accepted for normal traffic so long as secondary means of access via emergency access lane is provided. This is imperative so that fire apparatus can pass by one another for emergency access. The condition is exacerbated at this located due to the one lane access portion where trucks will have to back out through this section with steep grades tight turns etc.
3. The fire safety and lack of normal access pose additional risks both minor (risk of vehicle accidents from lack of turn around, one way road etc.) and major (increased response time and lack of full normal access around buildings for life safety reasons). UE understands that the township letter feels the impact is acceptable and that emergency personnel will still be able to access the site however there is a clear negative impact posed by the pipeline construction. The degree that this negatively impacts response time, availability of life safety access, increased maintenance and increased risk for typical vehicle accidents is impossible to quantify but the normal expected access and use of the site will be impacted.
4. The impact of any snow removal required is so far unknown. UE raised this point following the initial layout of the sound walls. Given the site constraints snow will likely require haul away removal from this location. No provisions were provided in the construction plans for situations that may require temporary removal or moving of the sound panels to aid in

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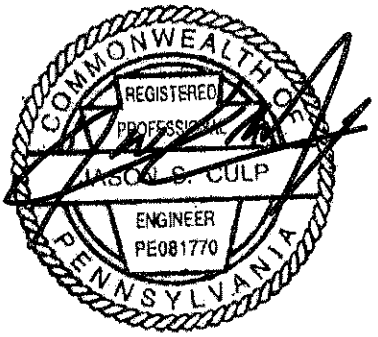
snow removal. As this pinch-point is the only access it is imperative that provisions be incorporated for removal in maintenance situations such as these.

The above comments are offered for response from the township. UE was asked to evaluate the conditions relative to the life safety and for the resident impacts.

Please contact the undersigned should additional questions or concerns arise.

Sincerely,

Jason Culp, P.E.
Vice President
jason@uzmanengineering.com



SPLP EXHIBIT GN-6
PUBLIC EXHIBIT

MEMORANDUM

Middletown Township

TO: John McMullan, Township Manager
CC: James Flandreau, Meredith Merino, Eric Janetka
FROM: Bob Drennen, Emergency Management Coordinator
DATE: December 10, 2020
SUBJECT: GLEN RIDDLE APARTMENTS

After reviewing Mr. Culps's letter, I have developed several recommendations for issues identified in his letter. As stated in Mr. Culp's letter, "The condition is exacerbated at this location.....where trucks will have to back out through the section (pathway) with steep grades tight turns etc." is an issue as identified by Mr. Culp. With the width of the parking lot, I would recommend to block off 2 parking spots on the north side upper parking lot, 4 parking spots on the south side upper lot, to permit the apparatus to back up into these stalls and turn around. With the pathway being expanded by 6 feet, there are 3 parking spot on the middle level parking lot, north side that should be blocked off. (total 9 parking spots; upper and middle lots -- see attached site plan)

The access pathway has been expanded. Apparatus would respond from Glen Riddle Road up the driveway, so once placed for operational purposes, there would be no need for apparatus to "pass one another for emergency access" as Mr. Culp states in his letter. When the incident is under control, a safety officer will guide apparatus to back into the additional parking stalls, then drive down the pathway and exit the property, using their emergency lights to draw attention to other civilian drivers in the complex for them to stop and drive safely.

Also, with the pathway being expanded in width, the response time for an aerial apparatus with the blocking off of parking spots in proximity to the pathway would not negatively impact on response time. This is obviously very critical in terms of life safety for the apparatus to respond up the hill in a timely fashion. This had been initially discussed and recommended as a critical factor for the Management of Glen Riddle Apartments to block these spots and it is recommended to post temporary signage on the pathway stating, "No Parking Fire Lane."

From an operational perspective, two aerial apparatus are dispatched immediately upon notification to County dispatch center. IF additional aerial devices or IF a 2nd alarm would be required, placement of aerial apparatus would not be impacted for life safety with the width of the pathway and the width of the parking lots. Again, when the incident is under control, having the additional parking spots for the apparatus to turn around and leave is critical for safe driving practices.

Bob Drennen

Bob Drennen M.S., M.Ed., CFPS, CFI
Emergency Management Coordinator | Middletown Township

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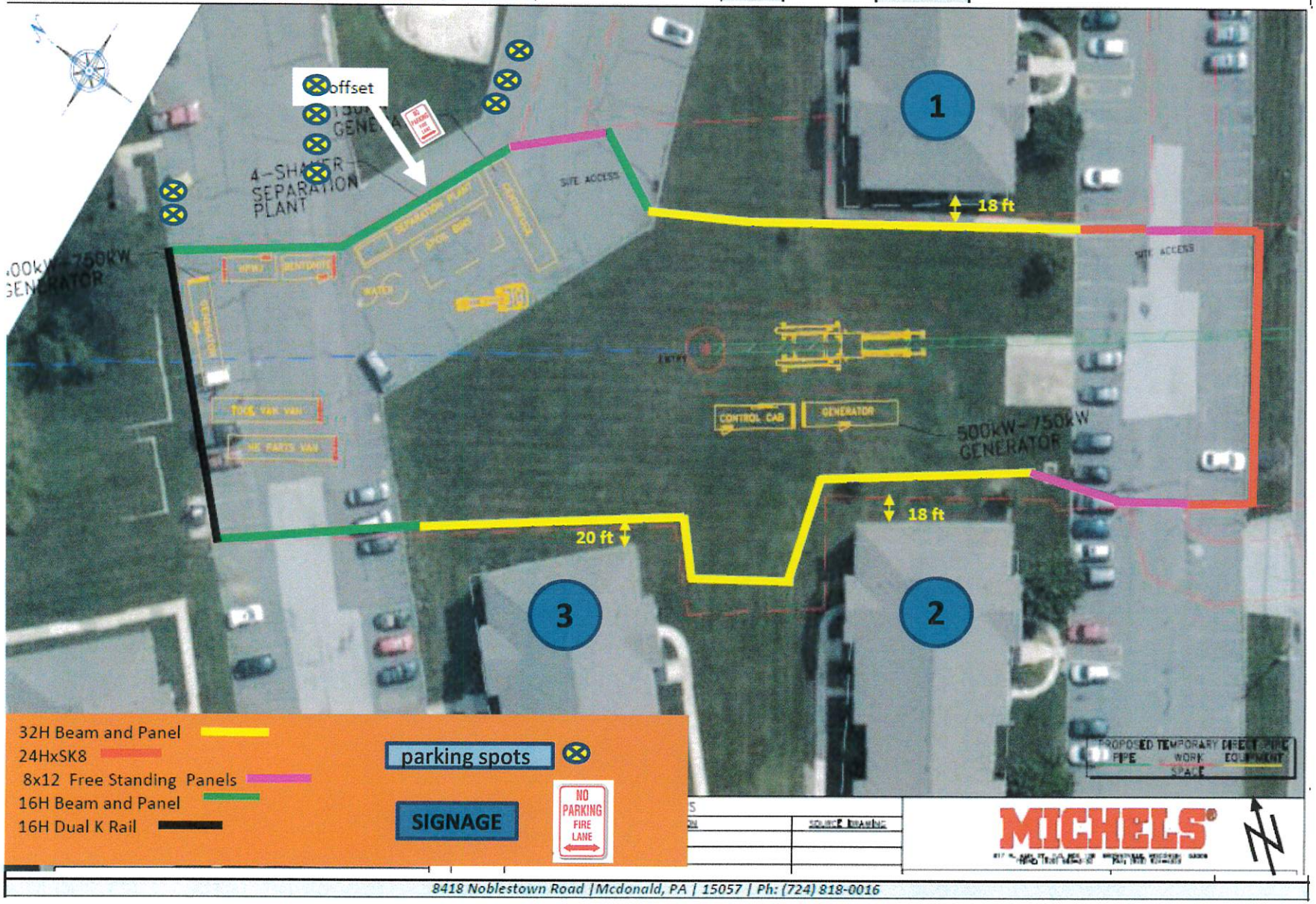
Behrens and Associates, Inc.	PROJECT SITE OVERVIEW					
Environmental Noise Control	Customer	Energy Transfer			Location (GPS)	Glen Riddle Station South
DRAFT EQUIPMENT LAY OUT SUBJECT TO FIELD REVISIONS	Date	12/8/2020	Rev.	--		39.896230-75.433482



8418 Noblestown Road |Mcdonald, PA | 15057 | Ph: (724) 818-0016

SPLP EXHIBIT GN-7
PUBLIC EXHIBIT

Company 50 | Middletown Fire Company No. 1	01/17/2021	18:09:49	F21003517 beat: rr2 ll: 39.89557 -75.43330 disp: tr46,ta46,sd50
Company 50 | Middletown Fire Company No. 1	01/17/2021	18:09:48	**275 GLEN RIDDLE RD, Middletown Township** @GLEN RIDDLE STATION APTS Apt/Suite: J1 X1: Martins Ln X2: Pennsgrove Ct Nature: FIRE-BLD BUILDING FIRE, INVESTIGATION Time: 18:08:44
Company 46 | Rocky Run Fire Company	01/17/2021	18:09:44	F21003517 beat: rr2 ll: 39.89557 -75.43330 disp: tr46,ta46,sd50
Company 46 | Rocky Run Fire Company	01/17/2021	18:09:43	**275 GLEN RIDDLE RD, Middletown Township** @GLEN RIDDLE STATION APTS Apt/Suite: J1 X1: Martins Ln X2: Pennsgrove Ct Nature: FIRE-BLD BUILDING FIRE, INVESTIGATION Time: 18:08:44

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Company 50 | Middletown Fire Company No. 1	12/12/2020 14:15:50	Feels sick / ref ems no odor but wants fd to check it out inc: f20073611 beat: rr2 ll: 39.89557 -75.43330 disp: ta46,amb104,mic104,ch46,fd50
Company 50 | Middletown Fire Company No. 1	12/12/2020 14:15:48	**275 GLEN RIDDLE RD, Middletown Township** @GLEN RIDDLE STATION APTS X1: Martins Ln X2: Pennsgrove Ct Nature: FIRE-OTH FD INVESTIGATION Time: 14:11:58
Medic 104 | RMH Supervisor Chase Car	12/12/2020 14:14:36	Feels sick / ref ems no odor but wants fd to check it out inc: f20073611 beat: rr2 ll: 39.89557 -75.43330 disp: ta46,amb104,mic104
Medic 104 | RMH Supervisor Chase Car Capcode: 1040017 ☆ Login to manage favorite stations	12/12/2020 14:14:34	**275 GLEN RIDDLE RD, Middletown Township** @GLEN RIDDLE STATION APTS X1: Martins Ln X2: Pennsgrove Ct Nature: FIRE-OTH FD INVESTIGATION Time: 14:11:58
Company 46 | Rocky Run Fire Company	12/12/2020 14:13:04	Feels sick / ref ems no odor but wants fd to check it out inc: f20073611 beat: rr2 ll: 39.89557 -75.43330 disp: ta46
Company 46 | Rocky Run Fire Company Capcode: 0461008 ☆ Login to manage favorite stations	12/12/2020 14:13:03	**275 GLEN RIDDLE RD, Middletown Township** @GLEN RIDDLE STATION APTS X1: Martins Ln X2: Pennsgrove Ct Nature: FIRE-OTH FD INVESTIGATION Time: 14:11:58