The INGAA Foundation, Inc.

2014

Current Practices for Communicating with Emergency Responders

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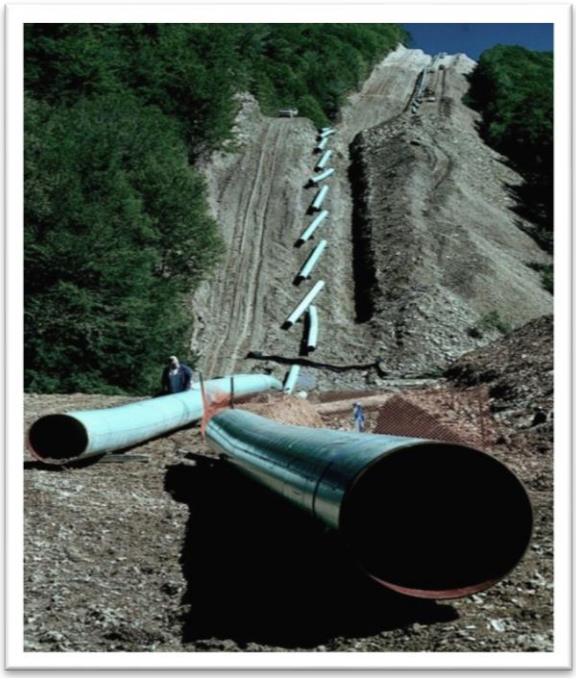
INGAA Foundation Report: 2014.2

July 2014

NIXON & ASSOCIATES



Legal Notice

This paper was authored by The INGAA Foundation Inc. and Nixon & Associates in coordination with INGAA's Integrity Management Continuous Improvement 7B team and the INGAA Communication Committee's Public Awareness subcommittee. The research and background materials for this paper were made available through the INGAA Foundation and its members.

We would like to thank the people who contributed to this paper and our research endeavors, as we all work towards enhancing public awareness and pipeline safety efforts.

Disclaimer

This report's findings are general in nature, and readers are reminded to perform due diligence in applying these findings to their specific needs, as it is not possible for the authors or sponsors to have sufficient understanding of any specific situation to ensure applicability of the findings in all cases. The authors and the sponsors assume no liability for how readers may use, interpret, or apply the information, analysis, templates, and guidance herein.

This report was developed to provide guidance to INGAA members and/or interstate natural gas pipeline operators. Members of the larger pipeline industry also may find value in this report.

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Executive Summary

The Challenge

In light of significant events in the natural gas pipeline industry, the Interstate Natural Gas Association of America, the INGAA Foundation and its members have seen the necessity for more effective communication and interaction with emergency response personnel. A 2011 INGAA filing with the Department of Transportation states that "while rare, pipeline incidents can have tragic consequences, including loss of life, injury or damage to property. Preventing incidents is the priority, but the importance of incident response, both planning and execution, and incident mitigation management (IMM) is self-evident." There is no stakeholder more important in the planning and execution stages of public awareness and engagement programs than emergency responders. The hope is that through actively engaging the emergency response community, we can significantly improve emergency response. Emergency responders who are more familiar with pipeline operations and knowledgeable of response protocols to a pipeline emergency are better prepared to protect their communities, and, in turn, minimize the impact of an incident. Further, emergency responders who are cognizant of outside-force damage prevention (including 811, call before you dig) can serve as safety allies.

Engaging emergency responders is a challenging and important responsibility that pipeline companies face. Effective two-way communication to build and maintain relationships with emergency responders is an important goal for pipeline companies. So how do we develop a more robust working relationship? The industry continues to listen to what emergency responders are saying and is taking action to develop joint solutions with the emergency response community. One way to do this is to take the industry's current practices and recommendations and incorporate them into company Incident Mitigation Management (IMM) plans. The purpose of IMM plans is to identify and take action to improve response and mitigation after an incident to minimize its impact, both in consequence and duration.

In order to achieve this goal of improved communication and coordination, pipeline companies must examine and learn from what has worked best for our peer pipeline operators and listen to what emergency responders are telling us. At the local level, pipeline operators should continue to take steps to observe the needs of public-sector first responders in their areas and tailor initiatives to meet those needs. By developing, practicing and effectively executing Incident Mitigation Management plans (IMM), pipeline companies better position themselves to prepare for and respond to emergency situations. By working together on a local level to acquaint responders with operators' definitions of High Consequence Areas (HCAs) and identify other potential areas of consequence concern like critical infrastructure, emergency responders and company personnel become partners for pipeline safety in communities where they jointly live and operate.

Introduction

The Interstate Natural Gas Association of America (INGAA) is a trade association representing approximately two-thirds of the pipelines and over 65 percent of the mileage comprising the United States' natural gas transmission pipeline system. INGAA's 26 member companies operate approximately 200,000 miles of interstate transmission pipelines, delivering one-quarter of the nation's energy. For INGAA and its members, pipeline safety is a core value. In December 2010, INGAA's board of directors established a board-level task force to pursue further improvements in safety performance and to increase public confidence in the natural gas pipeline infrastructure. In March 2011, INGAA's board of directors adopted its "Five Guiding Principles for Pipeline Safety."

One of the "Five Guiding Principles for Pipeline Safety" is to engage stakeholders from the local community to the national level to help them understand their role in pipeline safety and participate in reducing risk and responding in the unlikely event of a pipeline emergency. One of the most critical of these stakeholders is the emergency response community. In order to more effectively respond to pipeline incidents, INGAA and its member companies have studied industry current practices and are making suggestions to improve communication with public sector first responders.

While pipeline incidents are low frequency, they can have high consequences. We as an industry understand and recognize the importance of preparing and communicating with emergency responders. Recent regulations and associated guidance documents, most specifically the American Petroleum Institute's Recommended Practice 1162 (RP1162) V1, have addressed the need for operating companies to increase their public awareness efforts.

Communicating with First Responders

Understanding Our Audience

In order to effectively communicate with emergency responders, operating companies need to understand the distinct differences between a full-time, paid firefighter and a volunteer firefighter.

One important thing to remember is that because of the nature of volunteer staffing, training opportunities for volunteer departments usually occur at night or on weekends, not during typical work-day hours. Further, paid fire departments typically have access to more training resources and have the ability to provide training during shifts, providing for more content to be passed along to the firefighters. In many cases, paid fire departments also have a full-time designated training officer that can develop and deliver comprehensive training programs. In contrast, volunteer firefighters have more limited time and resources available for training.

Pipeline operators must determine the emergency response community's general understanding of pipelines and best methods for responding to pipeline incidents if it is to improve its quality of communications with the first responder. To complete this objective, emergency responders were informally surveyed during two 2011 conferences. The first survey for emergency responders was taken in September 2011 at the "Energy Emergencies Workshop" in Houston, Texas. (See Appendix B) Responses to the survey indicated that emergency responders overwhelmingly support including pipelines as a part of overall Hazardous Materials (HAZMAT) training, and emergency responders prefer face-to-face communication over other methods.

The second survey referenced in this paper was conducted at the Hotzone Conference in October 2011. (See Appendix C) Feedback from this survey indicated that more than 95 percent of the attending respondents believe the energy industry should support and encourage pipelines being included as part of HAZMAT training. Nearly three quarters of the emergency responders surveyed believe that the pipeline industry as a whole needs more internal Incident Command System (ICS) training to better dovetail company responses with emergency responders. Of the participants that answered, nearly 57 percent said they had met, or were familiar with their local pipeline representatives. Nearly half of emergency responders surveyed indicated that they did not feel the industry provided them with the information and resources they needed to successfully respond to a pipeline incident. This statistic references the group we, as an industry, need to target to build better relationships and enhance communication.

The natural gas transmission industry and INGAA in particular, made a successful push to get the Department of Transportation to edit the Emergency Response Guidebook (ERG) section on natural gas to more effectively communicate some of natural gas pipelines' properties with

emergency responders. The new ERG was released in the first quarter of 2012 and includes a revised section on responding to pipeline emergencies. The ERG is the primary reference used by first responders in the early stages of a HAZMAT incident and is distributed to emergency responders free of charge. The 2008 version of the ERG was the first to include information on pipeline safety and emergency response.

Communicating effectively with emergency responders is a constantly evolving process. As technology and the industry change, operators must adapt their efforts to improve coordination with this critical stakeholder group. First and foremost, it is crucial that operators demonstrate safety as a core value and not merely a priority. Priorities can change on a day-to-day basis, but values are unwavering. To demonstrate this, pipeline operators must develop relationships with local emergency response officials. By developing relationships and a level of trust with these important stakeholders, partnerships will develop and response to emergencies will be more efficient and effective.

Current Practices

At present, the industry's primary communication with emergency responders is accomplished with annual mailings and periodic face-to-face meetings with appropriate emergency response personnel. Many companies have joined collaborative programs at the state and national levels to engage emergency responders, as referenced in API's RP 1162. These collaborative programs, such as those offered by Paradigm and formerly The Pipeline Group, provide a forum for several pipeline operators to provide emergency responders with training for pipeline emergencies and to allow for two-way communication and information exchange.

In addition to these meetings, some operators provide facility tours, conduct joint tabletop drills and full-scale emergency exercises with emergency response agencies. Facility tours are an effective way for the emergency response community to see firsthand how pipelines work and to liaise with local field personnel. Tabletop and full-scale emergency drills provide opportunities for operating companies and local fire departments to test their knowledge and emergency response capabilities.

The natural gas transmission pipeline industry gradually has become more technologically progressive and is pursuing alternative means of communication. Some operators have received positive feedback from emergency responders on semi-annual or quarterly electronic newsletters. The National Association of State Fire Marshal's, with support from PHMSA, developed "Pipeline Emergencies." This free training tool for emergency responders is available online at www.pipelineemergencies.com as well as in print and DVD formats.

Operators have used these materials to develop online portals to train emergency responders. The National Association of State Fire Marshals' (NASFM) and Shell Pipeline Company LP's developed a Blackboard-based training system. The platform also sends registered emergency responders notifications on upcoming meetings with operators in their areas and communicate real-time in an actual emergency. The platform is being modified for industry use. Enbridge and Vector Pipeline have developed a 9-1-1 dispatch center specific online module. The program includes a four-hour certification program and scenarios available at mypiplinetraining.com. Paradigm Liaison Services LLC is also developing a customized state by state portal.

What Emergency Responders Said

In working toward establishing current practices for communicating with emergency response personnel, INGAA conducted several informal surveys, including at the Hotzone Conference in Houston, October 20-22, 2011. The purpose of this INGAA-sponsored survey was to measure how much, or how little, emergency responders knew about pipeline emergency response, and their general opinions of the industry's efforts to communicate and provide them with the information they needed to successfully respond to pipeline incidents.

The survey consisted of 13 questions with eight multiple choice questions and four short-answer questions. (Please see appendix C for questions and responses.) An INGAA booth was set up at the conference, and during that time, emergency responders were invited in to complete the surveys. In total there were 151 respondents with a wide variety of emergency response backgrounds, and varying years of service. The most common job titles were: HAZMAT Coordinator, Emergency Manager, HAZMAT Technician, Firefighter, and Captain. Geographically speaking, most of the respondents were from Texas, Arkansas, Louisiana, Georgia and Colorado.

Although not a statistically valid survey of all emergency responders, the survey nonetheless provided some useful information to help natural gas transmission operators improve their coordination with emergency responders.

Hotzone Conference Survey Key Findings

According to Hotzone survey respondents, 51 percent said they had received information in the mail from a pipeline company. This suggests that about half of this critical stakeholder group had not received, or did not remember receiving, communication from operating companies. Still 65 percent of respondents (97 total) indicated that they know what to do in the event of a

pipeline emergency *(Figure 1).* Some 35 percent of respondents (53 total) did not know, or were unsure, how to respond to a gas pipeline emergency. These results indicate there is significant room for improved communication and training.

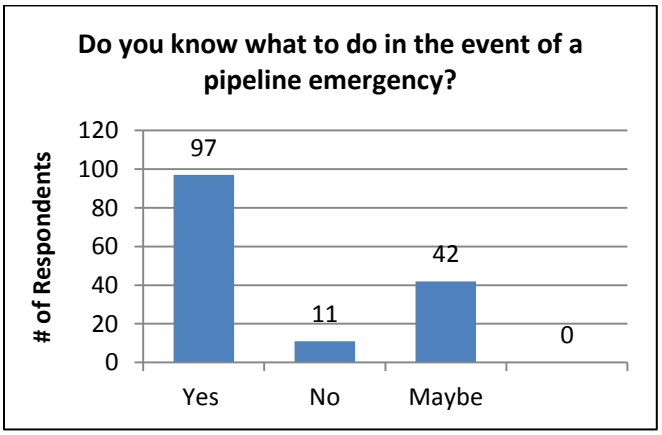

Figure 1

One of the key findings of the multiple choice section of the survey was that more than 95 percent of the respondents believed the industry should support and press for pipelines inclusion in HAZMAT Training *(Figure 2).* Emergency responders undergo many different training sessions on an annual basis, and said they would find it educationally beneficial to learn about pipelines as part of their HAZMAT Training course.

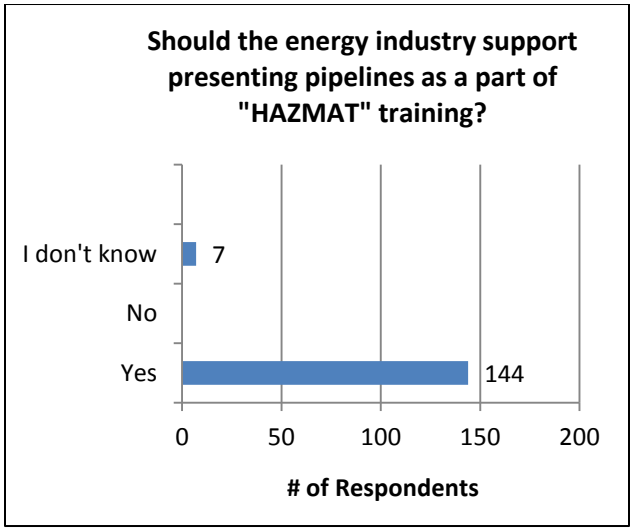

Figure 2

Nearly three quarters of the emergency responders surveyed believed that the industry as a whole needed more internal Incident Command System (ICS) training to better united company responses with emergency responders *(Figure 3).*

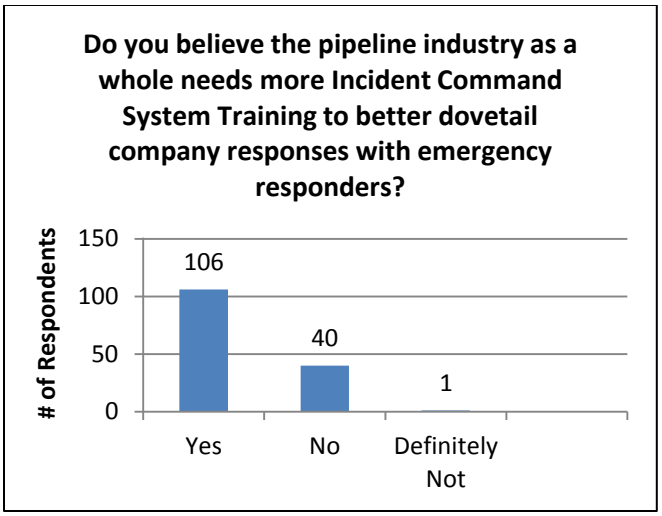

Figure 3

The short answer questions were written to allow emergency response personnel to provide their insights on what the industry can do to better communicate with them. A large number of the respondents stated a preference for more joint training sessions with their local pipeline representatives, and annual face-to-face contact with local personnel before an emergency occurs.

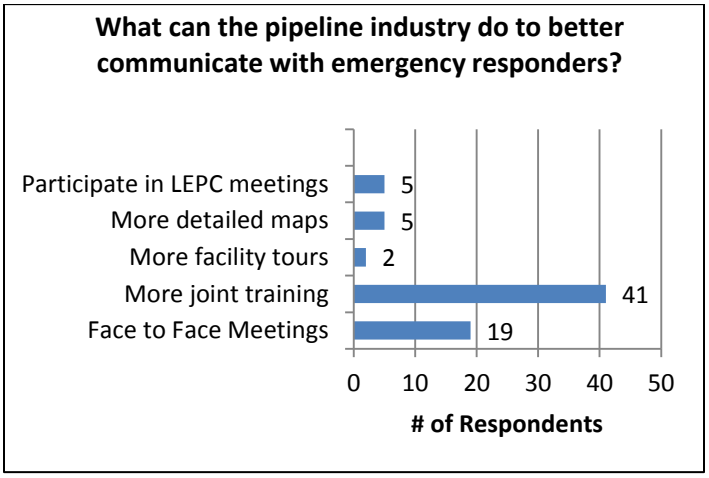

Figure 4

Several respondents suggested that another way to increase communication with emergency responders is for pipeline operator representatives to participate in their Local Emergency Planning Committees (LEPC) (*Figure 4*). Many respondents also advocated the distribution of pipeline maps and materials on DVD or CD because they are easier to store and carry than paper.

To view the survey questions and results in their entirety, please refer to Appendix B.

"Energy Emergencies Workshop" Survey Key Findings

In addition to the survey distributed at the Hotzone Conference, INGAA conducted an informal survey as part of the "Energy Emergencies Workshop" in Houston in September 2011. The purpose of this workshop was to bring together emergency responders and pipeline representatives to discuss ways in which both stakeholders can establish better working relationships. The recurring theme of the workshop was the need for pipeline operators to establish good, working relationships with emergency responder prior to an incident.

In order to build trust and coordinate emergency response efforts with first responders, it is critical that rapport is established prior to an incident. Local field representatives should strive to establish relationships with emergency responders in advance of an incident.

Through the use of an electronic survey, participants were asked to respond in a group setting to questions related to emergency response and the industry. Issues discussed included:

Emergency responders urged pipeline operators to simplify and minimize the materials provided.

It is critical that the industry understand that they are just one of hundreds of responsibilities for emergency responders. The emergency responders suggested the industry consider consolidating some of the materials provided by joining collaborative efforts, or working with other companies that operate in the same region to create one brochure, rather than sending two or more with the same general information. Another approach to streamlining information transfer process might be to provide emergency responders pipeline emergency response information and county maps in electronic formats such as DVD or CD. By providing information electronically, the industry can help emergency responders reduce the flood of paper materials they receive. DVDs, CDs and flash drives are very easy to store, locate and reference prior to or during an emergency situation, they said.

First responders conveyed the critical differences between full-time, paid fire departments and rural volunteer departments.

In order to better communicate with emergency responders, the industry must be aware of the very different capabilities for each of these groups. Due to the nature of volunteer staffing, training opportunities for volunteer departments usually must be scheduled at night or on weekends, not during typical work-day hours.

In addition to their capabilities, volunteer fire departments characteristically have much smaller budgets that do not allow for investing in updated equipment or training opportunities. Paid fire departments in many cases have more resources for response to a pipeline emergency such as combustible gas indicators (CGIs) than do their volunteer counterparts. By providing training, organizing mock emergency or tabletop drills and assisting fire departments with their equipment needs, operating companies can develop local partnerships with emergency response agencies.

While emergency responders communicated that they are deluged with information from the industry, they did not say they don't want or need the information to assist them in responding to an emergency. *They simply want it consolidated*.

The majority of responders surveyed would like to see local coalitions develop between emergency responders, community citizens and pipeline operators to gather and disseminate critical information to all stakeholder groups (*Figure 5)*. The concept behind this is similar to LEPCs, in which members work to develop emergency plans prior to incidents. By creating local coalitions between first responders, public officials, citizens and company representatives, the community can work together to enhance pipeline safety and public awareness objectives.

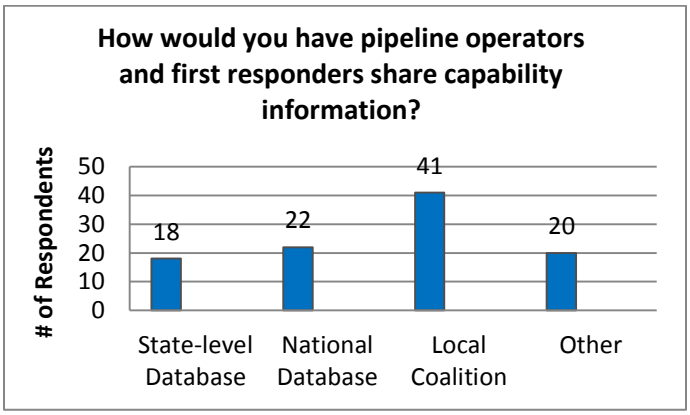

Figure 5

Emergency responders surveyed at the workshop do not believe installation of automated values is the sole way to shorten response times during a pipeline emergency *(Figure 6)*.

Isolation valves will not prevent an incident or its initial consequences, these valves are effective in mitigating secondary damage and making an area safer for emergency responders. First responders indicated that while valves, spacing and selection are important, public safety requires a broader review of incident responses and consequences. INGAA suggests that performance-based Incident Mitigation Management (IMM), using the full ranges of processes and technologies, is the appropriate approach to improve incident response, by reducing incident duration and minimizing adverse impacts. Working toward shortening response times

in the event of an emergency is one of the best remedies to the problem, and INGAA has committed to a one-hour response time for closing valves and isolating critical pipeline segments in its Action Plan for Building Confidence in Pipeline Safety[1].

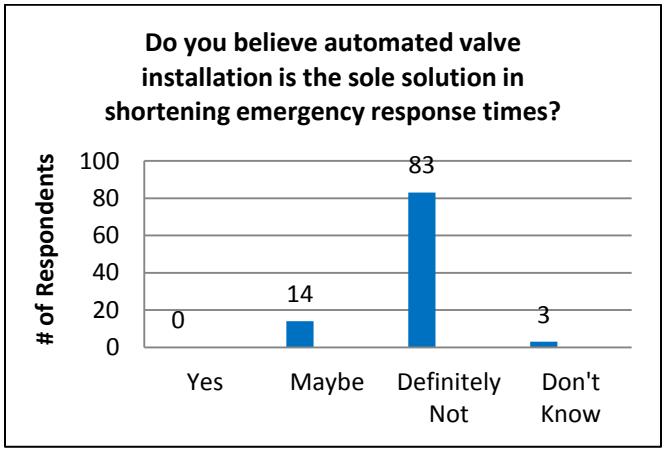

Figure 6

Detailing Current Industry Practices

Emergency responders are an essential stakeholder group for the energy industry. Currently, there are many ways in which operators engage and communicate with the emergency response communities along their pipeline rights of way. The following is a list of current practices used by most natural gas pipeline operators to engage emergency responders:

- Face-face meetings between local operations personnel and local emergency responders to review emergency response plans and procedures.
- Facility tours that allow emergency responders to see how pipelines operate. These tours provide a forum to discuss emergency response procedures.
- Table-top (simulated emergency-response) exercises involving pipeline operations personnel and emergency response personnel.
- Providing industry-related emergency response tools such as the National Association of State Fire Marshal's (NASFM) Training Program to first responders.
- Participating in national and state level collaborative programs aimed at educating first responders.
- Providing supplemental mailings to first responders, such as posters, etc., with additional information about pipelines and emergency response.

[1] http://www.ingaa.org/File.aspx?id=15732--INGAA Action Plan to Build Confidence in Pipeline Safety

- Providing specialty items such as magnets, notebooks and wallet cards featuring emergency phone numbers and other key information.

- Promoting and explaining the National Pipeline Mapping System and the Pipeline Information Management Mapping Application (PIMMA).

- Promoting National Safe Digging Month (NSDM) in April, 8-1-1 National Safe-Digging Day in August and other safe digging and pipeline damage prevention initiatives.

- Participating and attending emergency responder conferences to bring an overall awareness of pipeline, their risks associated with failures and general emergency management information.

- Contributing to volunteer fire departments to assist with emergency response.

- Forming coalitions with state emergency response organizations to develop better relationships with those directly involved in training for emergency responders.

- Sending social media blasts or newsletters to emergency responders to keep them informed of events occurring in their areas pertaining to pipelines such as meetings or conferences.

- Tracking communications with emergency responders through searchable, electronic databases that allow the operator to track and update contract information.[2]

- Ensuring that company first responders are familiar with, and are trained in the Incident Command System (ICS) structure to better coordinate responses during an incident.[3]

- Using new construction and maintenance activities as a proactive way for field personnel to establish relationships with emergency responders.

[2] These databases can serve as an efficient way to search for contacts and records during a PHMSA audit.

[3] The ICS structure is standard practice for emergency responders. Upon arrival at the scene, public sector first responders will name an individual Incident Commander who will effectively take control of the emergency response. ICS training classes provide a detailed overview of the system and how it is implemented at various levels of governmental and non-governmental organizations. Customized ICS training focusing on pipeline emergency response is available through private sector providers. Through the training, pipeline personnel get a better understanding of the structure, titles and facilities used by public sector responders across the nature. Company responders also should be trained on important response concepts as scene size-up, staging, command posts and public information areas.

Potential Communications Enhancements

For a pipeline operator to effectively communicate with and engage emergency responders in a two-way dialogue, they must demonstrate the industry's strong commitment to pipeline safety, awareness and engagement. As an industry, we have continued to go beyond fulfillment of regulatory requirements. There are many strategies that INGAA members are using to communicate more effectively with emergency response personnel. This section will highlight some practices that other operators and the industry might consider.

Work with Emergency Responders to identify hard-to-evacuate areas

In surveys and in discussion, many emergency response personnel have requested additional guidance from pipeline operators to identify areas that might be of high concern both inside and outside federally defined HCAs. A high-concern area may include hard-to-evacuate areas, such a nursing homes or hospital. Often, pipeline operators turn to emergency responders for help in identifying these locations, but emergency responders may not be aware of the intricacies of the pipeline pressure, size or product in the area. In order to effectively identify these areas and minimize the risk to the public, pipeline operators should improve their joint understanding of hard-to-evacuate areas in densely populated regions. Once these "weak points" for local operations have been identified, local field representatives can pass this along to the emergency responders. In addition, during meetings with emergency responders and others, pipeline representatives should strive to ensure that the list is kept up to date.

Develop Quick Reference Materials

First responders have made it clear in surveys and discussions that they feel deluged with paperwork, and are subject to "information overload." In order to streamline the flow of information to emergency responders, the industry should seek to provide information that is vital for response to an incident. First responders need to have quick reference materials, similar to what is provided in seatback pockets on commercial airlines flights. Quick reference materials provide very basic directions for where to go and what to do during an emergency. The information delivered , tailored for the industry, should focus on basic information that emergency responders would need when they arrive on the scene of an incident so that they would not need to read through lengthy corporate response plans, but instead have simple, high-level guidelines to assist them in rapid response (*Figure 10*). An example of a similar comprehensive effort is the "Pipeline Emergency Response Guidelines," published by the Pipeline Association for Public Awareness (PAPA). Information from sources similar to this could

be further coalesced into quick reference response cards unique to the product being transported by pipeline.

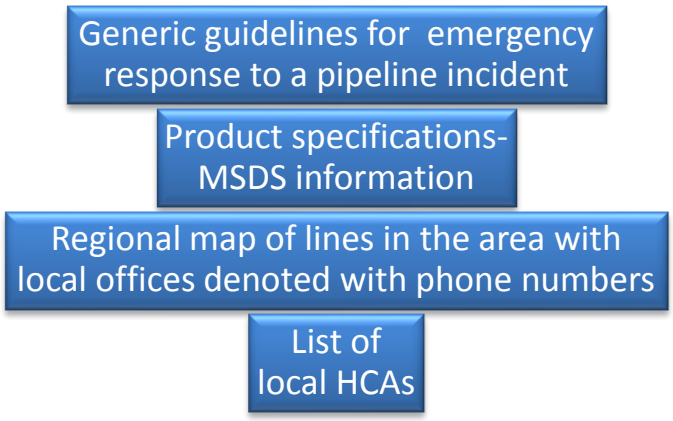

Figure 10: Guidelines for information on Quick Reference Sheets for Emergency Responders

NPMS Enhancements

The natural gas transmission industry might better streamline information for emergency responders by encouraging PHMSA to enhance usability of the National Pipeline Mapping Service. In the event of an emergency, this would allow emergency responders to have a single unified set of maps to locate and utilize. By working with the operating peers in your area to create a "one-stop shop" for emergency response preparedness, operating companies can streamline information flow with emergency responders with the goal of enhanced incident management.

Recognize the Value of Personnel who Serve as Members of Volunteer Departments

During an emergency, one operator found the importance of having a company representative with direct radio communications with responders. In that incident, a local field representative who also serves as a volunteer firefighter was able to foster frequent communication through the use of his fire department radio. In addition to streamlining the communication process, both company first responders and public sector emergency responders found it beneficial to bridge the gaps between company and responder terminology and lingo. The volunteer firefighter/company representative was able to explain steps being taken by both parties during the emergency, and to ensure nothing was lost in translation. Other companies are utilizing company employees who are also volunteer emergency responders as "ER Ambassadors" to

conduct outreach to emergency responders. Emergency responders react well to someone who can "speak their language."

Develop Brief, Informational Videos for Emergency Responders

The industry should consider creating a brief, informational video on pipeline operations and advocate its distribution to emergency response agencies. A 15-20 minute video would allow for a high-level overview of pipelines, why pipeline safety and public awareness are important, key response tactics when responding to a pipeline emergency, and where to go for more information. A brief, concise video of this nature would allow operating companies to engage emergency responders and give them some necessary information without taking up too much of their time and overwhelming them with paper. In addition to distributing this informational video on an individual basis, operating companies can utilize social media forums such as YouTube to post the videos. Posting on a web platform would allow companies to track how many views they receive and would allow for real-time feedback on the contents and material conveyed in the video.

Promote Computer-Based Training Programs

The pipeline industry is developing and promoting computer-based training for emergency responders. Computer-based training (CBT) programs allow for delivery of consistent information in an engaging format that can be delivered at the convenience of the emergency responder. This type of delivery is more efficient because it allows for greater reach than other types of contact, while still providing a great depth of information.

Develop Training Package to be leveraged by existing training centers and programs

Emergency responders have stated a preference for pipeline emergency training to be inserted in or delivered through existing platforms. Natural gas transmission pipeline operators might consider developing a consistent curriculum and offer it or promote it through existing training centers or programs. For example, the industry could explore developing state coalitions to include pipeline emergencies training in existing fire academies and other state level training programs. Additionally, pipeline operators could encourage inclusion of the curriculum in the National Hazardous Materials Fusion Center. PHMSA's National Hazardous Materials Fusion Center offers emergency responders an online location they can utilize to obtain valuable information on HAZMAT resources and training packages for all types of HAZMAT incidents,

ranging from Biodiesel to Hydrochloric acid. Currently, there is no training package specified for liquid or natural gas pipelines. This site also provides emergency responders with critical information on upcoming regional and nationally recognized seminars and conferences. By working with PHMSA to create a training package specific to pipelines, the industry could demonstrate its commitment to pipeline safety and the emergency response community. In addition to creating a training package with the National Hazardous Materials Fusion Center, the industry should continue working to have pipelines included in required HAZMAT Training. Emergency responders overwhelmingly support seeing pipelines included in HAZMAT training.

Recognize Differences in Volunteer and Paid Fire Departments

Volunteer fire departments have very different personnel and financial capabilities than do full-time paid departments. First responders would like to see pipeline operators offer some of their financial backing to properly equip volunteer emergency responders. Many small, rural fire departments have financial constraints, and are in need of equipment to help them respond more efficiently and effectively to pipeline incidents. Operating companies should consider working with local emergency responders to identify equipment needed in order to better equip them to respond to a potential pipeline emergency, such as Combustible Gas Indicators (CGI's), self-contained breathing apparatus, and even used vehicles. By providing local emergency responders with the tools they need to effectively respond to a pipeline incident, operators can build relationships and develop much-needed trust with the emergency response community. In communicating with emergency responders, it is critical that field personnel do not simply provide first responders with a list of what the company expects them to do during an emergency situation. Be sure to ask them what you or your company can do for them.

Additionally, operators should try to keep these differences in mind when scheduling training, exercises or meetings with emergency responders. Volunteers are likely not available during daytime hours. Large, paid departments may have down time in between calls, but they also likely have several rotating shifts.

Actively Participate in Local Emergency Planning Committees

Operating companies can liaise with emergency response personnel by participating in Local Emergency Planning Committees. LEPCs and State Emergency Response Committees (SERCs) were established as part of The Emergency Preparedness and Community Right-to-Know Act of 1986. This legislation calls on states and counties to develop local committees as focal points

for hazardous materials incident response planning. LEPCs were charged with collecting information concerning the hazardous materials that were stored and transported in their jurisdictions. The committees also were tasked with developing response plans and exercises to assess preparedness. Pipeline operator field representatives, who attend LEPC meetings, are able to become liaisons for the company and community. These company representatives can encourage two-way communication between LEPCs and operating companies on a regular basis. By keeping both parties informed, this can ultimately serve as a forum to foster public awareness and pipeline safety in our communities.

Pipeline operators might consider using the Transportation Research Board's Hazardous Materials Cooperative Research Program materials to assist LEPCs in assessing response capability to pipeline incidents. In particular, the TRB's "A Guide for Assessing Community Emergency Response Needs and Capabilities for Hazardous Materials Releases," updated in August 2011, establishes step-by- step processes for local, state and regional bodies to assess and plan for a HAZMAT response.

Better Utilize Social Media Platforms

Electronic capabilities and social media are becoming an increasingly important component of emergency response management. With nearly 175 million registered Twitter users, and 800 million Facebook users worldwide, social media can be a very quick and inexpensive way to convey information during an emergency. In "Social Media during Crisis Response: Five general lessons for emergency managers," Kim Stephens discusses the concept of "if you don't build it, they will come anyway."[4] Her argument is that even if companies do not wish to engage in social media efforts, the public will continue to engage. If a company or industry fails to answer questions and provide information to the public on emergency situations, someone else will, and it may not be credible. Information moves quickly in social media, so companies that require lengthy approval processes for each public message will not be able to communicate effectively to stakeholders during emergencies.

If used properly, social media can prove to be a very effective tool for the industry. Some companies utilize their Facebook and Twitter pages to post emergency preparedness tips and links to helpful and educational articles. According to the Pew Research Center's Internet &American Life Project, some 73 percent of online adults now use a social networking site of some kind. Facebook is the dominant social networking platform in the number of users, but a

[4] "Social Media During Crisis Response: Five General Messages for Emergency Managers," Kim Stephens, 2010

striking number of users are now diversifying onto other platforms. Some 42 percent of online adults now use multiple social networking sites.[5]
Traditionally during an emergency, companies strive to get their message out to the largest number of individuals in the shortest amount of time. Social media is quickly becoming one of the most efficient and effective techniques for rapid communication.

By creating a Facebook and Twitter page, operating companies are conveying their will to reach out to the community and communicate critical information with them in a timely manner. In order to properly use and engage social media in an emergency, companies need to establish a plan for how the platform will be used, who will manage it, and who will authorize messages to be distributed. Companies that use a Crisis Response Team, or an equivalent to it, may find it helpful to have the designated social media representative present in the room during an emergency to ensure they are distributing accurate information in a timely manner to emergency responders and other members of the public.

Measuring What We Do

Measuring the effectiveness of communications is one of the most difficult parts of a public awareness program. In order to measure program effectiveness, pipeline operators sometimes develop tracking corporate engagement efforts
One method for measuring the effectiveness of communication with emergency responders is to track outputs, measure outtakes and measure outcomes. This is a widely accepted standard for measuring communication successes *(Figure 8)*.

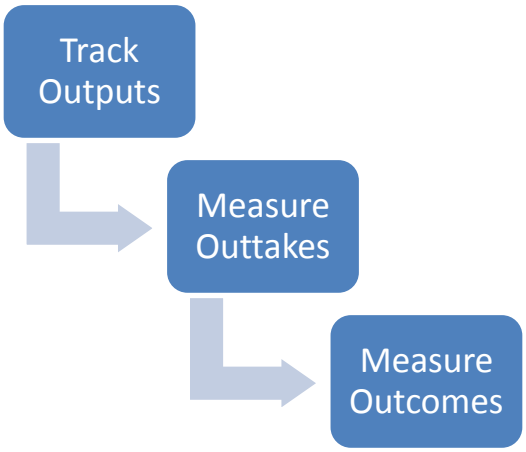

Figure 8: Measuring the Effectiveness of Communication With Emergency Responders

[5] Social Media Update 2013, Pew Research, Internet Project, http://www.pewinternet.org/2013/12/30/social-media-update-2013/

The first stage of the process – tracing outputs – involves documenting the materials the operating company distributes to the public. This would include brochures, mailers, face-to-face meetings, electronic communications and phone conversations with stakeholders, specifically emergency responders. Pipeline companies should refer to PHMSA guidance regarding these data issues.

The second stage in the process is measuring outtakes. During this stage, the actual measuring of the program takes place typically through various methods of collecting data, primarily surveys and focus groups. Some of the most common methods of surveying include mail, phone, online and in-home surveys.

Focus groups are a form of qualitative research in which participants are asked about their opinions, perceptions and beliefs toward a product, service or company.

Whether conducting a survey or focus group, operators should be sure to ask public sector emergency responders what can be done to improve two-way communication between company first responders and public sector emergency responders. These methods are powerful tools to establish a process for measuring the effectiveness of public awareness and engagement efforts with emergency response personnel.

The final stage in this process is measuring outcomes. Did the subject do anything with the information that was provided to him or her? Did he or she pass along the message or materials to any peers in the emergency response community? Here, the data collected during the tracking outputs stage is analyzed, and recommendations of what works and what doesn't are established. With this information, operating companies can now determine how to move forward and better engage the emergency responder community.

Measurement is a continuing process, which will evolve as communication and engagement efforts with emergency responders advance. Measurement is necessary to quantify the information an operator provides to emergency responders. Without measuring communication and materials, there is no way to know if the message has been received, comprehended or recalled.

Achieving Best Practices

In addition to demonstrating a pipeline's financial commitment to pipeline safety, the natural gas transmission industry has made safety as a core value, not just a priority. As referenced in INGAA's submission on "The State of The National Pipeline Infrastructure- A Preliminary

Report", INGAA has "established a board-level task force to pursue further improvements in the industry's safety performance and expand public confidence in the natural gas pipeline infrastructure." The goal of INGAA, and the industry as a whole, is to achieving effective communication with the emergency responder community, not just "checking the box" for compliance. The industry must set a goal to test emergency responders' understanding and comprehension of pipeline safety messages received from operating companies and the organizations in which they participate. There is guidance in the PHMSA regulations to measure effectiveness of these efforts.

Throughout the research phase for this paper, and in discussions with emergency responders, one of the key takeaways is that responders are consistently confused on where to turn for more information or training. There are many tools for training and tips for responding to pipeline emergencies, but there is confusion on how to locate these resources. The industry should continue to explore ways to bridge the communication gaps between emergency responders and operating companies to assist with more effective responses to emergency situations.

For the industry to improve the effectiveness of communication with emergency responders, companies must collaborate, but it is also incumbent upon the individual pipeline operator to develop its own program. By following the steps and Action List outlined below, pipeline operators will enhance the effectiveness of communication with emergency response personnel. The key action items outlined, incorporate tasks meant for industry representatives to pioneer as a group, as well as steps individual pipeline operators can take to enhance their programs.

The following chart is a list of recommended actions for communicating with emergency responders:

Recommended Action List for Effective Communication with Emergency Responders

ACTION	WHO	WHEN
Work on a local-level with emergency responders to develop a two-way communication to review and identify sites and High Consequence Areas	Pipeline Operators	Ongoing
Develop and distribute electronic newsletters, and consider the use of an industry portal	Pipeline Operators/ Pipeline Industry (?(	Ongoing
Purchase and utilize portable command posts	Pipeline Operators	Ongoing
Train company first responders in the Incident Command System	Pipeline Operators	Ongoing
Develop quick reference materials	INGAA	2015
Encourage PHMSA to enhance NPMS	Pipeline Operators/ INGAA	Ongoing
Identify and reach out to company personnel who also serve as volunteer emergency responders; identify ways to leverage these relationships	Pipeline Operators	Ongoing
Develop brief, informational videos for emergency responders	INGAA/ INGAA Foundation project	2015
Actively participate in Local Emergency Planning Committees	Pipeline Operators	Ongoing
Promote Computer-Based Training Programs	Pipeline Operators/Pipeline industry	Ongoing
Develop a training package to be leveraged by existing training centers and programs	INGAA/Pipeline Industry	2014-2015
Continue to push for DOT Emergency Response Guidebook updates	INGAA	Ongoing
Increase participation in conferences for	Pipeline Operators/	Ongoing

emergency response personnel	Pipeline Industry	
Engage with emergency responders by conducting joint drills and exercises	Pipeline Operators	Ongoing
Inform emergency responders of construction and maintenance activities	Pipeline Operators	Ongoing
Recognize the differences in volunteer and paid departments	Pipeline Operators	Ongoing
Take advantage of opportunities to talk about pipeline safety	Pipeline Operators/ INGAA	Ongoing
Keep up to date on INGAA and other industry efforts	Pipeline Operators	Ongoing
Utilize social media platforms such as Twitter and Facebook	Pipeline Operators /INGAA	Ongoing
Track outputs, measure outtakes and measure outcomes	Pipeline Operators	Ongoing

Appendix A - Action Items and Key Highlights from the Energy Emergencies Workshop[6]

- ✓ **Develop Relationships before they are needed -** There was a very strong emphasis on the need for face to face communications just to establish a relationship so that if an event occurs, people know each other.
- ✓ **Combine Efforts** - Emergency responders see the energy industry as HAZMAT not stand alone risk.
- ✓ **Simplify** - Responders are increasingly short of time for training and preparedness and need ease and simplicity in receiving training. Consolidate industry training. Respect their limited time.
- ✓ **Look for Partnership Opportunities –** Emergency responders would like the energy industry to sponsor a better system for "one-stop shop" HAZMAT training, preparedness, lessons learned and communication and to help pull together some of the discrete elements that exist today. Help fund training – Emergency responders have limited budgets.
- ✓ **Develop Coalition/Alliance** - Responders would support a coalition/alliance similar to Common Ground Alliance, to build the next generation system that is sustainable. It must be all inclusive of all the interests involved in HAZMAT, including railroads and probably marine.
- ✓ **Focus on Rural Volunteer Departments** - Any strategy going forward must focus on rural, volunteer departments, which are far more challenged than departments such as those in the Houston area.
- ✓ **Contact 911 ASAP** - The responders generally supported "pulling the trigger" sooner rather than later in contacting 911 and also reflect support for some redundancy in getting eyes and ears looking for an incident.
- ✓ **Identify Plans for Facilities Difficult to Evacuate** - It is important to identify hard to evacuate sites and coordinate with emergency responders. **Share Information for High Risk Sites** - More advanced planning should include identifying locations where infrastructure is involved, like railroad cross-over(s), co-location of water infrastructure, and other high consequence factors.
- ✓ **Look to Other Industries** - The models from the chemical industry, like Transcaer and Chemtrek, which involve the development of local or regional councils of community representatives to share emergency planning information, were mentioned as worth energy company consideration.
- ✓ **Demonstrate Mechanical Integrity to Gain Public's Confidence** - INGAA is implementing IMCI[7]**Emergency Responders are the incident commanders and responsible for *all* emergencies -** Operators *join* the Unified Command, but the Emergency Responders *do not relinquish* command to us. We share in the decision making.
- ✓ **Eliminate our message about being the safest form of transportation in our safety brochures** - Get to the point describing what to do in the event of a pipeline lead or rupture.
- ✓ **Is pipeline marking adequate? -** Should something more like the diamond that shows the hazards Be added?
- ✓ **During an Incident -** The industry person who trains the Emergency Responders needs to be the same person they see at the emergency.
- ✓ **Fire Fighters have public's confidence –** Operators should consider firefighters as spokesperson for safety.

[6] "Energy Emergencies – What's next?" workshop, September 26-27, 2011, Houston
[7] http://www.ingaa.org/File.aspx?id=15732

Appendix B - Energy Emergencies Workshop Survey Results[8]

Do you believe the energy industry should get behind presenting pipelines as a "HAZMAT" for training purposes?

- 75% Yes
- 23% Somewhat
- 2% Not really

How would you have pipeline operators and first responders share capability information?

- 22% National database
- 18% State level database
- 41% Local coalition of pipelines and 1st responders
- 20% Other

Would your company support an Emergency Responder Coalition to implement national process improvements through the following efforts? (Much like Common Ground Alliance)?

- 86% Provide active member to participate in coalition?
- 7% Provide financial support
- 0% Provide support but not active member
- 7% Not Sure

How strongly do you feel a national repository, with some state customization for mapping data, training resources with exercise scenarios, after action reviews, evacuation routes, records and resource categories would work?

- 100% Very strongly
- 0% somewhat strongly
- 0% Not so much
- 0% definitely not

The National Transportation Safety Board has recommended that pipeline operators call 911 directly. Would you support any other back-up options that pipeline operators would call?

- 8% State Operations Center
- 42% Local 911
- 0% Pipeline locations in ChemTrek who call utility
- 50% some combination of all of the above

NTSB and PHMSA's approach to shortening emergency responds times in automating / installing valves. Do you believe that valve installation is the sole solution?

- 0% Yes
- 14% Maybe
- 83% No way
- 3% don't know

[8] "Energy Emergencies – What's next?" workshop, September 26-27, 2011, Houston

If pipeline operators call rural and understaffed fire departments on unverified incidents that turn out to be false alarms, would your response community:

72% Support the call-out
17% be neutral about the call-out
10% be upset about the call-out

Would you be willing to provide your geographic boundaries and 7 digit 911 dispatch phone numbers in a state or national database?

92% Yes
8% Maybe
0% No

If your control room operator had an indication, but not verification of a pipeline rupture, would they:

15% automatically shut in the pipeline
41% spend a few more minutes gathering information before shutting in the valves
37% wait for field verification of pipeline rupture to shut-in
7% Wait for field verification and ask permission from operation department management

How helpful would the following information be to you during a response to a pipeline rupture: product characteristics, pipeline diameter, and pressure, length of time to close valve, product dissipation time, radiant heat, operator plan, and operation response team?

84% extremely helpful
12% Helpful
0% Neutral
4% Worthless

If you are an emergency responder, do you think the Portal demonstrated by Shell Pipeline would provide valuable pipeline emergency training communications to fire fighters and other emergency responders?

96% Yes
4% No

If you are a pipeline operator, do you think your company would be interested in utilizing the Portal to provide pipeline emergency training and communicating to fire fighters and other emergency responders?

86% Yes
0% No
14% Undecided

Appendix C - Hotzone Emergency Responder Survey Results Summary[9]

1. Have you ever received information in the mail from a pipeline company?
    a. Yes: 77 51%
    b. No: 74 49%

2. Do you know what to do in the event of a pipeline emergency?
    a. Yes: 97 64.7%
    b. No: 11 7.3%
    c. Maybe: 42 28%

3. Should the energy industry support presenting pipelines as a part of "HAZMAT" training?
    a. Yes: 144 95.3%
    b. No
    c. I don't know: 7 4.7%

4. Do you feel that a national database with customized pipeline mapping data, training resources and exercise scenarios would be helpful to you and your company?
    a. Definitely yes: 135 90%
    b. Definitely not: 1 .7%
    c. I don't know: 14 9.3%

5. Do you believe the pipeline industry as a whole needs more Incident Command System (ICS) Training to better dovetail company responses with emergency responders?
    a. Definitely yes: 106 72.1%
    b. Maybe: 40 27.2%
    c. Definitely not: 1 .7%

6. Have you met, or are you familiar with your local pipeline representatives?
    a. Yes: 85 56.7%
    b. No: 65 42.3%

7. Do you feel the pipeline industry provides you with the information and resources you need to successfully respond to a pipeline incident?
    a. Yes: 74 49.7%
    b. No: 34 22.8%
    c. I don't know: 41 27.5%

8. Have you ever participated in a joint Tabletop Exercise with a pipeline company?
    a. Yes: 43 28.5%
    b. No: 108 71.5%

[9] Hotzone Emergency Responders conference, October 2011, Houston

9. Are you familiar with the Pipeline Emergencies training program? If yes, how have you used it?

    a. Yes: 37 25.9%
    b. No: 106 74.1%

10. What can the pipeline industry do to improve communications with emergency responders?

    -More face to face meetings at fire station: 19
    -Provide more joint training with emergency responders: 41
    -Provide tours of pipeline operations: 2
    -Provide more detailed mapping of systems: 5
    -Participate in LEPC meetings: 5
    -Provide info on internet: 5
    -Have an annual Tabletop Drill: 3
    -Pipeline personnel should be trained in NIMS/ ICS: 1
    -Maintain better lines: 1
    -Learn ICS and NIMS: 1
    -Provide training materials to state fire school: 1
    -Set up a radio plan/system with one common channel during emergency: 2
    -Attend conferences or trade association meetings like Hotzone: 2
    -Have a 24 hour phone line dedicated for emergency responders: 1
    -Create the national database for information: 3

11. In addition to Material Safety Data Sheets, and general response recommendation information, what other resource materials from pipeline operators would increase your knowledge and ability to respond to a pipeline emergency?

    -Updated contact list of who to call in emergency: 10
    -Response tactics or shut down information: 10
    -Review of previous response activities: 1
    -Additional training: 8
    -Mobile apps for live information: 4
    -Provide information to dispatch centers: 1
    -More system maps on DVD or web-based: 19
    -Secured website with live information: 1
    -More detailed pipeline markers: 2
    -Financial assistance with equipment needs for response: 3
    -Facility tours: 1
    -Conduct joint tabletop exercises: 1
    -Annual training sessions: 1

12. What can the pipeline industry do to improve communications with emergency responders?
    -More joint training: 1
    -Conduct an annual “update meeting” with other operators & invite ER’s: 2
    -Send company representatives to the county and state chief’s associations meeting: 1

Appendix D - Regulations

Overview of Regulations Related to Emergency Response

Natural gas and hazardous liquids pipelines are regulated at the federal level through the U.S. Department of Transportation's Pipeline Safety Regulations codified in 49 CFR Parts 190 to 199. These regulations establish minimum requirements for the construction, maintenance, and operation of pipelines and liquefied natural gas (LNG) facilities. For intra-state pipelines, state managed pipeline safety programs enforce federal pipeline safety regulations and often impose additional requirements. Interstate natural gas pipelines are also regulated by the Federal Energy Regulatory Commission (FERC) in the areas of siting, construction, environmental protection and tariffs.

The Department of Transportation's Pipeline Safety Regulations have contained provisions requiring coordination and liaison with public sector emergency responders for some time. In recent years the requirements have become more specific concerning the expected interaction and messaging to this stakeholder group.

Emergency Plans

Pipeline operators are required to develop and maintain emergency plans addressing a variety of situations that may occur and require emergency response. Further, pipeline operators are required to coordinate with public sector responders related to pipeline emergency response. The specific requirements are:

Natural Gas Pipelines
§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: ….

(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.

(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 response 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

Hazardous Liquids Pipelines

§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 to exceed 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.

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

(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.

Public Awareness

Pipeline public awareness requirements are included in the Department of Transportation Pipeline Safety Regulations for some time. With the incorporation by reference of American Petroleum Institute Recommended Practice 1162 (API RP 1162) in 2005, extensive new public awareness mandates have been placed upon the pipeline industry. API RP 1162 is a guidance document resulting from a collaboration of industry representatives, regulators, public safety officials and other interested parties with the goal of increasing pipeline safety through increased awareness.

In this document, four "stakeholder groups" were defined: The Affected Public, Local Public Officials, Emergency Officials, and Excavators. In addition, specific messages for each stakeholder group are specified. For Emergency Officials, the messages stipulated are:

- Location of transmission pipelines that cross their area of jurisdiction, and how to get detailed information regarding those pipelines

- Name of the pipeline operator and the emergency contact information for each pipeline
- Information about the potential hazards of the subject pipeline
- Location of emergency response plans with respect to the subject pipelines
- How to notify the pipeline operator regarding questions, concerns, or emergency
- How to safely respond to a pipeline emergency
- An overview of what operators do to prevent accidents and mitigate the consequences of accidents when they occur
- How to contact the pipeline operator with questions or comments about public safety, additional overview information on Integrity Management Programs to protect High Consequence Areas under their jurisdiction, land use practices or other matters.

With the incorporation by reference of API RP 1162 into §49 CFR Part 192.616 – Public Awareness, pipeline operators were required to develop a written Public Awareness Plan, identify specific messages for each stakeholder group, establish message delivery methods and evaluate the effectiveness of their respective programs.

A key provision of the Pipeline Public Awareness requirements is the identification of audiences by stakeholder group. For Emergency Officials, the audiences defined are:

- Local, state, or regional officials with emergency response and/or public safety jurisdiction along the pipeline route. Examples include: fire departments, police/sheriff departments, Local Emergency Planning Commissions (LEPCs), County and State Emergency Management Agencies (EMA), other emergency response organizations, and other public safety organizations.

API RP 1162 provides additional guidance to pipeline operators concerning interface with the emergency official's stakeholder group. The standard addresses the importance of making pertinent information from emergency plans developed by pipeline operators available to emergency officials during regular interface opportunities. In addition, the standard advocates the use of drills and exercises conducted jointly with public sector responders.

National Pipeline Mapping System (NPMS)

The National Pipeline Mapping System (NPMS) is a federally managed Geographic Information System (GIS) containing geospatial and metadata for hazardous liquids, gas transmission, and liquefied natural gas facilities operated within the United States. As a requirement of the

Pipeline Safety Improvement Act of 2002, pipeline operators are mandated to submit geospatial and metadata to the NPMS on an annual basis.

A key element of the National Pipeline Mapping System is the availability of the data to the public via the internet. Concerned citizens have the ability to use the system to discover which pipelines are operated in their area and obtain contact information for the pipeline operators. Emergency officials can register with the NPMS and obtain GIS mapping data concerning the pipelines that are operated in their jurisdictional areas. This data can then be combined with existing GIS data by the jurisdiction as an additional mapping layer for pre-planning and response purposes.

Pipeline Integrity Management

One of the most significant regulations to impact the pipeline industry was that of Pipeline Integrity Management. Initially codified in the Hazardous Liquids Regulations and later in the Gas Pipeline Regulations, Integrity Management dictated a comprehensive program of risk-based inspections of pipelines located in High Consequence Areas.

A key requirement of the Gas Pipeline Integrity Management Regulation is the identification of "Identified Sites" which are a category of "High Consequence Areas" (HCA's). High Consequence Areas denote areas of population density or locations of individuals with limited mobility that could be impacted in the event of a transmission pipeline failure. The Gas Integrity Management Regulation has provisions requiring pipeline operators to enlist the assistance of emergency responders when identifying these "identified sites". Specifically:

§192.905 How does an operator identify a high consequence area?

(b)(1) Identified Sites. An operator must identify an identified site for the purposes of this subpart, form information the operator has obtained from routine operation and maintenance activities and from public officials with safety or emergency response or planning responsibilities who indicate to the operator that they know of locations that meting the identified site criteria. These public officials could include officials on a local emergency planning commission or relevant Native American tribal officials"

As High Consequence Areas are identified, the pipeline operators must evaluate the risks associated with the pipeline segments located in these areas and develop plans for assessing the integrity of the line segments. The regulation provides for several different pipeline inspection methods that can be used based on the previously identified risks and the construction of the pipeline.

While two separate requirements, the Pipeline Integrity Management and Pipeline Public Awareness regulations do contain some overlap and cross-referencing. Pipeline Integrity Management communications requirements are identified in API RP 1162 for the various stakeholder groups. Specifically for emergency officials, the API RP 1162 guidance stipulates that pipeline operators should include an overview of the operator's Pipeline Integrity Management Program as part of the information conveyed during interface with emergency officials.

Damage Prevention Requirements for Underground Utilities

Outside force contact is a leading cause of damage to all underground utilities including natural gas and hazardous liquids pipelines. A variety of state statutes exist requiring notification to utility operators in advance of excavation activities. These statutes also provide for penalties for damaging utilities resulting from unauthorized excavation. Utility operators engage in a variety of education efforts to minimize the risk to their underground assets from unauthorized excavation activities. The Common Ground Alliance (CGA) has served as a national voice to aide utility operators in this education effort. Recently, the implementation of the national 811 "Call Before you Dig" number was coordinated in large part due to the efforts of the CGA.

For several years, the CGA has published a comprehensive "Best Practices" document that is a compilation of noteworthy damage prevention activities from utility operators. A focus of this Best Practice document is public education. In regards to emergency officials, the CGA's Best Practices advocates engaging this stakeholder group in assisting with spreading the message for the need for damage prevention and one-call notification. Emergency responders are viewed as a very credible source for damage prevention advocacy given the fact that they must respond to incidents resulting from unauthorized excavation activities that damage natural gas and hazardous liquids pipelines.