

PIPELINE SAFETY: MOMENTUM ON DAMAGE PREVENTION

COMMENTARY FROM TIMOTHY FELT, VICE CHAIRMAN OF THE ASSOCIATION OF OIL PIPE LINES AND COMMON GROUND

From a public safety standpoint, damage to pipelines caused by excavation is one of the industry's most serious concerns. Pipeline operators, and other underground utility personnel, have long focused on developing effective mechanisms to convince the public of the importance of using one call systems prior to excavation in order to prevent facility damage and, more importantly, serious injuries and fatalities. We have come a long way in recent years, and we have momentum to accelerate our progress, not only in the interest of public safety, but also in order to protect the integrity and reliability of the pipeline system.

Several initiatives have brought together facility owners, excavators and state one call programs to work on this issue. One such initiative, the 2000 Common Ground Alliance (CGA), developed a set of best practices for damage prevention. CGA is also taking the lead in the "811" campaign to promote a national "one call

system" phone number. Congress reinforced these efforts last year by passing the Pipeline Inspection, Protection, Enforcement and Safety (PIPES) Act of 2006. The PIPES Act created an incentive for states to upgrade their damage prevention programs by offering grants to improve nine elements deemed essential to an effective damage prevention program.

Several states, including Virginia and Texas, have already revised and strengthened their programs. Lessons from those programs are being shared across state boundaries through the Regional CGAs, the work of the Pipeline and Hazardous Materials and Safety Administration (PHMSA), and a new multi-stakeholder initiative to strengthen state programs as intended by the PIPES Act. As these state programs are improved and the performance measured, we expect to see a significant reduction in damage to underground facilities, and a lower risk to public safety. Key to measuring our progress are the results, as captured

in the Damage Information Reporting Tool (DIRT).

The liquids pipeline industry embraced the power of learning from data to improve its release performance by establishing its own voluntary spill reporting system in 1998. The Pipeline Performance Tracking System (PPTS) collects information on all types of releases, not just those caused by excavation and other mechanical damage.



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811: NATIONAL ONE CALL NUMBER ROLLED OUT

May 1st, 2007, the Common Ground Alliance (CGA), government officials and national media gathered on the National Mall in Washington, D.C., for the launch of the 811 national awareness campaign. "811" is the new national phone number for the public - from road builders to construction companies to homeowners - to contact state One Call notification systems in advance of

any excavation. The Pipeline Safety Improvement Act of 2002 mandated the establishment of a single number to eliminate the confusion of the different notification numbers used in most states.

Secretary of Transportation Mary Peters (pictured) led off the press conference followed by members of Congress, Federal Communications Commission and industry

partners. The Associated General Contractors of America (AGC), John Deere, The Travelers Companies, Inc., and Cox Communications joined CGA as the national launch partners in the 811 ceremony.

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NATIONAL TRANSPORTATION SAFETY BOARD (NTSB) ON DAMAGE PREVENTION

"In 1970 when the Safety Board first identified excavation damage as the largest single cause of pipeline accidents and of deaths and injuries resulting from pipeline accidents. Board investigations, safety studies, and safety promotion activities have been instrumental in convincing federal and state agencies, pipeline industry organizations, and pipeline operators to develop one - call notification systems, state laws, and public education

programs aimed at reversing the increasing trend of excavation caused damages to gas lines and other buried facilities. As a result, there are one - call notification centers in all states and the District of Columbia and excavation damage prevention laws in 48 states and the District of Columbia. Similar programs have been implemented in five other countries. In the 1970s, excavation damage to pipelines was estimated to cause 50 to 60 percent of all

pipeline accidents. While still the largest single cause of pipeline accidents and damage to other buried facilities, excavation damage now accounts for only 25 percent of all pipeline accidents." From *We Are All Safer: NTSB-Inspired Improvements in Transportation Safety.*

"Excavation and construction activities are the largest single cause of accidents to pipelines. Data maintained by the U.S. Department of Transportation, Research and Special Programs Administration

(RSPA), Office of Pipeline Safety, indicate that damage from outside force is the leading cause of leaks and ruptures to pipeline systems, accounting for more than 40 percent of the reported failures. According to the data, two-thirds of these failures are the result of third-party damage; that is, damage caused by someone other than the pipeline operator."

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FROM OUR ONE CALL PARTNER, NATIONAL UTILITY LOCATING CONTRACTORS ASSOCIATION (NULCA) COMPANY SPOTLIGHT: CRUZ BROTHERS LOCATORS

An example of a professional locating company is Cruz Brothers Locators, established in 1989 as one of the first locators in the San Francisco Bay area. Today there are more than 20 locating service firms operating in the San Francisco region. Cruz Brothers does contract and private locating in their home area and across the state of California. Robert Cruz, owner

of this Scotts Valley, California, firm joined the National Utility Locating Contractors Association (NULCA) in 1994 soon after the association formed. "We believe that is important to stay current with technology, legislation and other factors affecting our business, and participating with a national association helps us pursue safety for our employees as well as the

buried infrastructure," Cruz said.

"The bay area of Northern California is highly urbanized, and has experienced continuous growth for many decades. Cruz reflects that while the local utility infrastructure is not as old as that in many areas of the country, it has become highly congested, and new construction is ongoing.

As a result there is strong demand for expanded services by utilities and excavators. Our customers increasingly need to know how things are arranged underground, such as what kinds of conduit is in place and how is it arranged, and precise details about the

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DAMAGE PREVENTION TOP PRIORITY OF PHMSA

(Reprinted from PHMSA FOCUS Special Edition Spring 2007)

For years the Department of Transportation has been continuously challenged to improve the safety of underground pipelines, especially through the reduction of excavation damage. In the late 1990's, Congress gave the Research and Special Programs Administration, the Department's

former agency with oversight over pipeline safety, one of the largest assignments it had ever taken on: determining the most effective damage prevention practices to put an end to, what was at the time, the number one cause of pipeline accidents.

The process involved utilizing an enterprise approach to

reach consensus with over 160 industry and government professionals who volunteered their time to create the Common Ground Study in 1999, best practices to reduce underground facility damage, and eventually the Common Ground Alliance (CGA) in 2000. The work of this public/private partnership and their collaborative approach



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811: NATIONAL ONE CALL NUMBER ROLLED OUT

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 “AGC has the most comprehensive safety program for the industry and our members recognize that they have both a legal and moral obligation to protect their employees, the public, and public and private assets,” said CEO Steve Sandherr. “Both a homeowner building a deck in the back of their house and a large national contractor building a new baseball stadium in Washington begin with a shovel piercing the dirt.”

John Deere and the other launch partners have committed their support by promotion of the new number through existing industry communication channels, trade shows, magazine ads, and online and printed materials. “We highly value this opportunity to support this important 811 effort because it is consistent with John Deere’s emphasis on safety, on the job and at home,” says Bob Brock, senior vice president, sales and marketing in John Deere’s Construction & Forestry Division. “Ultimately, we anticipate that the new national number will

become top-of-mind to contractors and consumers and help reduce or eliminate the more than 680,000 utility interruptions each year.”

The event was covered by local, state, and national media, including MSNBC. The new 811 mascot, BUD (Before U Dig), was also introduced at the event. BUD is available for guest appearances at trade shows and other events in an effort to spread the 811 message of safety. The campaign also includes a public service

announcement and state specific launch events and other collective initiatives.

For more information on 811, visit www.call811.com.



LANDOWNERS AND PIPELINE OPERATORS - A SYMBIOTIC RELATIONSHIP

The communication between operators and landowners plays a crucial role in pipeline safety. As pipeline operators’ expanded public awareness programs and increased usage of media outlets, distribution of educational safety materials, involvement with local officials and implementation of the industry’s recommended practices (API RP 1162), the communication

gap between landowners and operators has decreased.

Pipeline operators rely on landowners’ vigilance as an integral part of the damage prevention process. Glenn Archambault, a neighbor of the TransCanada 35’ gas pipeline in Oregon, exemplifies the kind of landowner pivotal to pipeline safety (see picture to right of initial construc-

tion). “My area has many people who do not call to locate when digging or get building permits for any type of construction. Whenever people show up with heavy equipment in my area I keep an eye on them and make sure they are not near the pipeline. I have stopped people and the pipeline operator has stopped people digging without locating or contacting the pipeline

operator.” Since third party damage is one of the major contributors to excavation damage, any monitoring done by members of the community is beneficial, not just to the operator, but to the broader community.

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FROM OUR ONE CALL PARTNER, NATIONAL UTILITY LOCATING CONTRACTORS ASSOCIATION (NULCA) COMPANY SPOTLIGHT: CRUZ BROTHERS LOCATORS

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 “The bay area of Northern California is highly urbanized, and has experienced continuous growth for many decades. Cruz reflects that while the local utility infrastructure is not as old as that in many areas of the country, it has

become highly congested, and new construction is ongoing. As a result there is strong demand for expanded services by utilities and excavators. Our customers increasingly need to know how things are arranged underground, such as what kinds of conduit is in place and how is it arranged,

and precise details about the location and depth of certain features,” he explains. “We’ve responded by adding capabilities such as vacuum extraction, ground penetrating radar and leak detection equipment to our tool list.

As in virtually every area

across the country, hiring, training and retention of locators is an ongoing challenge for Cruz Brothers and they are constantly engaged in recruitment and training.

From NULCA News Spring 2007

NATIONAL TRANSPORTATION SAFETY BOARD (NTSB) ON DAMAGE PREVENTION

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From Protecting Public Safety Through Excavation Damage Prevention

The National Transportation Safety Board (NTSB) is an independent federal agency that investigates significant accidents in the mode of railroad, highway, marine, and pipeline transportation. The NTSB issues safety recommendations with the aim of preventing future accidents. Excerpts from recent excavation damage investigations follow:

Wilmington, Delaware: July 2, 2003

“On July 2, 2003, Quickform Concrete Company, a contractor hired by the city of Wilmington, Delaware, to replace sidewalk and curbing dug into an unmarked natural gas service line with a backhoe. Although the service line did not leak where it was struck, the contact resulted in a break in the line inside the basement of 1816 West 3rd Street, where gas began to accumulate. A manager for the contractor said that he did not smell gas and therefore did not believe there was imminent danger and that he called an employee of the gas company and left a voice mail message. At approximately 1:44 p.m., an explosion destroyed two residences and damaged two others to the extent that they had to be demolished. Other nearby residences sustained some damage, and the residents on the block were displaced from their homes for about a week. Three contractor employees sustained serious injuries. Eleven additional people sustained minor injuries.”

“The National Transportation Safety Board determines that the probable cause of the July 2, 2003, natural gas explosion in Wilmington, Delaware,

was the failure of Quickform to verify that all underground facilities were marked within the proposed dig site before beginning excavation. Contributing to the accident was the failure of Tech Consultants and Quickform to effectively communicate about the project scope. Contributing to the severity of the accident was the failure of Quickform employees to immediately notify the utility owner and emergency authorities when they realized they had struck and pulled up a gas service line.”



“In response to this safety recommendation, on June 13, 2003, OSHA issued a Safety and Health Information Bulletin that advises contractors on the hazards of striking underground gas lines during excavation work. The bulletin recommended informing the pipeline operator immediately if the excavator causes damage to a pipeline and to immediately contact emergency authorities if the damage results in a release of natural gas or other hazardous substances.” For more information, visit: www.nts.gov/publictn/2004/PAB0401.pdf

“The project coordinator called Miss Utility for the original address and utilities were marked, however, the project coordinator decided that adjacent addresses needed work too and marked those in white to show the scope of work, leaving a service line unmarked.”

Bridgeport, Alabama: January 22, 1999

“On January 22, 1999, while digging a trench behind a building at 406 Alabama Avenue, a backhoe operator damaged a ¾-inch steel natural gas service line and a 1-inch water service line. This resulted in two leaks in the natural gas service line, which was operated at 35 psig. One leak occurred where the backhoe bucket had contacted and pulled the natural gas service line (pictured). The other was a physical separation of the gas service line at an underground joint near the meter, which was close to the building. Gas migrated into the building at 406 Alabama Avenue, where it ignited about 10:02 a.m. An explosion followed, destroying three buildings: 404, 406, and 408 Alabama Avenue. Other buildings within a two-block area of the explosion sustained significant damage.

Three fatalities, five serious injuries, and one minor injury resulted from this accident.”



“The National Transportation Safety Board determines that the probable cause of the accident was the failure of R&B Construction to establish and follow safe procedures for excavation activities, resulting in damage to a ¾-inch natural gas service line, and the failure of the Utilities Board of the

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PIPELINE INDUSTRY TAKES A LEAD IN NATIONAL EMERGENCY PLANNING EXERCISE

The National Response System is the federal government's mechanism for coordinating emergency action after discharges of oil and the release of chemicals in the United States and its territories. The Oil Pollution Act of 1990 mandated frequent exercises to test multilateral responses to "Spills of National Significance" (SONS). The exercises focus on coordination between the Environmental Protection Agency (EPA), the U.S. Coast Guard, agencies of the National/Regional Response Teams, other national-level coordinating bodies, and affected state, local, and private industry players.

The 2007 SONS exercise is predicated on a possible earthquake in the New Madrid Seismic Zone, located within the Mississippi River Valley. "Large-scale exercises like SONS provide participants with

an excellent opportunity to practice coordinating response efforts with the various federal, state and local agencies that would respond in a real emergency," said Jay Jones, director of emergency response for ConocoPhillips. "We gained valuable experience from the 2004 SONS drill, and this year's exercise may be even more challenging because of the vast geographic area involved in the scenario."

ConocoPhillips, one of ten oil, gas and pipeline companies participating, has more than 130 employees and several regional operations participating in the SONS exercise, including the Wood River Ill refinery, two storage terminals, and a lubricants packaging plant.

Three phases

The first phase of the three day exercise, taking place June 19 – 21, 2007, will

involve the implementation of the oil and hazardous substance response objectives of the National Contingency Plan (NCP) and associated Regional and Area Contingency Plans (NRP) following a 7.7 earthquake and its resulting aftershocks. In the scenario, the earthquakes originate in the New Madrid Seismic Zone and could potentially cause multiple oil and hazardous substance releases across the entire Central United States. A tornado-triggered incident in the Great Lakes will also be part of the exercise.

Phase two of SONS will include a discussion-based workshop, at which time recovery and restoration issues

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LEVERAGING PIPELINE DAMAGE PREVENTION TECHNOLOGY DEVELOPMENT

Excavation damage remains a significant threat by means of event frequency and consequence to life and property. Since 2002, the Pipeline and Hazardous Materials and Safety Administration's (PHMSA) Pipeline Safety R&D Program has jointly invested in number of research projects with the pipeline industry. PHMSA has invested over 1.2 in damage prevention technologies and best practices with over \$1.2 million, combined with over \$1.6 million of industry co-funding.

Much of the Research is cofunded with industry through the Pipeline Research Council International, Inc. (PRCI). PRCI is a not-for-profit, membership organization that conducts research committed to enhancing the safety, reliability and productivity of the energy pipeline industry. PRCI has developed

R&D roadmaps for Right-of-Way Monitoring and Damage Prevention and to Deploy the Cohesive and Comprehensive Means to Manage Mechanical Damage. These roadmaps may be found at http://www.enebuilder.net/inthepipe/e_article000792211.cfm

The following project descriptions provide more information on several of the PHMSA funded technologies:

Infrasonic frequency seismic sensor system for preventing third party damage to gas pipelines

The objective of the proposed program is to design, develop and test an Experimental Prototype (EP) sensor, advancing the Infrasonic-Frequency Seismic Sensor System (aka PIGPEN) technology to a point where the system is ready for advanced engineering and pre-commercial design and prototyping.

Using an independent consultant (to be determined), all issues related to soil geophysics (and in particular signal wave velocity) will be examined and interpreted for the proposed design and EP. Also, as a result of utility, sponsor and cosponsor review, additional tasks will be determined.

Nonlinear Harmonic-based Mechanical Damage Severity Criteria for Delayed Failures in Pipelines

Delayed failures of mechanically damaged pipelines can occur unexpectedly and with serious consequences due to time-dependent fracture mechanisms,

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became the catalyst for all damage prevention efforts following the CGA's establishment.

Today we are continuing to experience difficulty in our collective efforts to protect underground facilities. Damages to underground utilities resulting from excavation related activities are on the rise nationwide.

The nation depends on these underground systems, including gas and oil pipelines, electric lines, telecommunications cables and other infrastructure to maintain our way of life. The introduction of "8-1-1" gives us a little added assistance in our efforts to deliver on this dependence by providing a new tool all can use to preserve safety and ensure service interruptions remain minimal.

We all know that damage by third parties is almost entirely preventable. Throughout its existence, the Common Ground Alliance has been at the forefront of stressing the importance of calling before digging and reminding all underground facility owners to correctly locate their utilities before excavation or construction activities commence. But there's still more to do. In researching the best ways to protect underground resources, we've come to learn we must work together to continuously find practices that will effectively enhance the safety of underground systems.

Whether we're government regulators or part of a specific utility industry, increasing our safety effectiveness is a huge task. Together, we must reinforce the need to proactively protect workers and underground utilities by

confirming the accuracy of facility locations, using only qualified personnel for excavation activities, and utilizing safe excavation practices, including hand digging when necessary.

Over the years the CGA has done a great job in bringing all underground utility stakeholders together to protect our systems from external damages. 8-1-1 is another collective innovation and great advancement from the CGA and its members.

I would like to personally thank the CGA, all of its member sponsors, and launch partners of the 8-1-1 campaign for bringing the new number into existence.

As we move forward, the education and awareness of our ultimate customer, the American public, will prove to be our most valuable asset in the use of the new 8-1-1 number and our battle against third party damage. The public too must know the role they play in protecting themselves and improving safety and efficiency within their communities.

PHMSA looks forward to a full-fledged nationwide implementation of the 3-digit number to increase the use of One-Call services and to minimize confusion over the appropriate number to call to report planned excavation within any state.

We are extremely gratified with the important advances that we, in partnership with the many other members, have brought about since the CGA's establishment. We've come a long way and the future looks even more promising now that 8-1-1 is a reality.

With communities increasingly expanding, newer ones are being built in areas where pipelines and other utilities previously existed out of harms way. Accompanying this growth and expansion are also newer utilities that are needed to connect people to



people and their communities to vital resources.

[Photo: Damage to pipelines resulting from a crowded underground infrastructure is a major problem pipeline operators and regulators continue to face. The photo shows an operator's discovery of newly installed fiber optic lines directly over natural gas pipeline. From PHMSA FOCUS Winter 2006.

The continued vigilance and efforts of each of you in preventing damage to underground infrastructures are critical to ensuring safe, clean, and reliable operation of the critical underground "lifelines" in our Nation's communities. Please know that we are counting on your continued dedication as we move forward.

Vice Admiral Thomas Barrett is currently the Acting Deputy Secretary of Transportation and Administrator of the Pipeline and Hazardous Materials Safety Administration (PHMSA). He has been nominated by President Bush to be Deputy Secretary of Transportation.

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City of Bridgeport to provide appropriate emergency response to the resulting natural gas leak.”



For more information on recommendations made following this accident, visit: <http://www.nts.gov/publictn/2000/PAB0001.pdf>

St. Cloud, Minnesota: December 11, 1998

“About 10:50 a.m. on December 11, 1998, while attempting to install a utility pole support anchor in a city sidewalk in St. Cloud, Minnesota, a communications network installation crew struck and ruptured an underground, 1-inch-diameter, high-pressure plastic gas service pipeline, thereby precipitating a natural gas leak. About 39 minutes later, while utility workers and emergency response personnel were taking preliminary precautions and assessing the situation, an explosion occurred. As a result of the explosion, 4 persons were fatally injured; 1 person was seriously injured; and 10 persons, including 2 firefighters and 1 police officer, received minor injuries. Six buildings were destroyed. Damage assessments estimated property losses at \$399,000.”

“The National Transportation Safety Board determines that the probable cause of this accident was the lack of adequate procedures by Cable Constructors, Inc., to prevent damage to nearby utilities when its anchor installation crews encountered unusual conditions such as striking an underground obstacle. Contributing to the sever-



ity of the accident was the delay by Cable Constructors, Inc., in notifying the proper authorities.”

“The major safety issues identified in this investigation are the adequacy of the safety and emergency procedures used by Cable Constructors Inc.’s crews when working in the vicinity of underground facilities and the adequacy of St. Cloud Fire Department procedures and training for responding to natural gas leaks.”

As a result of its investigation of this accident, NTSB made specific safety recommendations. For more information, visit: <http://www.nts.gov/publictn/2000/PAR0001.pdf>



“Although the sidewalk was accurately marked, the anchor deflected underground and ruptured the gas service line.”(pictured)

In the Pipe thanks Rod Dyck, Prinicipal Pipeline Engineer, NTSB. Mr. Dyck’s presentation to the New Mexico Common Ground Alliance Conference is on the In the Pipe website link Pipeline Safety

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The liquids pipeline industry embraced the power of learning from data to improve its release performance by establishing its own voluntary spill reporting system in 1998. The Pipeline Performance Tracking System (PPTS) collects information on all types of releases, not just those caused by excavation and other mechanical damage. The industry was able to leverage PPTS by adding a DIRT-only module to the existing system. In addition, the PPTS system now includes a path for reporting near-misses. By using the PPTS as the reporting vehicle, the liquids pipeline industry has created a one-stop shop for reporting excavation damage incidents, thereby minimizing the need to enter information twice, and reducing the possibility

for error. Importantly, because PPTS participants operate 85% of the U.S. liquids pipeline mileage, as of 2007, the PPTS/DIRT reporting mechanism has brought the operators of the vast majority of liquids pipeline mileage into DIRT reporting.

The general public, members of CGA, and state and federal regulators need to have a means of measuring progress in order to distinguish between activities that make us feel secure, and those that truly make a difference. While it may take a few years to develop a solid foundation, lessons learned should be shared to continuously improve the tool. In the meantime, we will continue our outreach to the public and other stakeholders in a permanent effort to improve systems to protect public safety and keep the nation's vital energy infrastructure operating.

Timothy Felt is the President and CEO of Explorer Pipeline Company. Mr. Felt currently serves as Vice Chairman of the Association of Oil Pipe Lines. He received his Engineering Degree from the U.S. Military Academy at West Point and served in the military for seven years. Additionally, he received his MBA from Pepperdine University in California.



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Mr. Archambault claims that although disagreements with TransCanada still occur, the relationship has grown and improved. The operator has responded to issues regarding pipeline markers, third party damage control, contact with local and state government, and respect for private property. After a request from the Office of Pipeline Safety (OPS) [now Pipeline and Hazardous Materials Administration (PHMSA)], TransCanada did several excavations of segments of the pipeline in order to allow OPS to

examine the pipe. An internal inspection was also conducted, resulting in the repair of a small dent. According to Mr. Archambault, TransCanada has improved its signs and markers, and has been more involved with the local community regarding pipeline safety issues.

"I would say we get along very well as land owners and pipeline operator. I know some of the people who work for the operator and we have made great progress in working towards better relations," Mr. Archambault said.

As a member of the surrounding community, Mr. Archambault's alertness to the right-of-way is imperative to pipeline safety efforts. "Glenn is a helpful advocate of protecting the integrity of our pipeline system in his community," said Robert Latimer, a TransCanada representative.

There are many other examples of landowners being proactive. Operators report instances of landowners calling after pump stations are hit by lightning and reporting illegal dumping over lines. Reports like these provide

valuable assistance to the pipeline industry's safety efforts, regardless of how unusual the activity. According to one operator, "We have had a landowner report a bob cat that had dug down on top of one of our lines."



In the Pipe thanks Glenn Archambault.

LESSONS ON DAMAGE PREVENTION FROM THE PPTS BY CHERYL TRENCH

Damage caused by excavation or other mechanical impacts to a pipeline is a core focus of pipeline safety efforts. For liquids pipelines, these incidents, while few in number, account for some of the worst consequences. This article uses information developed in the industry’s voluntary spill reporting system, the Pipeline Performance Tracking System (PPTS), to examine some of the characteristics of these incidents. PPTS, which first began collecting data in 1999, has allowed the industry to target its prevention strategies for these and other types of pipeline releases.

Third Party Damage in Hazardous Liquids Pipeline Releases

As shown in the table below, pipeline failures caused by damage from parties unrelated to the pipeline operator (“third party damage”) accounted for only 6% of the incidents recorded in PPTS from 1999-2005, but they accounted for far greater shares of the high consequence incidents. The incidents tend to be larger, and they are disproportionately associated with death and injury. Since 90% of these incidents occur along the right-of-way, not in a fenced facility, they put the public and others not associated with the pipeline at risk.

Who Does the Damage?

The industry has historically referred to these incidents as “third party damage,” with the thought that persons not involved with operating or maintaining the pipeline -- farmers, homeowners, construction crews and excavators, people who in the course of their normal activi-

ties may come in contact with a pipeline – were causing the damage.

Third Party Damage’s Role in Hazardous Liquids Pipeline Incidents, 1999-2005	
Third Party Damage Share of	
All incidents	6%
Total barrels released	27%
Fatalities	57%
Injuries	39%
Incidents involving a release of 50 barrels or more	23%
Incidents involving a release of 2,200 barrels or more (largest 2%)	29%

When it developed the survey for PPTS, the oil pipeline industry also recognized that similar incidents were caused by operators (“first party”) and their contractors (“second party”) that damaged the pipeline by excavation, digging and other impacts. A release caused by the pipeline operator or its contractor damaging the pipeline is classified as operator error in PPTS. PPTS data have confirmed since the outset that these operator and contractor incidents are an important part of the picture, as discussed below. Any prevention strategy will fail if it does not include the practices of the operator and its contractors as a target.

The shares of incidents caused by different excavation groups – in PPTS terms, “damaging parties” – presented new insight in targeting prevention strategies. For instance, farming activities cause more incidents than road work or other construction work. The recognition of the importance of farming activities led some operators to redirect prevention outreach especially in farming regions, holding county-by-county open meetings. The homeowner category is particularly important because the people doing the work may be less informed about the dangers of digging around a pipeline, or even to the presence of underground pipelines, than trained workers might be.

Who Does the Damage?

Because entities and individuals performing excavation tasks cannot know where underground facilities are located, one-call systems provide a central communication point for people who are going to excavate or dig to get information from the underground operators in the area about the exact location of the pipelines and other facilities. These state-by-state systems are paid for by the underground operators – liquids pipelines, gas transmission pipelines, gas distribution systems (mains and service lines), telecommunications and cable companies, etc. -- who are required by law to participate.

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ENHANCED STATE DAMAGE PREVENTION PROGRAMS IMPROVE SAFETY

In 2006 Congress passed the Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006 (PIPES Act of 2006). The bill recognized the effectiveness of the pipeline safety program and the success achieved by the industry and the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the Department of Transportation (DOT). The PIPES Act included provisions to strengthen federal and state oversight of damage prevention programs that were widely supported by the pipeline industry, the Administration, states and public interests. These provisions alone should yield significant benefit to the public as well as the industry since excavation damage related incidents are the leading cause of pipeline related deaths and injuries. The PIPES Act defined an effective Damage Prevention Program as one including the following nine elements:

- (1) Participation by operators, excavators, and other stakeholders in the development and implementation of methods for establishing and maintaining effective communications between stakeholders from receipt of an excavation notification until successful completion of the excavation, as appropriate.
- (2) A process for fostering and ensuring the support and partnership of stakeholders, including excavators, operators, locators, designers, and local government in all phases of the program.
- (3) A process for reviewing the adequacy of a pipeline operator's internal performance measures regarding persons performing locating services and quality assurance programs.
- (4) Participation by operators, excavators, and other stakeholders in the development and implementation of effective employee training programs to ensure that operators, the one-call center, the

enforcing agency, and the excavators have partnered to design and implement training for the employees of operators, excavators, and locators.

- (5) A process for fostering and ensuring active participation by all stakeholders in public education for damage prevention activities.
- (6) A process for resolving disputes that defines the State authority's role as a partner and facilitator to resolve issues.
- (7) Enforcement of State damage prevention laws and regulations for all aspects of the damage prevention process, including public education, and the use of civil penalties for violations assessable by the appropriate State authority.
- (8) A process for fostering and promoting the use, by all appropriate stakeholders, of improving technologies that may enhance communications, underground pipeline locating capability, and gathering and analyzing information about the accuracy and effectiveness of locating programs.
- (9) A process for review and analysis of the effectiveness of each program element, including a means for implementing improvements identified by such program reviews.

A number of states had already been working to improve their damage prevention programs. Descriptions of the Virginia and Texas programs follow:

Virginia: The nine elements from the PIPES Act are consistent with the program the State of Virginia has had in place since 1996 and have resulted in a significant reduction in excavation damage to pipelines. As can be seen from the charts below, over the 10 year period (1996-2006), the natural gas pipeline system in Virginia grew by

more than 31%, while the excavation damage to pipelines was reduced by 55% during the same period.

Although, all nine elements have contributed to Virginia's success, three of the elements are believed to have had the most impact. These measures include:

- Enhanced communication between operators and excavators. The exchange of accurate and timely information between the excavators and operators of underground facilities is at the heart of any effective damage prevention process. Virginia was the first state to implement the Positive Response System and require excavators to learn the status of their tickets by contacting this system before commencing excavation. The "three hour notice" is another opportunity for excavators and operators to ensure they are "talking" when unmarked facilities are noted in the field. The requirement for the center to re-notify operators when they have failed to respond to the system is yet another way to ensure additional communication when it seems that a request for marking has not been acted upon. Finally, the requirement for locators to add company specific letter designations and facility information when they mark the facilities is another way to better provide the excavators with information relative to a facility they need to protect from damage.

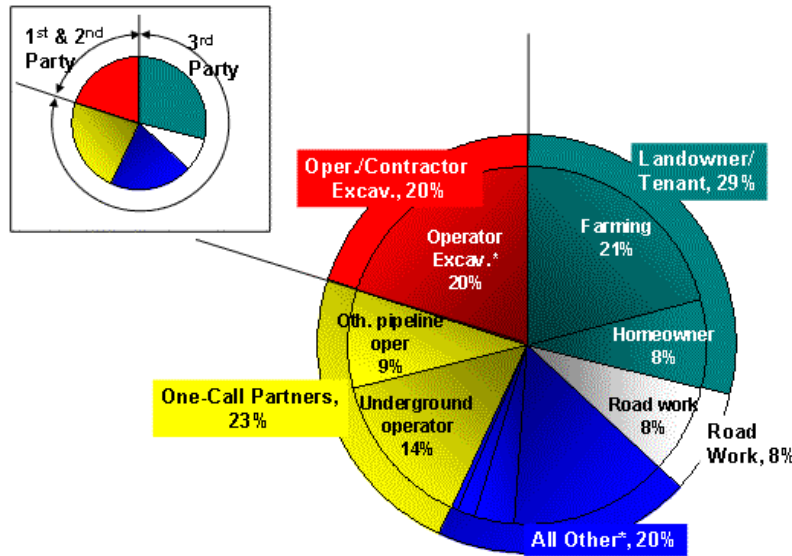
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Who Does the Damage?

Share of Incidents by Excavation Group, PPTS 1999-2005



All Other is residential/commercial development (4%), waterway activity (2%) and rail (1%), and activities that did not fit into other categories (14%).

[1] These details are based on a subset of incidents on which extra detail is collected: those involving releases of 5 barrels or more, or ones involving death, injury, fire or explosion.

Prior to beginning work, the excavator calls the one-call center, which in turn informs the underground operators in the area of the excavation plan. Each operator evaluates the dig location and either determines that its facility is outside of the affected area, or marks the exact location of the line. Liquids operators customarily communicate directly with the excavator.

One of the biggest new insights from PPTS was the number of incidents caused by entities that are actually involved in one-call programs. In the graph above, “one-call partners” include the types of operators who pay for one-call systems, the very entities that receive requests and send crews to mark the line. As shown, these types of entities actually caused 23% of the excavation damage incidents over the 1999-2005 period. The graph further illustrates that almost 10% were caused by “other pipeline operators” – gas transmission and liquids pipeline operators. In fact, some of the liquids operators could be participants in PPTS who hit another PPTS operator in the shared right-of-way. The fact that these operators who have common experience and common information, who are each developing prevention strategies, are also hitting their neighbors’ lines is one of many demonstrations that prevention is a complex issue.

Finally, the graph illustrates the role of operators and their contractors in these excavation-related incidents. In these, the PPTS operator reporting the incident or its contractor has damaged its own pipeline. They represent 20% of all excavation damage incidents – a number that PPTS participants are looking to reduce. As noted, PPTS

records these incidents as “operator error.” Again, the pipelines are actively engaged in fostering safety culture, and developing prevention strategies, so their involvement in these releases is a matter of concern to the industry.

The relatively frequent occurrence of these damage incidents caused by operators and their contractors has made them a high priority with the Pipeline Leadership. One element of prevention efforts is a new focus on managing contractors who are digging on the right-of-way, because PPTS shows that 70% of the operator/contractor incidents involve contractors. These figures lead us to question whether the incidents caused by other liquids pipeline and gas transmission operators also have high contractor involvement.

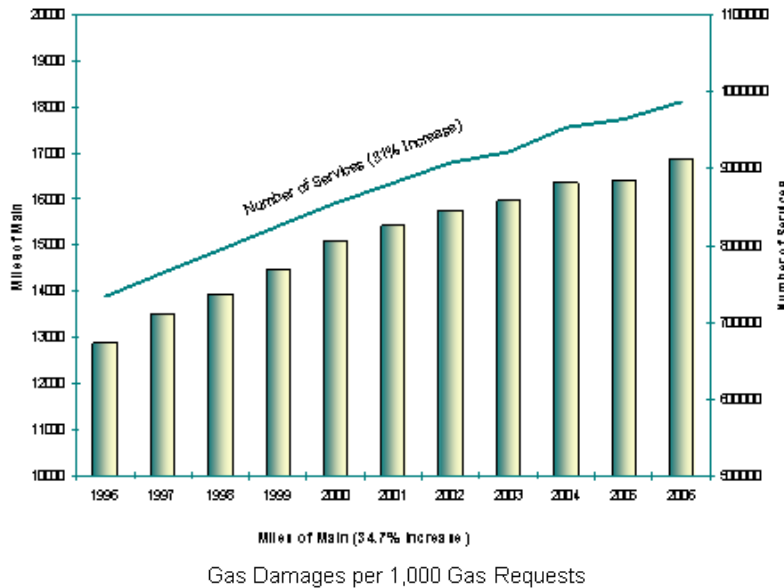
For the incidents involving third parties, PPTS also records whether the excavator notified one-call of the planned activity. Of significance is the fact that one-call was not used in more than 70% of the incidents. One-call partners used the one call system more frequently than other excavator types involved in releases, at nearly 60% of the incidents. In contrast, only 5% -- 2 out of 42 – incidents involving landowners (farmers and homeowners) included a one-call notification. The data suggest that even where one-call is used, a misstep may cause a release, another confirmation of the complexity of damage prevention.

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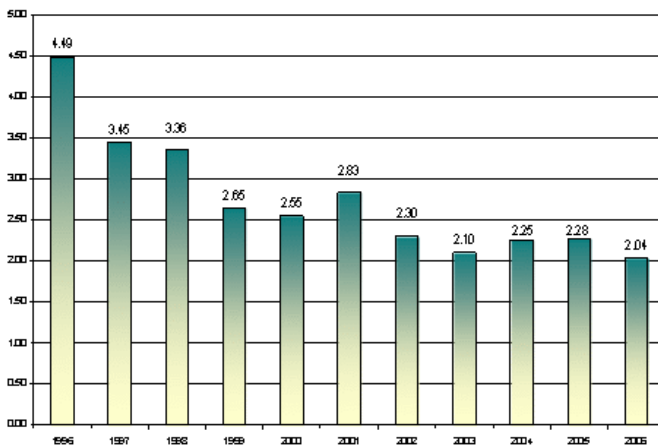
ENHANCED STATE DAMAGE PREVENTION PROGRAMS IMPROVE SAFETY

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Gas Distribution System Growth in Virginia



Gas Damages per 1,000 Gas Requests



- Efficient, fair and consistent enforcement.**

The results of investigations of damages and violations are reviewed by an Advisory Committee appointed by Virginia’s State Corporation Commission. This Committee is made up of representatives from excavators, operators, utility locators, notification centers, local government, VA DOT, Virginia Board for Contractors and Commission Staff. After a review of the facts surrounding each incident, the Committee makes enforcement recommendations that may include: civil penalty, civil penalty with training, warning letter, letter of concern, or dismissal. Every recommendation is made by considering factors such as circumstances that led to the incident, culpability, gravity, his-

tory of the violator, and other factors that may be justified. When civil penalties are necessary, a fairly complicated set of matrices guide the investigators and the Committee in recommending the appropriate level of civil penalties for settlement purposes while maintaining consistency. If applicable, a performance improvement credit is applied to reduce the penalty, and to therefore recognize a stakeholder’s overall performance. There are several opportunities for the involved parties to present their information and positions to the Committee outside a formal hearing. The Committee operates based on approved by-laws and strict policies to ensure the consistency and credibility of its process.

- Continued review of data to help evaluate and improve the program.**

Over the last 10 years, Virginia’s Commission has investigated more than 25,000 damages to gas facilities. The cause of every single damage incident has been identified by the Damage Prevention Advisory Committee. For every incident, important information is gathered and maintained in a single database at the Commission. In addition, the notification center is required to capture and maintain data relative to every notice of excavation and every utility response to these notifications. The combination of these two data bases has allowed Virginia stakeholders to review the trends and to take appropriate and focused actions to improve the program. For example, data is used to effectively plan and implement the statewide education outreach program. Data is also used to share trends with pipeline operators and devise plan’s to address problem areas.

In the Pipe thanks Massoud Tahamtani, Director, Virginia State Corporation Commission Division of Utility & Railroad Safety. More information available at <http://www.scc.virginia.gov/division/urs/index.htm>

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PIPELINE INDUSTRY TAKES A LEAD IN NATIONAL EMERGENCY PLANNING EXERCISE

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will be addressed. The third phase will consist of a senior leader's seminar that will examine the linkages between the NCP and the NRP incident management coordination structures.



Objectives

In addition to evaluating the implementation of the National Incident Management System (NIMS) and the National Response Plan, one of the

objectives of the exercise is to assess the effectiveness of interagency and private sector coordination in response to a major catastrophe involving multiple regions, states, and local jurisdictions. From the field level to the agencies in Washington, D.C., SONS tests the effectiveness of all levels of government working together with the private sector. The communication between these groups and their ability to conduct recovery, remediation, and infrastructure restoration effectively is an integral part of spill management response.

The industry's participation in exercises like SONS is a good example of working together with federal and local agencies, as well as local communities, to prepare for large scale emergencies.

For more detailed information on SONS 07, visit http://sons-program.org/SONS/SONS_07.nsf/



LEVERAGING PIPELINE DAMAGE PREVENTION TECHNOLOGY DEVELOPMENT

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such as fatigue, as illustrated by the catastrophic failure in Bellingham, WA.

The objective of this proposed research is to derive fatigue life related defect severity criteria for pressurized pipelines containing gouged dents using the nonlinear harmonic (NLH) method for detecting surface strain anomalies left in the pipe after gouging. The work will involve gouging pressurized pipes and performing full-scale cyclic pressure tests to failure while periodically inspecting the pipes using

NLH sensors. The proposed work will be co-funded by the Pipeline Research Council International (PRCI), with in-kind funding being provided by Tuboscope Pipeline Services who will develop software for implementing the derived NLH-based defect severity criteria in in-line inspection (ILI) equipment.

Effectiveness of Prevention Methods for Excavation Damage

The main objective is to develop a new fault tree model that will estimate hit frequency due to third-party

excavation based on pipeline condition and prevention practices. In addition to the evaluation of prevention effectiveness, this model can be used to facilitate the selection of the most cost-effective prevention methods, and to evaluate risk and reliability of existing or new pipelines.

PHMSA is bringing change through continued collaborative investments in prevention technology and by holding technology demonstrations so new industry tools reach intended users. For more detailed information on

the PHMSA R&D program see <http://primis.phmsa.dot.gov/rd/>.

LESSONS ON DAMAGE PREVENTION FROM THE PPTS BY CHERYL TRENCH

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Use of One-Call by Damaging Party Category, 1999-2005						
Damaging Party Type	Number			Share		
	No	Yes	Total	No	Yes	Total
Landowner	40	2	42	95%	5%	100%
One-Call Partner	13	19	32	41%	59%	100%
Road Constr/Maint	10	3	13	77%	23%	100%
All Other Parties	19	9	28	68%	32%	100%
Grand Total	82	33	115	71%	29%	100%

Landowner includes farming activities, homeowners and tenants, and those working for them; One-call Partner includes gas transmission, gas distribution, electric utility, telecommunications and cable; All Other Parties includes residential/commercial development, waterway activities, rail and "other."

PPTS also records information about depth of cover for incidents involving third party damage. Another insight gained from this information is that many of the incidents do not involve a shallowly buried pipe. For instance, in 37% of the incidents, more than 36 inches of soil covered the line. For incidents involving one-call partners, more than two-thirds occurred on lines that were buried deeper than 36 inches. Using this information, an operator should take more care to learn more about the excavation activity during the outreach after a one-call, making sure to be aware of whether a pipeline or telecommunication company was planning to use techniques such as drilling or boring, which tend to have a deeper penetration into the soil. In contrast, the landowner incidents tended to be shallower, with just 7% occurring at depths greater than 36 inches.

PPTS has allowed operators to hone their damage prevention activities with good results: incidents involving third party damage fell by 57% over the period 1999-2005. Compare this record with the much-touted decline in corrosion-related incidents, which fell by 63% -- only barely more rapidly -- over the same period. Even so, because the data demonstrate that these incidents have high consequences that often involve impacts to the public, communities and infrastructure, the industry has no choice but to continue to develop more effective strategies for prevention.

Cheryl Trench, President, Allegro Energy Consulting, consults with industry and government on a variety of issues relating to pipeline safety, including the Pipeline Performance Tracking System.

ENHANCED STATE DAMAGE PREVENTION PROGRAMS IMPROVE SAFETY

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Texas: In Texas, home to over 270,000 miles of underground pipelines, the Railroad Commission of Texas regulates pipeline safety for intrastate pipelines. The Commission was directed by the legislature to adopt rules to help enforce damage prevention laws relating to underground pipeline facilities. The new regulations were published in the Texas Register on June 15, 2007, with an effective date of September 1, 2007. The Commission is seeking the resources necessary to administer this program and help promote the use of the statewide one call number, and provide excavators and underground pipeline operators with best practices to make and receive notices, mark facilities properly, and dig with care in the vicinity of underground pipelines.

The highlights of the rule and the best practices adopted include:

All excavators digging deeper than 16", in the vicinity of a pipeline (excluding tillage) are required to call the one call. This removes some of the current exemptions for TXDOT.

The rule requires a positive response from the pipeline operator to the person making the call. If there is no response and/or there are no markings, the excavator is required to make a second call and wait an additional four hours.

The rule includes provisions for excavators' white lining projects to enhance underground pipelines' response time, and get a better idea of where the excavation will take place.

Creates a tolerance zone for marking.

Requires excavators to dig with care within the tolerance zone.

Provides common practices for how to mark facilities from the excavator sides, and the underground facility operator side.

Provides an opportunity for the excavator and the underground pipeline operator to work together to discuss the project and rule compliance (specifically digging techniques, duration of projects and marking issues, i.e. determining length of time marks are valid).

Rule adds definitions for length of time life for ticket, tolerance zone, and notification provisions.

Requires a self reporting tool for damages and violations to this rule.

Provides an enforcement tool to allow the Commission to penalize excavators and underground pipeline operators for rules violations.

In the Pipe thanks Mary McDaniel, Railroad Commission of Texas. For more information please visit <http://www.rrc.state.tx.us/rules/proposed.html>.

Excavation Damage Prevention Initiative (EDPI)

by Graham Hill, Ice Miller Strategies

The Association of Oil Pipe Lines and other industry partners* have created the Excavation Damage Prevention Initiative (EDPI). The purpose of the EDPI is to promote the development of a comprehensive consensus among excavators, underground facility owners, operators, safety advocates, state regulators, and the public, on the elements of the excavation damage prevention process as established in the PIPES Act of 2006. The EDPI will work in collaboration with the Common Ground Alliance (CGA).

The EDPI consensus building is led by Graham Hill of Ice Miller Strategies (IMS). Mr. Hill recently left his position as Staff Director and Senior Counsel to the Highways, Transit, and Pipelines Subcommittee of the Transportation and Infrastructure Committee of the House of Representatives. As a member of the Committee staff, Mr. Hill was the lead drafter and negotiator for the Committee on the past two pipeline safety reauthorization bills. His experience in pipeline policy and legislation, and his background with excavators and other excavation damage prevention stakeholders uniquely qualify him (and IMS) to support the EDPI.

Additionally, the EDPI will develop an advocacy strategy to help state stakeholders implement the appropriate modules consistent with the nine elements. In support of advocacy, EDPI will an information sharing mechanism that gives state stakeholders (local utilities, contractor associations, state regulators, etc.) all of the necessary information so they can work together to change and/or enact state legislation and/or regulations as needed. The legislative and regulatory modules as well as educational and advocacy materials will be available on the CGA website.

The U.S. Department of Transportation's criteria for states to be eligible to receive excavation damage prevention grants and for performance metrics for measuring progress in the nine point program will be critical to the success of improving excavation damage prevention process.

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ENHANCED STATE DAMAGE PREVENTION PROGRAMS IMPROVE SAFETY

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EDPI will convey best practices and other stakeholder recommendations to the Pipeline and Hazardous Materials Administration as they work to develop Section 134 program criteria and performance metrics.

NOTE: The EDPI consensus building is led by Graham Hill of Ice Miller Strategies (IMS). Mr. Hill recently left his position as Staff Director and Senior Counsel to the Highways, Transit, and Pipelines Subcommittee of the Transportation and Infrastructure Committee of the House of Representatives. As a member of the Committee staff, Mr. Hill was the lead drafter and negotiator for the Committee on the past two

pipeline safety reauthorization bills. His experience in pipeline policy and legislation, and his background with excavators and other excavation damage prevention stakeholders uniquely qualify him (and IMS) to support the EDPI.

** Stakeholders include API, American Gas Association, Interstate Natural Gas Association of America, and Associated General Contractors and National Utility Contractors.*

