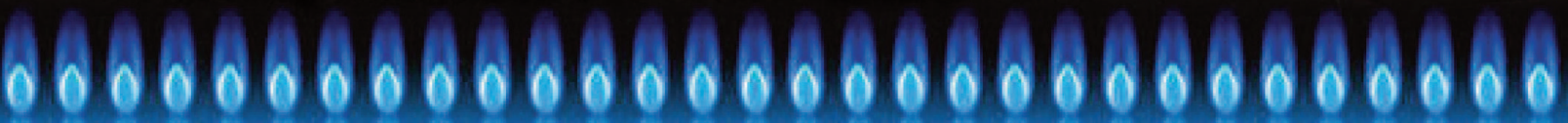


# TRENCHLESS

FOR GAS INFRASTRUCTURE

# 2026

**Breaking into the Northeast**  
**Piercing Tools**  
**Engineering a Steady Approach**  
**Planning Trenchless Gas Infrastructure**



# PLASTIC PIPE INNOVATIONS ALIGN WITH EPA PLAN AND PHMSA REGS Improved Materials and Products Driven by Safety Initiatives

The U.S. gas-distribution and transmission industry is at a pivotal juncture. Regulatory bodies are modernizing pipeline safety standards to incorporate new materials and technologies. At the same time, manufacturers and operators are advancing plastic, composite, and high-performance piping systems supported by data-driven safety initiatives. Together, these regulatory and technological shifts present opportunities to improve safety, reliability, and performance across gas infrastructure. And most importantly, they also align with the U.S. Environmental Protection Agency's (EPA) emerging FY 2026-2030 Strategic Plan.

The Plastics Pipe Institute, the major non-profit trade association, has information, data, technical reports plus case histories that can prove to be valuable to you. PPI's Energy Piping Systems Division - EPSD - also has Educational Options including:

- PPI eLearn courses
- YouTube shorts
- Customizable webinars
- Industry seminars

[www.plasticpipe.org/EnergyPipingSystems](http://www.plasticpipe.org/EnergyPipingSystems)



ENERGY PIPING SYSTEMS





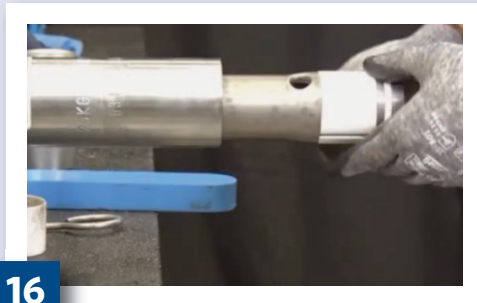
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Buried among the foundations of our nation, it should be no surprise that operating a utility system in the suburbs of Boston requires true stewardship. Having the right tools for the job makes accomplishing challenging tasks much easier.



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The trenchless piercing tool is a staple of the gas industry. It is hard to match the productivity and capability of these versatile tools. Piercing tools get put through the paces in upgrading existing gas systems, performing new service installations, and in conversions to natural gas.



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A critical transmission pipeline in Wyoming sustained damage and the company immediately restored service with a 51-foot repair. Limiting work to spot repair did not address the underlying geohazard, suspected to be continuing ground movement. Details on the comprehensive geotechnical investigation which followed.



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Cover photo courtesy: Richard Revolinsky, GEONEX, Inc.

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# WELCOME MESSAGE FROM NASTT-NE CHAIR

Charlie N. Tripp, P.E., BC.PLW NASTT-NE Chair

## GREETINGS MEMBERS AND INDUSTRY PARTNERS

**W**elcome to the latest edition of the NASTT Northeast Regional Chapter's *Trenchless for Gas Infrastructure Journal*. I hope you find the content within this publication to be both forward-thinking and practical. The NASTT-NE Chapter sincerely appreciates the continued support of our sponsors, whose contributions make this important publication—highlighting advancements within the gas industry—possible.

As we enter 2026, the Chapter continues its commitment to leadership transition and growth through our established two-year cycle of Executive Committee and Board roles. I am honored to step into the role of Chair for the 2026–2028 term and look forward to building upon the strong foundation established by prior leadership. With this transition, we also welcome new and returning members into evolving roles that will help guide the Chapter forward.


Our organization remains driven by volunteers, and we continue to have a strong need for industry participation, particularly from the gas sector—as we look to expand our educational offerings and better serve this important segment of the trenchless community. The Northeast Chapter is con-

tinually evolving, learning from past experiences, and striving to enhance both our publication content and annual programming. It is through the dedication of our members that we can provide meaningful educational and networking opportunities across our seven-state region.

Looking ahead, we are excited about upcoming industry events and continued engagement at both the regional and national levels. Participation in NASTT conferences and initiatives remains a valuable opportunity to connect with peers, share knowledge, and advance trenchless technologies. If you have not yet attended a NASTT event, I strongly encourage you to do so—you will find the experience both rewarding and impactful.

Planning is well underway for our 10th Annual Northeast Trenchless Conference, November 9 – 10 at the Saratoga Hilton

in Saratoga Springs NY – same site as the Northeast Gas Association's Spring and Fall Operations Conferences. I encourage you to join us at the conference and see the range of applications, cost savings, environmental and social benefits that trenchless technology offers to gas infrastructure construction projects. For more information on the conference and our Chapter, visit [www.nenastt.org](http://www.nenastt.org).

Thank you for your continued support of the Northeast Chapter and this publication. I look forward to working with many of you over the coming years and to the continued growth and success of our Chapter. 

*Charlie N. Tripp,*  
*P.E., BC.PLW*

NASTT-NE Chair (2026–2028)





JOIN US TO CELEBRATE OVER A  
DECADE OF TRENCHLESS SUCCESS

**BEAUTIFUL SARATOGA SPRINGS, NEW YORK**

# 10TH ANNUAL NORTHEAST REGIONAL CHAPTER TRENCHLESS CONFERENCE

**NOVEMBER 9 – 10, 2026**

**THE SARATOGA HILTON**

**534 BROADWAY, SARATOGA SPRINGS, NY 1286**

*Technical Demonstrations and Presentations on Trenchless Technology Applications for Water, Sewer, Stormwater, Gas and Power Transmission. Planning, Condition Assessment, Risk-based Engineering & Construction for Trenchless Projects and more!*



**For information and registration visit:**  
**[www.nenastt.org](http://www.nenastt.org)**



# TRENCHLESS TECHNOLOGY PERSPECTIVE

## REDUCING UNCERTAINTY & MITIGATING RISK WITH INNOVATIVE TECHNOLOGIES

George Ragula, RagulaTech Inc.

This ninth edition of Trenchless for Gas Infrastructure, explores several ways in which trenchless technology methods offer a complete set of techniques for gas distribution infrastructure construction, renewal and rehabilitation projects ultimately providing significant cost savings, safety improvements, and profound social and environmental benefits for our communities.

For many in the northeast and midwest regions, the longest coldest winter in recent memory is finally releasing its grip, revealing infrastructure damaged considerably from repeated intense freeze/thaw cycles. With winter now over, it's time for planning and taking a fresh look at how trenchless technology applications can come into play on those most difficult jobs. As you begin prioritizing the next list of the most pressing repair and new construction projects you might be surprised at how versatile and far-reaching the trenchless technology toolbox has become in recent years.

High level discussions and workshop presentations providing a birds-eye view of the many advantages of trenchless technology methods are always useful, however drilling down into the intricate details of designing individual construction projects is where the rubber meets the road. Usually, the most difficult and expensive pipes are left to replace last, so potential opportunities where trenchless technology can have the greatest effects might be right before your eyes! Trenchless technology methods harbor the greatest upside potential on the most challenging jobs: repairing the more inaccessible portions of the aging pipeline inventory, with pipelines in remote or difficult-to-access regions like bridges, under highways and major thoroughfares, railroads, golf courses, waterways, newly paved roadways and in those congested,

heavily trafficked areas that are considerably more difficult to repair and maintain.


Recent events have again demonstrated that volatile energy costs can create uncertainty in planning and designing gas construction projects. Difficult to manage, these unpredictable cost and logistical variables can largely be reduced with use of trenchless technology. Excavation and surface restoration costs associated with open-cut construction have soared in recent years causing significant pressure on project budgets that are already under severe constraints. With a much more compact surface footprint, projects utilizing trenchless applications are completed in less time with less equipment, dramatically reducing site restoration costs. This means that a much greater proportion of the project budget can be spent on more actual pipe replacement/repair lineage.

Every year the trenchless technology toolbox grows larger with an ever-widening range of practical applications as a growing body of real-world practical experience is acquired from trenchless infrastructure projects. Applications such as CIPL (cured-in-place lining), HDD (horizontal directional drilling), pipe-bursting and slip lining are well-established techniques used in gas construction projects, and the trenchless community is particularly adept at broadening the range and applicability of these construction methods filtering practical knowledge back into further research and development. A bigger and better toolbox.

For example, the trenchless application of Spray-In-Place-Pipe (SIPP) became well-established two decades ago as a preferred approach for the structural reinforcement and rehabilitation of man-holes and other large precast concrete structures such as retaining walls and cul-

vert headwalls. With further refinements, using innovations like centrifugal-casting spray crawlers, SIPP technology migrated into repairing large-diameter non-pressure wastewater pipe and eventually into smaller-diameter pressure pipe applications. Useful for both interior and exterior pipe repair and protection, SIPP is likely the next breakthrough trenchless technology for gas industry rehabilitation projects.

Networking, education, and sharing information are key drivers of this process, providing the focus and the foundation for this collective striving for continuous improvement. Awareness of state-of-the-art trenchless methods is key, along with the ability to successfully bridge the gap between innovations in the laboratory and practical implementation in the field. Moving R&D concepts and efforts into proven workable technologies in the ground requires industry champions willing to incur the risks necessary to push new technologies to the outer limits.

Education and training are the keys to successful implementation in the field. Organizations such as NASTT, GTI, NY-SEARCH and the AGA serve as catalysts for this process, and share a common goal of achieving ever greater quality and efficiency in gas industry construction techniques. Collaborative efforts among these organizations are paving the way for a brighter greener future for North America through the use of trenchless technology. It is exciting to see the benefits and advantages the gas industry can potentially achieve through the use of these construction techniques at the right time and on the right job. 

*George Ragula*

RagulaTech Inc.,  
NASTT Hall of Fame Member

# 2026

**AGA**  
American Gas Association

**OPERATIONS CONFERENCE &  
SPRING COMMITTEE MEETINGS** | **April  
26-30**

JW Marriott Tampa Water Street, Tampa, Florida

The American Gas Association's annual Operations Conference is the premier networking event for the natural gas industry. Join industry thought leaders to collaborate, share best practices, and drive innovation that promotes the safe, reliable, and cost-effective delivery of natural gas.

Register **HERE** for this two-day event, which will feature over 120 presentations covering the following topics:

- Engineering
- Emergency Management & Public Safety
- Gas Control
- Gas Utility Management
- Hydrogen
- Integrity Management – Distribution & Transmission
- Measurement – Distribution & Transmission
- Pipeline Safety Management Systems
- Piping Materials
- Renewable Natural Gas
- Underground Gas Storage
- Worker Health & Safety
- Workforce Development
- ...And More!

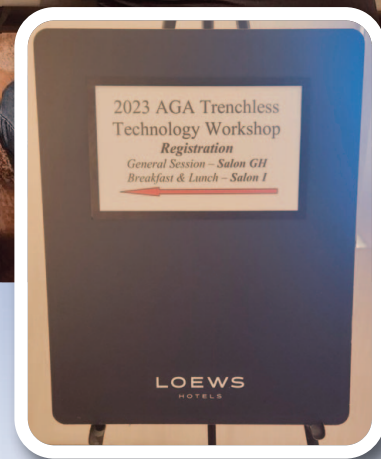


For questions, please contact Vicki Webster at [vwebster@aga.org](mailto:vwebster@aga.org) or LaMona Gray at [lgray@aga.org](mailto:lgray@aga.org)

[www.aga.org/events](http://www.aga.org/events)

**SAFETY & OPERATIONAL EXCELLENCE – ACROSS THE GLOBE!**

# AGA Trenchless Technology Workshop a Step Towards a Bright Future!



## First-ever AGA Event in 2023 Focused Exclusively on Trenchless Technology!

The first-ever AGA hosted workshop focused exclusively on trenchless technology was held at in Atlanta in 2023. Over 75 attendees took in 15 presentations and case studies covering trenchless applications used in new construction and rehabilitation of gas distribution systems. Networking events and close access to industry expertise was a highlight of the workshop.

Open to AGA members and non-members, the two and half day workshop was a unique opportunity to learn more about trenchless technology's useful toolbox of alternative construction and rehabilitation methods, such as HDD, CIPL, Pipe Bursting, Pipe

Splitting. Utilizing trenchless applications has numerous social, environmental and economic benefits, and offers significant reductions in GHG emissions.

The final half-day of presentations featured case studies on trenchless projects for gas distribution systems, highlighting a wide range of applications including HDD, CIPL and pipe splitting along with an in-depth discussion of cross bore risks and impacts.

As the success of the 2023 Atlanta workshop demonstrates, there is a strong desire for in-depth information on trenchless methods for the gas industry, and hopefully the first of many more to come. 🔥

# TRENCHLESS TECHNOLOGY & GAS 2026 UPCOMING INDUSTRY EVENTS

**MAY 7, 2026 - NJ**

**NASTT Mid Atlantic Happy Hour**

6:00 PM - 8:30 PM

Charlie's of Lincroft Restaurant

700 Newman Springs Road

Lincroft, New Jersey 07738

Information:

<https://nastt.org/training/upcoming-events/>

**MAY 20 - 21, 2026 - online**

**NASTT HDD Good Practices**

**Course - VIRTUAL**

11:00 AM - 3:00 PM (each day)

Information:

<https://nastt.org/training/upcoming-events/>

**JUNE 2 - 5, 2026 - RI**

**NGA 2026 Gas Operations School**

7:00 AM - 8:15 PM (June 2)

6:30 AM - 7:00 PM (June 3)

6:30 AM - 8:00 PM (June 4)

6:30 AM - 12:00 PM (June 5)

**Bryant University, 1150 Douglas Pike  
Smithfield, Rhode Island 02917**

Information:

[www.northeastgas.org](http://www.northeastgas.org)

**JUNE 16 - 17, 2026 - AB**

**NASTT Northwest Edmonton**

**Trenchless Symposium**

8:00 AM - 6:00 PM (each day)

Delta Hotels Edmonton Centre Suites

10222 - 102 Street

Edmonton, Alberta T5J 4C5

Information:

<https://s2.goshow.com/nastt/NW26/>

**AUGUST 4 - 5, 2026 - IL**

**AGA Strengthening Contractor**

**Partnerships Workshop**

8:00 AM - 12:00 PM (each day)

Gas Technology Institute

1700 South Mount Prospect Road

Des Plaines, Illinois 60018

Information:

<https://www.aga.org/events/>

**AUGUST 18 - 20, 2026 - TN**

**Global Damage Prevention Summit  
2026**

7:30 AM - 6:30 PM (Aug 18)

7:30 AM - 9:00 PM (Aug 19)

7:00 AM - 11:45 AM (Aug 20)

Gaylord Opryland Resort &

Convention Center

2800 Opryland Drive

Nashville, Tennessee 37214

Information:

<https://actsnowinc.com/globaldps>

**AUGUST 25 - 26, 2026 - AZ**

**Western Regional Gas Conference  
2026**

7:00 AM - 6:30 PM (Aug 25)

7:30 AM - 3:15 PM (Aug 26)

The Scottsdale Resort at

McCormick Ranch

7700 East McCormick Parkway

Scottsdale AZ 85258

Information:

[www.westernregionalgas.org](http://www.westernregionalgas.org)

**SEPTEMBER 21 - 25, 2026 - WI**

**National Association of Pipeline  
Safety Representatives Annual  
Meeting**

8:00 AM - 5:00 PM (each day)

Best Western Premier Park Hotel

22 South Carroll Street

Madison WI 53703

Information:

[www.napsr.org](http://www.napsr.org)

**SEPTEMBER 29, 2026 - MI**

**Midwest Trenchless Technology  
Conference**

8:00 AM - 7:00 PM (5:00 - 7:00 PM

Happy Hour)

Detroit Historical Museum

5401 Woodward Avenue

Detroit, Michigan 48202

Information:

[www.mstt.org](http://www.mstt.org)

**OCTOBER 14 - 15, 2026 - WA**

**Pacific Northwest Trenchless  
Technology Symposium 2026**

4:00 PM - 8:00 PM (Oct 14)

8:00 AM - 5:00 PM (Oct 15)

Seattle Airport Marriott

3201 South 176th Street

Seattle, Washington 98188

Information:

[www.pnwnastt.org](http://www.pnwnastt.org)

**OCTOBER 26 - 27, 2026 - NY**

**NGA 2026 Fall Operations  
Conference**

The Saratoga Hilton

534 Broadway

Saratoga Springs, NY 12866

Information:

[www.northeastgas.org](http://www.northeastgas.org)

**NOVEMBER 2 - 4, 2026 - AB**

**NASTT 2026 No-Dig North**

TELUS Convention Centre

Calgary, Alberta

Information:

<https://nastt.org/no-dig-north>

**NOVEMBER 9 - 10, 2026 - NY**

**NASTT-NE Northeast Trenchless  
Technology Conference**

4:00 PM - 8:00 PM (Nov 9)

8:00 AM - 5:00 PM (Nov 10)

The Saratoga Hilton

534 Broadway

Saratoga Springs, NY 12866

Information:

[www.nenastt.org](http://www.nenastt.org)

**MARCH 25 - 29, 2027 - NC**

**NASTT 2027 No-Dig Show**

Raleigh Convention Center

Raleigh, North Carolina

Information:

<https://nastt.org/no-dig-show>

# Breaking into the Northeast:

## GEONEX Helps National Grid Meet Project Goals Below MBTA in Braintree

By: Richard Revolinsky, Geonex Inc. (GEO)

**B**uried among the foundation of our nation is infrastructure as critical to our future as the words of the founding fathers. As America approaches her 250th birthday, and we look toward the future, National Grid does the same with their aging infrastructure to ensure the longevity of safe and reliable service to the region. National Grid (Grid) is one of the largest energy providers to millions in the Northeast and maintains a heavy book of projects to upgrade their assets. As part of Grid's commitment to long term management, Grid focused in 2025 on replacing a 12-inch gas main in Braintree MA with the installation of a new main below a high speed MBTA track.

The initiative to undertake the critical trenchless crossing ahead of planned work that would see the replacement of a much larger section of the 12-inch gas transmission main exemplifies the forethought to tackle the hardest parts first and then mitigate any potential delays in completing a larger project in the coming years.

The trenchless installation below the MBTA commuter rail tracks was required to avoid disruption to the daily transportation of a system that keeps the region moving. In June of 2025, trenchless contractor Henniker Directional Drilling (Henniker), based in Henniker NH set up and began performing a Jack-Bore installation. Soil investigations during design indicated the 6.5-foot-deep installation would go through sandy soils. During excavation of the Jacking pit, Henniker noted the presence of large cobbles and solid rock above the elevation of the installation. Working together, Grid, Henniker and the general contractor decided to attempt the Jack-Bore while working on a backup plan that could get through the rock as well as handle the anticipated ground water.

"We had 3 options if the bore failed. First, Henniker proposed using the GEONEX system for rock boring, as it was far less disruptive to the community and overall, more efficient. Second we were looking to move off the

*Operating a utility system in the suburbs of Boston requires true stewardship*

road, remove three railroad ties, vacuum excavate and if necessary, mechanically excavate under the tracks. That option would have required a service shutdown. The third option would have been a longer shutdown of train service, while we remove the existing tracks from the roadway, excavate and when complete have a new set of tracks installed,” said Mark Van Dam of National Grid. “Geonex was more expensive than jack-bore, but it would be a lot cheaper and better than the other two options.”

GEONEX is a total solution system. A hydraulic power pack is placed on grade near the launch pit and umbilical hydraulic and

compressed air lines are connected to the horizontal drill rig in the pit. The drill rig is controlled via remote control. Hydraulic cylinders allow for quick and efficient vertical and horizontal adjustments, so the pit floor does not need to be graded to perfection and there is no anchoring of tracks or a pouring of a thrust wall behind the rig. Hydraulic motors provide the force for the rack and pinion drive system, and a hydraulic rotary head provides the rotation force for turning auger and the down-hole hammer (DTH Hammer). Hollow stem, threaded auger is used to convey cuttings back to the launch pit and provide a means for getting

*Having the right tools  
for the job makes  
accomplishing  
challenging tasks  
much easier*



**Down Hole Tooling ready to begin**



*During auger boring at the outset, the casing waffled and the cutting head could barely turn*



## GEONEX is a total solution system

compressed air to the DTH Hammer. Peripheral cutting ring bits, center pilot-bit and start casings are unique to the GEONEX system enabling them to withstand the forces necessary to break the rock and pull the casing along the bore path with each cycle of the hammer. The specific design parameters of the GEONEX System allow for precise control and response to changing conditions making the complete system work harmoniously and efficiently to bore through solid granite, cobbles, boulders, clays and mixed face conditions with an astounding success rate.

With a back-up plan in place, the team proceeded with the proposed Jack-Bore, and as anticipated, it was unsuccessful. Jeff Martin, president of Heniker recapped the events: “We installed 6 feet before getting jammed up on the rock and couldn’t advance. We tried a few times to go further. The casing waffled and the cutting head could barely turn so we agreed it was time to call GEONEX in. They had already provided pricing on a rental unit and looked at the excavated material from the launch pit and were confident they could get it done.”

The total bore length was 160 feet. In order to retrieve the start casing and ring bit, a total of 170 linear feet of 16-inch steel pipe would be installed. From the face of bore pit to the zone of influence for the MBTA tracks was about 45 feet. For railroad operations, the work in the zone of influence, which was about 45 feet, had to be performed on a 24-hour basis. After that, the bore would continue another 70 feet to the receiving pit wall.

“Rich and the GEONEX team were able to mobilize and quickly set equipment up in the limited space,” explains Matthew Adam,

*The launch pit was located in a narrow strip of the roadway between single lane opposing traffic.*

Lead Project Manager at National Grid. Geonex arrived 1 week prior to review the site conditions and constraints with the project team, and delivering the start casing so it could be welded to the casing pipe off site, reducing the set-up time on site. The layout of all equipment was agreed upon. Work plans and anticipated production rates discussed, site hazards and safety measures identified, and inspection of the launch pit preparations confirmed the site would be ready to go the following Monday.

The project location required precise planning. The launch pit was located in a narrow strip of the roadway between single lane opposing traffic. One lane of traffic could be shut down during the work, but the contractor was required to maintain access to a business adjacent to the launch pit. Because the pit was in the middle of the road, and traffic flow would have to resume in both directions at the end of each shift, concrete barriers needed to be moved at the beginning and end of each day. The air compressor required to power the DTH-Hammer had to be moved each day, and with no place for spoils to be stored, access for a vac-truck was needed to remove spoils.

### EXCEEDING EXPECTATIONS:

The plan was to complete the bore within a week. Unfamiliar with how quickly the GEONEX system would chew through the rock, the work plan included sufficient durations and reasonable day-end goals to be achieved that allowed for unanticipated delays. The goal was to have the installation complete with the next section of casing welded on by the end of the day before enter-



**A new 12-inch gas main was installed below a high speed MBTA track.**

ing the MBTA Railway zone of influence. That would allow the following day to be utilized in its entirety to cross the zone of influence at which time normal working hours could resume, and the most critical part of the installation would be complete.

On Monday, September 22, the equipment arrived around 09:00 and 4 hours later, the equipment was assembled, placed in the launch pit, and the lead section of casing with the DTH-Hammer was lowered on to the frame. Using the hydraulic adjustments of the frame, at 14:00 the survey team confirmed the alignment of the lead casing allowing Henniker to begin installing the first section of casing. To ensure the installation follows the desired path the first casing is stopped several times within the first 20 feet to check alignment and slope and adjust the drill machine accordingly. This typically results in a longer duration for the first casing to be installed compared to later casings.

At 16:00 the crew completed installation of the lead casing section. Of the 20-foot length of casing, 17 feet was installed through the face of the bore pit, leaving the back 3 feet of the casing sticking out into the launch pit. This is done intentionally to allow the next casing to be aligned properly with the previous casing. Aligning casings is not just about closing the gap for welding but making sure the sides of the casing are straight across the joint to avoid putting a dog-leg, or bend, in the installation. Within an hour the crew was ready to resume boring and based on the success of the first 17 feet, the decision was made to push up to the zone of influence before stopping for the night. With 37 feet installed and only another 8 feet to go before reaching the



**Mixed face conditions were encountered throughout the installation**

zone of influence, the 3rd section of casing was welded on and pushed 8 feet before stopping. In just under 11 hours, the GEONEX equipment was delivered, set up, and used to install 45 feet of casing, 1 day ahead of the anticipated schedule.

The material encountered during the first 45 feet varied in composition. Upon removing the casing that was attempted to be installed by Jack-Bore, DGA was placed in the hole. Once through the DGA, the spoils coming from the rear of the casing represented a variety of hard rock rounded cobbles. Observing the landscape, it became clear that the installation was taking place in a natural low-point or valley, which became more evident as ground water volumes increased as the installation moved further toward the area of lower grade elevations. Material coming out was a gray, wet, and coarse with chunks of broken rock loosely held together with clay. On day 2, the material changed consistency with more rock and less clay. Increased ground water flowing through the casing at the head and out the tail end washed clean the pile of larger rock fragments removed from the casing by the rotating auger.

On the second day, installation began around 09:00 and the leading edge of the casing was within a foot or two of the railroad zone of influence. The 5th casing experienced heavy ground water which resulted in ponding of water in the launch pit. With GEONEX, excessive ground water is rarely a problem because the in-pit components are mostly hydraulic, and all electrical components are designed for submersion. Even if completely flooded excavations the equipment can be operated although flushing of the rotary head is recommended afterwards.



**Chains were used to rotate the casing in order to finish welding the sections**



By 14:45 on the second day, the first 120 feet was installed, placing the leading edge of the installation beyond the zone of influence. With daylight left to burn and pending inclement weather the next day that would prohibit the necessary lane closure to work at the launch pit, the decision was made to finish the installation that day.

Welding of the 7th casing proved difficult. A steady flow of groundwater was coming through the casing which posed a problem for welding the bottom of the casing. Geonex manufactures a water-tight weld ring that can be attached to the rear of the casing if Groundwater is anticipated, but this needs to be welded on prior to beginning the installation. Since Groundwater was not anticipated to be a problem for the installation the water-tight seals were not installed so the crew had to come up with another solution.

When using Horizontal Hammer Boring, the constant rotation of the auger results in transfer or rotational force to the casing when the shoulder of the pilot bit strikes the internal collar of the steel casing. Although this is not intentional, it can be beneficial, almost rifling of the casing in the bore hole. It is not uncommon to observe a full 360-degree rotation of the casing over a 20-foot length. If the casing rotates, it is an indicator of how straight the installation is.

The top 80 percent of the welding was complete, but the bottom could not be completed until the casing was rotated or the water stopped. Having observed rotation during installation, the GEONEX technician was confident that with light firing of the hammer and utilizing chains and an excavator, the casing could be rolled, placing the unfinished weld at the top, enabling completion of the weld. It worked, and by 16:00, the 7th casing was being installed.

Groundwater continued to flow clean through the casing. The hammer fragmented the rock depositing a pile of what looked like 2-inch clean stone in the bottom of the launch pit as the casing advanced. By the end of the 7th casing, the water had stopped, and, with 20 more feet, the head would reach the receiving pit.

At approximately 19:40 on the second day, the head reached the receiving pit 160 feet from the face of the launch pit. To re-



trieve the start casing, and provide a sufficient length of casing in the receiving pit, another 10 feet of casing would be welded on and pushed in.

Overall, 170 feet of casing was installed in 18 hours of boring and welding, averaging just under 10 feet per hour. The crew worked late that night to remove all auger and equipment from the excavations in preparation of the inclement weather coming Wednesday.

This project serves as an example of what can be achieved with proper planning, teamwork and having the details of a back-up plan in advance of performing the work. Having the right tools for the job makes accomplishing challenging tasks much easier, turning potential problems into success stories.

Matthew Abram of National Grid summarizes his experience with the project team and the GEONEX equipment, attesting to the success achieved. "Once the operations started, it broke through the rock with ease and performed more efficiently than we expected. Watching the equipment, which is all hydraulic, adjust vertically and horizontally to maintain the depth and centerline was very impressive. We are very happy with the outcome of the casing installation and the services provided by GEONEX and Henniker. National Grid will look to GeoNex in the future for any work requiring rock drilling." 💧



**With GEONEX, excessive ground water is rarely a problem**



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### ABOUT THE AUTHOR:

**Richard Revolinsky** is the North American Operations Manager for Geonex Inc. He has served the trenchless industry for the past 11 years in various roles as Project Manager for Auger Boring and HDD projects and material sales. He is committed to furthering the Trenchless Construction industry with viable innovative solutions.

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# Piercing Tools

## The Gas Industry's Trenchless Workhorse

By: TT Technologies, Inc.

**T**he trenchless piercing tool is a staple of the gas industry. In fact, the utilization of piercing in the gas industry over the last forty years has in large part been responsible for the acceptance of these tools in the general construction industry. Piercing tools are known by a wide array of names including mole, missile, hole hog, pneumo-gopher, and more. All of these tool names refer to a pneumatically operated tool that moves through the ground compacting the soil as it travels and leaves a bore hole behind it that some type of underground utility will be installed into.

Piercing tools get put through the paces, upgrading existing gas systems and performing new service installations. Conversions to natural gas are another component where trenchless piercing tools come into play. Piercing tools are versatile and provide gas utilities with an assortment of options for installing polyethylene (PE) services and mains.

### VERSATILITY IN THE FIELD

When it comes to field operations, it is hard to match the productivity and capability of piercing tools. Piercing tools are very economical on a cost per foot basis, especially when compared to a directional drilling application. The tools also offer a high level of accuracy and a range of pipe installations to meet almost any jobsite situation.

One of the most common installation methods for service lines and mains up to 2 inches in diameter is pulling the new pipe in place with the piercing tool's air hose. Basically, the crew completes the



***The piercing tool is a workhorse of the gas industry. Shown here, a Grundomat piercing tool is ready to go, in the launch pit, on a gas service installation project***

bore, removes the tool, attaches the new pipe to the air hose and then pulls the new pipe in place using the hose. Alternately, new pipe can be pulled in quickly and easily after the bore by attaching it to the front of the tool and reversing the tool out through the borehole.

Another way to install PE pipe is to at-

tach it directly to the piercing tool using a threaded PE pipe adapter. This is typically done with larger diameter pipe, from 2 through 6 inches in diameter.

In sand or loose soils that tend to collapse quickly, sometimes crews will pull in a larger diameter pipe, then insert the smaller diameter service or main into the



**A typical piercing tool gas service installation jobsite layout. Note the minimal disruption of the trenchless application**

larger pipe. The larger pipe can then be removed or left in the ground.

Finally, when installing small diameter pipe, 5/8-inch through 1 1/4-inch, the pipe itself can be used as the piercing

tool's air hose by utilizing an air nipple. By making the product pipe function as the air hose, the crew simply removes the tool once the bore is complete and everything is in place.



**Piercing tools are a staple in the gas industry for service line installations because they are trenchless and accurate**



The appeal of the piercing tool is strong in the gas industry. So, how do utilities keep these tools productive and running in tip-top shape?

## PROPER PIERCING TOOL OPERATIONS, CARE AND MAINTENANCE

According to piercing tool specialist Mark Schneider, from trenchless equipment manufacturer TT Technologies, Aurora IL, the key to long tool life and reliable service includes keeping the inside of the tool clean and operating it within the guidelines of the manufacturer. The Grundomat piercing tool specifically from TT Technologies, is designed to run at 95 psi. And should not be operated beyond that. While a higher psi can make the tool run faster, it also overworks the tool and can cause damage and void the warranty in some cases.

There are several maintenance procedures piercing tool operators should perform in order to meet those objectives and keep their tools running smoothly.

Sometimes doing some research before a bore is the best preventative maintenance. That begins with knowing the ground conditions. This includes knowing what the ground conditions are and making any equipment adjustments. It also means knowing how to operate the tool in different conditions.

Schneider said, "Sometimes crews get into granular soils that collapse, blocking exhaust air, stalling the tool and halting the bore. Pulling pipe in this case preserves the bore hole and completes the bore. Ground water is another issue. Ground water can hinder the performance of a piercing tool, and it can also dirty the tool up considerably. Being familiar with the challenges that each of these conditions pose is an important step to successfully completing the bore.

## COMPRESSORS, COMPRESSED AIR HEATERS & LUBRICATORS

Keeping the air compressor in tip-top shape will help keep your piercing tool running at peak performance as well. This

## It is hard to match the productivity and capability of piercing tools

is especially critical in cold weather applications. Draining the compressor of moisture is critically to preventing freeze up in all pneumatic tools, including piercing tools, during cold weather applications.

During cold weather using a compressed air heater can help mitigate frost build up and the impact on piercing tool performance. Several types are available, and Schneider suggests checking with the tool manufacturer for recommendations.

Many pneumatic tools, included piercing tools, also need to be lubricated during operation. Simply checking the lubricator before operating the tool is a good idea to help make sure things keep running smoothly. Petroleum based lubricants are very common and perform well in warm weather. Biodegradable lubricants are also common and perform exceptionally well in cold weather.

Schnieder said, "You want to make sure the oiler is full and operating properly before every bore. Prior to connecting the piercing tool to the air hose pour about a 1/4 cup of Grund-oil directly into the whip hose. Connect the air hose to the oiler, hold the end of the hose, then open the ball valve for approximately 30 seconds. You should be able to tell if lubricant is flowing through the hose. Very important."

### AIR HOSES

Checking air hoses on a regular basis is mandatory. Hose will fail, but regular inspection and proper upkeep can at extend the life of the hose. Visually inspecting hoses can go a long way in identifying potential problems, as well as safety issues. Making sure to blow dirt and debris out of air hoses before use is



**Ensuring proper lubrication during use is accomplished through an inline lubricator. Here, the operator checks lubricator operation before final piercing tool set up**

also a best practice. Lay out the air hose and blow compressed air through it before final hook up. Then test the tool above ground.

An ounce or two of air tool lubricant poured into the air supply line before connecting to the lubricator will ensure that the supply hose is properly coated and will allow the lubricator to immediately supply the lube necessary to for optimum tool performance.

Locking the couplers during use with a threaded locking ring or even duct tape helps ensure that one, the couplers remained locked together during a bore, and two, dirt and debris is kept out. A visual inspection of the seals on the couplers is also recommended to make sure that the tool is working at its best.

### CLEANING & SERVICE

According to Schneider, flushing the tool is one of the easiest, yet most effective maintenance procedures for a piercing tool. When boring in wet, sloppy soils, a lot of dirt and debris can be pulled into the tool. When left unchecked, that debris can cause performance and eventually wear problems with the tool.

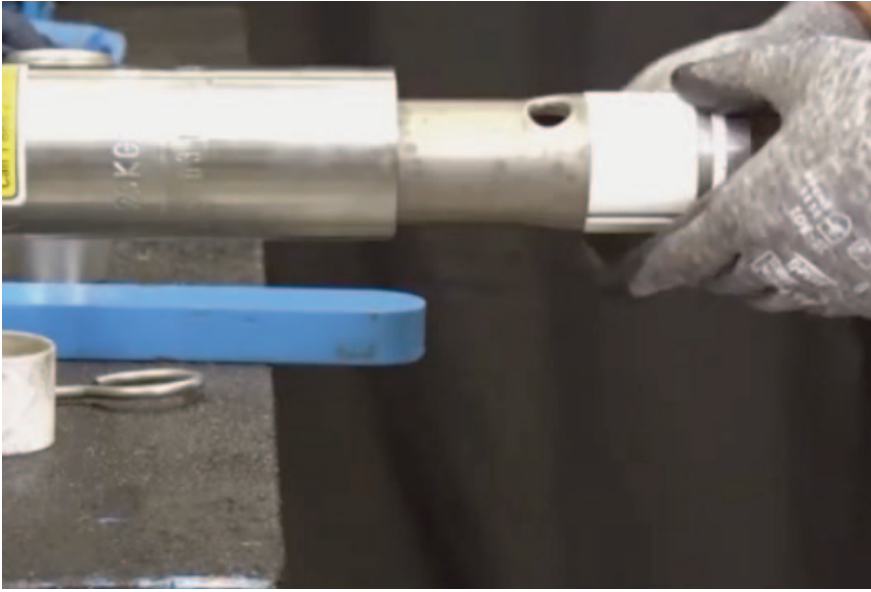
Schneider said, "To flush the tool you're basically pouring a cleaning agent into the air hose and running the tool above ground. You want to get all of the

debris out of the tool. Years ago, diesel fuel was the cleaner of choice. Not so much anymore. Most contractors use our environmentally friendly, bio-degradable lubricant to clean their tools."

Depending on the condition of the tool, the flushing procedure may need to be repeated several times. But afterward, a quick wipe down and the tool is ready for storage. Schneider also said while there is no preferred way to store a piercing tool, storing them vertically with the tool nose up, and back tilted down to allow moisture to drain is a best practice. And, with all tools, leaving them out in the elements will hasten their deterioration.

### MANUFACTURER RECOMMENDATIONS

According to Schneider, while each piercing tool operates on similar principles, each piercing tool manufacturer has its own recommended service and maintenance schedule. He said, "Some manufacturers suggest servicing the tool frequently, after every 30 hours of use. That includes disassembling the tool to check seal condition and spacing. Some types of plastic seals become elongated after use and can get to the point where they create resistance in the tool and need to be replaced.



**Seal inspection and replacement is part of regular piercing tool maintenance. Always check manufacturer recommendations for proper maintenance intervals**

“For TT Technologies Grundomat tools regular service and seal inspection intervals are longer, 400 hours. This can partially be attributed to different types of seals. Teflon seals have different wear properties than plastic seals and don’t re-

quire service as often. Again, it all comes down to reading your manual and seeing what the manufacturer recommends. This is often overlooked but can make a big difference in the performance and life expectancy of your piercing tool.” 🔥



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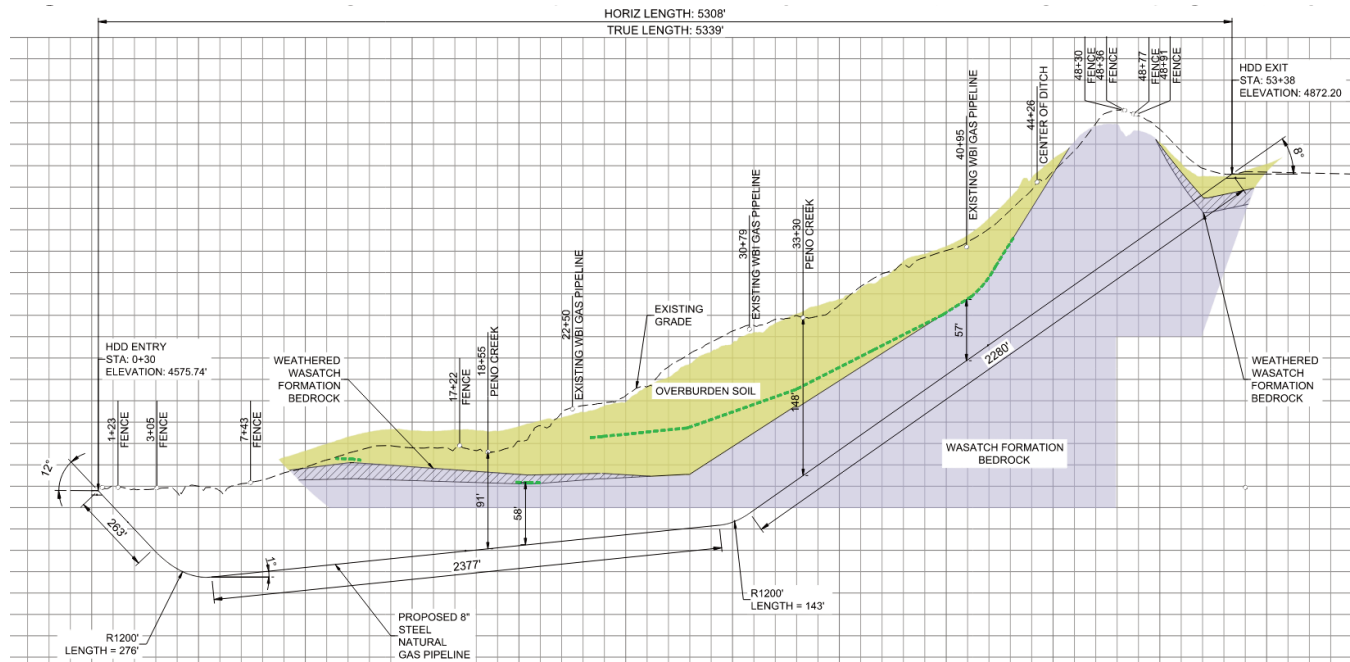
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# Engineering a Steady Approach: Trenchless Solutions in Unstable Ground

By: Billy Pacheco & Madeleine Zylberman, Burns & McDonnell



**Billy Creek HDD Profile**

## INTRODUCTION

The integrity of the natural gas pipeline system is paramount for WBI Energy Transmission. When a section of a critical transmission pipeline near Sheridan, Wyoming, sustained damage, the company implemented a 51-foot repair to restore service. However, the root cause — suspected to be natural ground movement — remained a significant and undefined threat. WBI recognized the need for an immediate repair to maintain customer reliability and also sought a long-term solution to mitigate the risk of recurrence.

The pipeline traversed the base of a mountain range where landslide movements were an active reality, evidenced by dramatic crevices in the earth and a washed-out state highway that was permanently closed and relocated. WBI engaged Burns & McDonnell for its Billy Creek project to engineer a long-term

solution by relocation or replacement. With traditional rerouting options off the table because of land constraints, an in-place solution capable of withstanding the subsurface forces was needed. The initial 51-foot problem soon revealed the need for a solution spanning over 5,000 feet to truly secure the transmission pipeline for the future.

*Integrity of the natural gas pipeline system is paramount*

## INVESTIGATION

The team's first priority was to understand the fundamental cause of the failure. This commitment to a true long-term solution, rather than a simple repair, launched a multiphase investigation that integrated geotechnical analysis with trenchless engineering from the project's inception. The unique challenge of analyzing deep, unstable soil required a

specialized geotech firm. The team vetted several companies, settling on one with experience monitoring and profiling subsurface ground movement in the region's difficult terrain.

The investigation proceeded in two phases. First, the team deployed a series of inclinometer standpipes installed in deep soil borings to measure subsurface movement over time. Inclinometers were installed in February, and readings were taken five times over six months. Guided by historical aeriels and on-site reconnaissance, the team strategically placed the seven inclinometers to define the horizontal and vertical limits of the ground movement. The goal was to identify the "slip surface": the critical boundary between the unstable, shifting earth and the stable strata below. Initial estimates for boring depths of 75 feet proved insufficient; some borings had to be extended to 100+ feet just to anchor the inclinometers in solid ground.



***Landslide movements were an active reality over a large area***

The data confirmed that the movement was happening over a considerable horizontal distance, revealing a massive,

***Traditional rerouting options were off the table because of land constraints***

active landslide area. The findings were dramatic, with soil borings uncovering organic matter like tree roots buried 79 feet deep in open fields, having slid off the mountainside over time.

**ATYPICAL DRILL GEOMETRY**

With a clear understanding of the hazard, the design phase began. The geotechnical investigation had determined that the new pipeline needed to be placed at least 30 feet below the identified slip surface (varies in depth, approximately 80 feet deep on average) to position the pipeline in stable soils. Given the varied depth and length required, horizontal di-



***Goal was to identify the critical boundary between unstable shifting earth and the stable strata below***

rectional drilling (HDD) was the only viable trenchless technology. The final design specified an 8-inch steel pipeline to be installed via an HDD crossing of 5,308 feet. To bypass the geohazard, the drill path reached depths of nearly 150 feet below the lowest natural ground elevation. This installation depth far exceeded that of a typical HDD but was a direct necessity dictated by the site's complex geotechnical conditions.

The team was challenged to engineer a drill geometry that would balance the need to remain sufficiently below the slip plane, reduce overall depth and account for 297 feet of surface elevation change from entry to exit. Instead of a typical HDD profile with a horizontal bottom tangent, the design incorporated an inclined bottom tangent to avoid depths exceeding 300 feet. Furthermore, the team completed an on-site constructabil-



### ***Suspected natural ground movement remained a significant and undefined threat***

ity review with WBI and identified that the initially planned HDD exit on the hillside would present challenges. The team instead recommended extending the drill path to exit in a flatter area, simplifying the pipe stringing and pullback process and reducing potential stresses on the pipeline during installation.

### ***Limiting work to a spot repair would have failed to address the underlying geohazard***

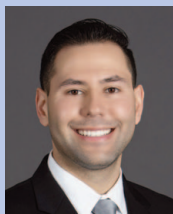
Once the preliminary bore path was established, a second phase of site-specific geotechnical investigation was performed to support the HDD design. This time, six soil borings were advanced as deep as 250 feet to gather the specific soil parameters needed for an inadvertent return analysis — a critical calculation to estimate the allowable pressure of the drilling fluid to avoid hydrofracture. The increase in soil bore depth beyond the preliminary bore path would allow the engineering team to adjust the design in the event of unfavorable soils. Additionally, this information provides the construction team flexibility in the event that cobble or other obstructions are encountered and drill profile adjustment is required during installation. During design, the project team also solicited constructability feedback from an HDD contractor to verify there were no red flags in the design.

## **CONCLUSION**

While construction is pending, the design for the Billy Creek project stands as a testament to the value of a proactive and integrated approach. Limiting work to a spot repair would have failed to address the underlying geohazard, leaving the pipeline vulnerable to recurrent failures. Instead, WBI and the Burns & McDonnell team made the investment to thoroughly understand the complex mechanisms causing the ground movement, which led to a robust and reliable long-term solution.

The project highlights several key lessons for the industry: the critical importance of early and thorough geotechnical investigation when facing geohazards, the value of an integrated design team that pairs trenchless experience with in-house geotechnical advisers (as well as consultation with HDD contractors), and the benefit of proposing a comprehensive solution that addresses the root cause of a problem. By confronting the challenge directly, WBI and its partners have developed a new benchmark for securing critical infrastructure against powerful forces of nature. 🔥

## **ABOUT THE AUTHORS:**



**Billy Pacheco** is an associate mechanical lead at Burns & McDonnell with experience as an engineering consultant in design and owner's engineer roles for the natural gas utility industry. His career focus has been in pipeline retrofits for inspectability, mainline valve (MLV) set replacement, remote control actuation of valve, backflow prevention, gas conditioning, regulator stations for transmission and distribution, and distribution main replacement. Most recently Billy has been serving as co-lead for the company's RNG technical team.



**Madeleine Zylberman, PE**, provides engineering oversight and technical guidance for both distribution and transmission pipeline projects in her role as technical manager at Burns & McDonnell. She has experience in planning, designing and permitting projects ranging in size and complexity for natural gas clients across the country. She specializes in trenchless crossing techniques and has experience designing and permitting complicated HDD and jack and bore crossings. Previously, Madeleine led the company's trenchless technical team and now serves as an accountability manager for the team.



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# Planning Trenchless Gas Infrastructure at Scale

## Lessons Learned From Complex HDD Mega-Projects

By: Phill Perron, MSc, PMP | The Crossing Group

**G**as utilities and pipeline owners are under sustained pressure. Aging infrastructure, decarbonization mandates, load growth driven by electrification and data centers, and increasingly congested urban and suburban corridors have collided at exactly the wrong moment. The result is a growing pipeline of trenchless gas projects that are larger, more complex, and more consequential than anything the industry managed a decade ago.

For project owners and utilities, this is no longer a contractor problem. The decisions made at the planning table, how scope is packaged, how risk is allocated, how supply chains are structured, how execution is governed, determine whether a project delivers on schedule or becomes a cautionary tale. The gap between owners who understand trenchless execution and those who treat it as a black box is widening, and the consequences are showing up in project overruns, environmental incidents, and regulatory delays.

What follows is a practitioner's view of what actually drives success on large-scale trenchless gas programs drawn from lessons learned executing some of the most complex horizontal directional drilling (HDD) scopes in North America.

### DEFINING THE SCOPE: WHEN 'BIG' BECOMES SOMETHING ELSE ENTIRELY

The trenchless industry lacks a formally codified definition of a mega-project. That gap matters, because the planning,

staffing, and risk management approaches that work on a ten-bore program simply do not scale to a hundred-bore program. The complexity is not linear, it is exponential.

A useful working definition of a trenchless mega-project is a program that exceeds typical parameters across multiple dimensions simultaneously: total bore footage exceeding 100,000 linear feet, more than 50 individual HDD crossings, contract values in the \$50M to \$150M range, multi-rig deployment across a geographically dispersed corridor, and multi-year duration with complex labor and jurisdictional requirements. The presence of multiple of these characteristics, not just one, is what triggers the need for fundamentally different program governance.

For gas infrastructure specifically, the challenge is compounded by the regulatory environment, the sensitivity of pipeline products, and the increasing frequency of urban and suburban corridors where conventional open-cut methods are either prohibited or impractical. Utilities are increasingly asking trenchless contractors to do more, longer bores, tighter tolerances, more complex product strings, while the window for execution narrows.

### THE PLANNING IMPERATIVE: STRUCTURE THAT SURVIVES THE FIELD

The most common failure mode on large trenchless programs is not technical, it is organizational. Projects of significant



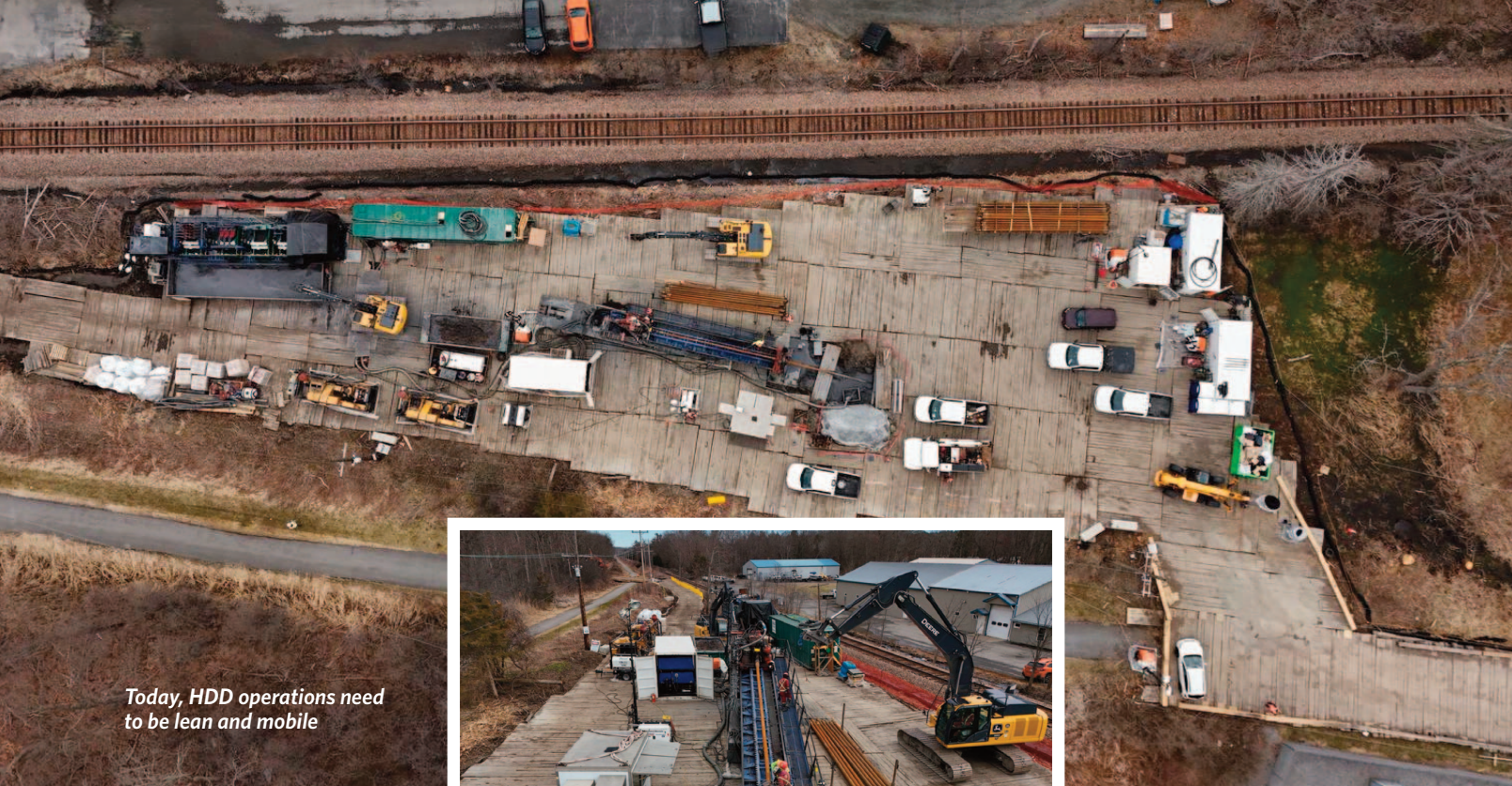
*In gas infrastructure construction, the ground is rarely cooperative*

scale, involving multiple rigs, dozens of crossings, and complex product handling requirements, cannot operate on tribal knowledge and ad hoc decision-making. But the opposite failure is equally destructive: rigid, over-engineered plans that cannot adapt when the field presents conditions that no desk-bound engineer anticipated.

The approach that has proven most durable is the development of a Master Execution Plan (MEP): a strategic governance document that defines how operations will be delivered without prescribing the means and methods of every individual bore. The MEP defines the battlespace, not the play-by-play.

In practice, this means establishing MEP Annexes for specific operational domains: pipe fusion, drilling fluid management, pipe handling and staging, logistics; and developing bore-level technical sheets that provide field crews with a framework for execution while preserving their ability to make intelligent, field-driven adjustments. The goal is to maintain engineering intent without enforcing rigidity that the ground conditions will eventually break.

For owners and utilities evaluating contractor proposals, this is a meaningful differentiator. A contractor who can articulate their execution governance structure: how decisions get made, how deviations are documented and ap-



Today, HDD operations need to be lean and mobile

proved, how field leadership is empowered within defined boundaries; is a contractor who has thought seriously about program delivery. The absence of that structure is a red flag, regardless of how competitive the pricing appears.

## SUPPLY CHAIN AS A STRATEGIC ASSET NOT AN AFTERTHOUGHT

The more effective model treats rigs not as isolated jobsites but as linked nodes within a larger sustainment ecosystem. Drawing on concepts from military supply chain doctrine, specifically the Joint Task Force Support Component framework used to sustain dispersed operations, the approach establishes a tiered logistics structure: central yards that hold strategic inventory, forward logistics bases positioned within operational reach of active bore zones, and tactical nodes that support individual rigs on a just-in-time basis.

But the physical infrastructure of yards and forward bases is only part of the picture. The more important discipline is the analytical work that precedes it: identifying what the program's true operational enablers are, centralizing those assets where it makes sense, and building the en-



tire logistics model around a single obsession, keeping rigs moving from bore to bore to bore with as little interruption as possible.

On a large HDD program, the enablers are not always the obvious ones. Drill pipe is visible. Rigs are visible. What tends to choke a program is everything that isn't: fusion equipment availability, drilling fluid additives, pit pumps, IR response kits, slings, rollers, bentonite inventory that doesn't run out on a Friday afternoon, tooling that doesn't have to be hot-shotted from a vendor four states away because nobody thought to stage it forward. Identifying those chokepoints in advance, by war-gaming the execution sequence before mobilization, not after the first rig goes idle, is what separates a logistics strategy from a logistics reaction.

The harder problem is human nature. Rig managers are experienced, tribal, and they have long memories. Every one of them has been burned by a supply gap at some point: a Friday afternoon with no bentonite, a pullback delayed because the right rollers weren't on site. The rational response to that history is to

hoard: to accumulate buffer stock at the rig, to hold onto equipment they might need, to self-insure against a logistics system they don't fully trust. The instinct is understandable. The

effect is exactly wrong. Hoarding anchors rigs. It adds weight, complexity, and administrative burden to operations that need to be lean and mobile. On a multi-bore program, a rig that can't move clean is a rig that loses days between completions. The answer is not to strip rig managers of their autonomy, it's to earn their trust by taking the supply problem off their plate entirely. That means identifying which enablers can be centrally managed and pushed forward on a reliable cadence, so the rig manager's job is to drill, not to requisition. When the logistics system is predictable, the hoarding instinct fades. When it isn't, no amount of program governance will stop it.

Central yards on a well-run mega-project are not warehouses. They are operational hubs with active inventory management, outbound staging, and the ability to push materials laterally to whichever bore zone needs them. The goal is continuous rig flow: the moment a rig completes pullback on one bore, the next pad, the next product string, and the next set of consumables are already staged and waiting. Every hour between bore

completions is a cost with no corresponding revenue. The program's logistics model should be designed to make that interval as short as operationally possible, and then shorter still.

The practical effects of this model are significant. Rigs can support one another laterally, sharing drilling fluids, tooling, and crew, rather than waiting for centralized dispatch. Deadstock is reduced. Hot-shots, those expensive emergency deliveries that signal a broken logistics chain, become the exception rather than the norm. Downtime, which is the single largest destroyer of project margin in HDD execution, decreases materially. For gas utilities structuring their trenchless programs, the implication is clear: supply chain design is not a contractor problem to be solved after contract award. It is a program design consideration that should be discussed during the bid phase and evaluated as part of contractor selection. A contractor who cannot describe their logistics model, including how they identify program enablers, how their yards are structured and staffed, and how they measure inter-bore cycle time, has not thought through what execution will actually require.

## RISK MANAGEMENT: THE RISKS OWNERS OFTEN MISS

Risk allocation is a defining feature of trenchless contracts, and gas utilities tend to focus on the risks they understand well: geotechnical uncertainty, IR events, regulatory shutdowns. Those risks are real and deserve rigorous treatment. But large-scale programs carry a category of execution risk that receives far less attention in contract design: the risk of structural misalignment between how the program is resourced and how it is sequenced.

Asset commitment without work commitment is one of the most reliably destructive failure modes in trenchless mega-projects. HDD rigs are high-cost assets. When rigs are mobilized before drill pads are permitted and prepared,



**Longer bores, tighter tolerances and more complex pipe strings are becoming increasingly common**

before right-of-way is confirmed, before the program has a ready-to-drill backlog, the result is idle time at full daily burn. On large programs with multiple rigs operating in parallel, idle time is not a minor inefficiency. It is a margin event that cascades into schedule compression, relationship strain, and contractor financial distress that ultimately threatens program delivery.

Vendor capacity is a related and frequently underestimated risk. Gas utilities often specify high-performance equipment and certified materials without verifying that the vendor community can supply them at program scale. When a program requires the same specialized fusion equipment across multiple active bore zones simultaneously, or when a critical tooling vendor has limited fleet availability, specification compliance becomes meaningless if delivery cannot follow. Vendors should be assessed for capacity and scalability, not just technical specification compliance.

Stop-start protocol ambiguity is a third risk that warrants explicit contractual treatment. Large trenchless programs operating across multiple regulatory jurisdictions face the possibility of project-wide shutdowns triggered by a single environmental or safety event. Without clear, pre-negotiated protocols defining what constitutes a work suspension trigger, who has authority to call a halt, and how standby costs are handled during suspensions, the result is fear-based decision-making that halts productive work at the first hint of ambiguity. Contractors will not commit full resources to a program where suspension risk is uncompensated and undefined.

## WHAT OWNERS SHOULD DEMAND AND WHAT THEY SHOULD PROVIDE

The relationship between project owner and trenchless contractor on a large gas infrastructure program is not a simple procurement transaction. The complexity of execution, the consequence of failure, and the duration of the work create a genuine partner-

ship dynamic, one that requires owners to bring more to the table than a scope document and a risk transfer clause.

Owners should demand execution governance from their contractors. Ask to see the Master Execution Plan, or its equivalent. Understand how the contractor makes decisions in the field, how deviations from plan are documented and approved, and how program leadership is structured across multiple concurrent operations. A contractor who cannot answer these questions in detail is a contractor who is planning to improvise.

Owners should also provide what contractors need to execute. That means drill pads that are permitted, prepared, and available when rigs are ready to mobilize. It means right-of-way that is confirmed before equipment arrives. It means a bore backlog that gives productive crews something to drill into rather than waiting for the program to catch up with itself. The single most effective thing an owner can do to protect their budget on a large trenchless program is ensure that rigs are never idle waiting for owner-side deliverables.

Finally, owners should engage key vendors early. Specialty vendors, fluid suppliers, tooling manufacturers, fusion equipment providers need visibility into program demand to plan capacity. A vendor who learns about program scale at contract award cannot ramp inventory and staffing in time to support mobilization. Early engagement, with commitment levels that give vendors confidence to invest in readiness, is a program design decision with direct impact on execution performance.



*Rigs are most effectively regarded as linked nodes within a larger supply chain*


## THE INFRASTRUCTURE MOMENT DEMANDS BETTER PROGRAMS

The North American gas distribution and transmission network faces a generational reinvestment cycle. Aging mains are being replaced. New distribution extensions are being built to serve load growth in areas that conventional open-cut construction cannot access cost-effectively. Transmission programs are threading through corridors of increasing sensitivity; environmental, regulatory, and community. Trenchless methods are not a niche solution for difficult crossings. They are increasingly the primary delivery mechanism for gas infrastructure programs of consequence.

The contractors capable of delivering programs at this scale, with the governance structures, logistics sophistication, and technical depth that large-scale execution demands, are not interchangeable

able with contractors capable of executing a small-bore program competently. The gap is real, and the consequences of selecting the wrong partner are visible in the project outcomes data across the industry.

Gas utilities and pipeline owners who take the time to understand trenchless execution, not at the level of drill bit metallurgy, but at the level of program governance, logistics design, and risk architecture, will consistently build better programs. They will ask better questions during contractor selection. They will structure contracts that protect them from the risks that actually materialize. And they will bring the owner-side discipline that transforms a technically capable contractor into a program that delivers.

The ground is rarely cooperative. The programs that succeed are the ones that planned for that reality before the first rig arrived on site. 



### ABOUT THE AUTHOR

**Phill Perron**,  
MSc, PMP, is

Vice President of Project Development & Delivery at The Crossing Group, a North American trenchless construction firm specializing in horizontal directional drilling and related trenchless infrastructure methods. He holds a Master of Science in Supply Chain & Logistics from the University of Hull and brings a decade of Royal Canadian Air Force logistics experience to trenchless program delivery. He presented this framework at the NASTT 2026 No-Dig Show and the American Gas Association 2026 Spring Committee Meetings.

# Kentucky Utility Benefits From PHMSA Mega Rule for High-Pressure Project

By: Steve Cooper, SCA Communications



*Installation went smoothly and none of the weak links or pipe were damaged*



**A** high-pressure gas pipeline completed by Henderson Municipal Gas (HMG) used pipe made from polyamide-12 (PA12), which is approved for use under the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) Mega Rule. The pipe is rated at 200 psi,

which can accommodate the pressure range HMG required.

The multi-stage project saw a total of 2,720 feet of the six-inch SDR 13.5 pipe manufactured by Teel Plastics, Inc. (Baraboo, WI) installed using trenching and horizontal directional drilling.

"This project marked the first PA12 in-

stallation under the PHMSA Mega Rule, which accepts PA12," stated Randy Knapp, Ph.D., engineering director of the Energy Piping Systems Division of the Plastics Pipe Institute, Inc. (PPI). "Prior to being incorporated by reference into the federal code, PA12 projects would require a special permit. Because an application would

*Two 750-foot-long sections of pipe were installed with HDD*



*The Mega Rule approved the use of plastic pipe for a greater range of high-pressure applications*

have to be filed for each individual project, the process was quite difficult and lengthy, requiring a coordinated effort between the pipe manufacturer, system designers, installers, state regulators and PHMSA. Naturally, this would take a lot of time and people. That is why the PHMSA Mega Rule is significant and highly benefi-

cial to utilities and their customers.”

PPI is the major North American trade association representing all segments of the plastic pipe industry.

PA12 is an innovative material suited for high-pressure gas applications and has been used internationally for years. In the United States, however, PA12 had pre-

viously been installed only via special regulatory waivers. The Mega Rule approved the use of plastic pipe for a greater range of high-pressure applications in the U. S., eliminating the waiver process for PA12 and making it available for wider use.

HMG was drawn to PA12 pipe with a 200 psi rating, primarily for its ease of in-



Pipe segments  
are fused easily  
in the field



***“The PA12 fusion process was much easier and faster than welding steel would have been.”***

***—Owen Reeves, P.E., Gas System Director, Henderson Municipal Gas***

stallation compared to steel. Considering all budgetary criteria for the project, the total installed cost for using the pipe was less expensive than steel. Plus, unlike steel, PA 12 does not require cathodic protection, saving extra labor, materials, and long-term monitoring.

“The PA12 fusion process was much easier and faster than welding steel would have been, saving HMG significant time and labor,” stated Owen Reeves, P.E. (PA) gas system director of Henderson Municipal Gas.

Located on the Ohio River, west of Louisville, Henderson has a population of nearly 30,000. Established in 1859, Henderson Municipal Gas is the fifth oldest system in the United States. It serves the natural gas needs of the City of Henderson, adjacent areas and the City of Corydon. It has 8,400 residential, 1,100 commercial and 50 industrial customers. Annual throughput is 3.1 billion cubic feet.

HMG installed the pipe through an industrialized area of the city. “The county and the city were able to acquire a grant to widen the roadway in one of our industrial sectors,” Reeves explained. “A lot of trucks and cars go up and down that road, and it was in poor condition. The issue was that the gas line was on the edge of the existing asphalt, and we didn’t want to be underneath the new, widened road.

“The existing line was steel, epoxy-coated pipe, which has been our traditional choice in the past if we were going to be above 125 psi,” he continued. “Steel pipe is what anyone would use for our conditions. Our concern was that there are probably a dozen or more building entrances on one side of the road and a dozen or more on the other side of the

road. The logistics were that some of these companies run three shifts, a lot of vehicles run up and down that road. The problem was how were we going to stage the epoxy steel pipe for welding, get it connected, x-rayed and get it in the ground. We didn’t want to block vehicles from the businesses.

“In this area, we operated at 90 psi with the prior pipe. We wanted the ability to go up to 200 psi in case there’s future expansion. We did consider 250 psi using PA12, but that pipe was significantly more money and we really didn’t need the extra pounds of pressure, so we stayed at the SDR that allowed for 200 psi MAOP.”

Reeves said that PA12 and PA11, had been talked about in the industry for a long time, and reflected, “It sure would be nice if we could get pipe that would fuse together in a faster manner. That would make the whole job much easier’.

“We called our state inspectors and said we would like to use PA11 or PA12,” he explained. “And because it had been used in other places, we asked them to take that into consideration because they had made special provisions for two other projects in the state. Those, however, were both four-inch projects. We wanted to increase to six-inch pipe as well as the higher pressure. They looked into it and said ‘yes, we can likely grant you a special exemption, but it will take 18 months for you to get it’.

“So, we decided to start the process and called around to get educated about the two different products. This included Teel and also the PA12 resin producer, Evonik. The bottom line is that PA11 comes from castor oil, which might be in limited quantities and there was really only one

manufacturer in the United States at that point in time, and they weren’t producing six inch. We felt the future would be with the PA12 so we decided to go with the PA12 pipe, if our timeframe could be met.”

“The use of PA12 in the United States continues to grow,” explained PPI’s Knapp. “Recently PHMSA published its “Periodic Standards Update II” in the Federal Register. This update to 49 CFR Parts 191, 192, and 195 incorporates 19 updated industry technical standards and clarifies provisions to maintain alignment with the latest materials and construction practices. By recognizing modernized standards, PHMSA continues to promote the use of improved materials such as advanced polyethylene, PA12, and reinforced composite piping systems.

“And this project in Henderson serves as an example of where and how PA12 can be a beneficial alternative to steel for future projects. It demonstrates that PA12 is a viable option as a high-strength alternative to steel that can save customers significant time, labor, and costs during installation.”

“The project went ahead on the fact that you can fuse PA12 together just like polyethylene (PE) which we’ve been using for quite a while,” continued Reeves. “It’s a little longer in time for the PA12, but the same type of equipment, same principle. That’s what made us go that route. We had three directional bores, one which connected two 750-foot-long sections of pipe and one that went across the road. The rest was trenching by a trencher and some areas we used a backhoe to excavate. We did a total of 2,720 feet.”

Teel provided a specially designed “weak link” mechanism to aid in the instal-

lation. These were used in each section of the pipe to help ensure that as it was pulled through the holes, the links would stretch or break in the event of a snag instead of stressing the pipe itself. The installation went smoothly and none of the links or pipe were damaged.

“This project demonstrates the benefits and costs savings of a new plastic pipe material that could open new opportunities to plastic pipe manufacturers as they seek to offer viable alternatives to steel,” offered David Fink, president of PPI. “It serves as a feature project that can be referenced in seeking the wider acceptance and prevalence of PA12 now that certain legal barriers to its installation have been removed. In short, the success of Henderson’s project helps blaze a trail for an innovative plastic pipe product.”

With a 200 psi rating, PA12 pipe benefited HMG as a steel pipe alternative. “Pulling steel pipe, the bored holes would have been more difficult,” Reeves stated, “and the welding required to join steel pipe sections would have required ad-

ditional manpower and prolonged time in the field. The PA12 butt fusion process HMG used was much easier and faster, saving HMG significant time and labor.”

Reeves estimated that welding steel pipe would have taken two to three weeks during the first phase of the project, while the PA12 butt fusion process took only about three days. Each fusion required only about an hour to complete, including alignment and placement.

“The job came in on time and under budget. We saved on the welding time that would have been done in the field and so we viewed it as a very good project. I would use PA12 pipe in a heartbeat anywhere under conditions that are more than 125 psi, less than 250 and where you do not have very many valves in the line.” Reeves stated. “If you’re putting in a main header, and going a long ways to serve a city far from existing infrastructure, I would not hesitate to use it.”

Additional information can be found at: [www.plasticpipe.org/energypipingsystems](http://www.plasticpipe.org/energypipingsystems)



Plastics Pipe Institute

ENERGY PIPING SYSTEMS

### ABOUT PPI:

The Plastics Pipe Institute, Inc. (PPI) is the major North American trade association representing the plastic pipe industry and is dedicated to promoting plastic as the materials of choice for pipe and conduit applications. PPI is the premier technical, engineering and industry knowledge resource publishing data for use in the development and design of plastic pipe and conduit systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods.

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# Trenchless Technology Innovations and Advancements:

## Advancing Pipe Renewal Technologies

By: Heather Rubin,  
RapiCure Solutions

**R**apiCure is advancing internal pipe renewal technologies with support from the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) with Contract #693JK32410015POTA. Its resin platform is compatible with multiple trenchless repair methodologies, including cured-in-place pipe (CIPP), cured-in-place liner (CIPL), spray-in-place pipe (SIPP) systems, and offers a new pig-in-place pipe (PIPP) option. These approaches enable corrosion mitigation and structural reinforcement of piping when combined with fiber-reinforced composites.

The company is further working to understand the challenges associated with prior SIPP technologies through a feasibility study conducted with support from NYSEARCH. NYSEARCH, a sub-organization of Northeast Gas Association, conducts voluntary research, development and deployment on behalf of 26 gas utilities located in the United States and Canada. NYSEARCH empowers natural gas industry leaders to identify and investigate research opportunities focused on product development and deployment, making delivery of natural gas safer, more reliable, clean and efficient. Benefits include high value for R&D dollars through collaboration and co-funding with other gas companies in NYSEARCH's membership and outside co-funders such as DOT/PHMSA, manufacturers and others.

An integral part of RapiCure's SIPP work is developing a PIPP solution, in which standard pipeline cleaning pigs are used to distribute resin uniformly along internal surfaces, followed by initiation via



**Patented high-performance polyolefin thermosetting resin redefines repair timelines**

thermal or UV activation. This approach minimizes reliance on extended heat cycles and specialized curing infrastructure. For example, a 12-foot pipe section can be fully cured in minutes, compared to curing times on the order of hours or days for conventional thermosets.

At the core of RapiCure's platform and supporting this R&D effort is a patented high-performance polyolefin thermosetting resin that redefines repair timelines and economics. Unlike traditional thermoset systems that require hours or days to fully cure, RapiCure utilizes frontal polymerization—a mechanism in which a localized thermal or UV trigger initiates a self-propagating reaction front. This cascade enables rapid, uniform curing within minutes, dramatically minimizing downtime and enabling faster return-to-service.

Building on this chemistry, RapiCure has developed its most field-deployable solution: the Medusa™ Tape & Resin Kits for external applications. The tapes are a composite pipe overwrap used for pipe-



**Composite pipe overwrap used for pipeline protection and repair**

line protection and repair for applications including bore wraps, soil to air interface, the protection of gas risers and more. Designed in collaboration with utility operators, these kits enable rapid plug, seal, wrap, and structural repair applications under real-world conditions. Engineered to meet stringent industry standards, including ASME PCC-2, the Medusa Kits combine ease of use with high-performance outcomes without large-scale heating equipment, translating into substantial cost savings through reduced labor and minimized operational downtime.

The Medusa system bonds effectively to steel, concrete, wood, and polymeric materials like PVC and HDPE, making it suitable for pipelines, utility poles, and structural components. It is engineered for application in challenging environments, including high humidity and wet conditions, eliminating the need for fully dry substrates prior to repair application. Performance remains consistent across a broad temperature range, from sub-zero conditions to above 275°F. 🔥

### ABOUT RAPICURE:



RapiCure has a strong history of incorporating advancements and innovations in their maturing technologies, including development of rapid-curing resins for infrastructure repair and protection. Learn more at [www.rapicuresolutions.com](http://www.rapicuresolutions.com) or reach out directly by email to [info@rapicuresolutions.com](mailto:info@rapicuresolutions.com).

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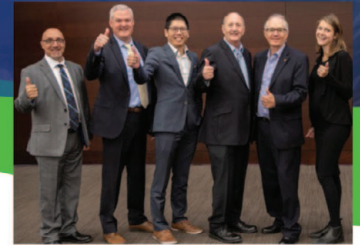
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# Field Culture Transformed — Exploring the Challenges, Benefits and Implementation of Elevating Field Culture

By: Dan Lorenz, P.E.,  
Joe Knows Energy

## EXECUTIVE SUMMARY:

*Elevating field culture in gas infrastructure is no longer a “soft” leadership initiative, it is a business imperative. As utilities and contractors navigate aging assets, increased regulatory scrutiny, workforce transitions, and rapid technology adoption, organizations that intentionally invest in field culture are seeing measurable results: safer operations, faster project delivery, reduced lifecycle costs, and more engaged teams.*

*This article explores Why an elevated field culture is important NOW, the Challenges organizations face in achieving it, and Path Forward including a practical roadmap for implementation.*

## WHY CULTURE ELEVATION IS URGENT NOW

### Several industry forces are converging:

- Accelerating infrastructure demand, driven in part by AI and data-center energy requirements
- Aging infrastructure requiring consistent, high-quality execution to minimize service interruptions and community impact
- Rapid technology adoption, including GIS-integrated planning, trenchless tooling advancements, digital as-builts, and remote inspection
- Heightened regulatory and stakeholder expectations around safety, environmental stewardship, and right-of-way management
- Workforce transition, as experienced craft professionals retire and new talent enters the field, making culture the glue that preserves institutional knowledge and sets performance standards

## CHALLENGES TO ELEVATING FIELD CULTURE

Transforming culture is difficult because it touches beliefs, incentives, tools, and daily routines. Common barriers include:

### 1. Undefined Target Culture

Most Utilities have articulated their desired Core Values. These Core Values are an essential part of the culture that is built. You cannot evolve culture if it is not clearly defined. Many organizations struggle to articulate what “good” looks like. For most companies, there is a target driven by Human Resources or executive teams. It’s important to understand how to translate this into the field. Some elements of a positive field culture include:

- Accountability and ownership within various roles and departments
- Collaborative spaces and opportunities to work together for common goals
- Transparency about issues, challenges, and wins, and
- Openness to change, learning, growth, and improvements

Start by understanding what your culture is supposed to look like – and what it looks like now. As a foundation, aim for a culture that emphasizes accountability, collaboration, and transparency within the framework of your company’s culture goals.

### 2. Resistance to Change

Veteran crews may view new processes as bureaucratic or untested, while new hires may lack historical context. Without a compelling “why” and trusted peer champions, adoption stalls.

#### What helps:

- Set clear vision of the benefits of the change
- Engage respected field leaders as co-designers
- Trust skill building training-see below
- Meet the field workers where they are, what they care about by clearly linking change to less rework, safer days, and simpler shifts
- Pilot in one district, prove value with metrics, then scale



*Elevating field culture in gas infrastructure is a business imperative*

### 3. Training and Upskilling Gaps

New technologies—digital planning tools, HDD tracking, NDE methods, QA/QC protocols—require intentional and ongoing skill development. One-time training rarely sticks.

**What helps:**

- Strategy to phase training based on the adoption curve, by having early adopters lead, train and mentor others
- Layered learning (pre-job briefings, hands-on practice, microlearning, post-job reviews)
- Certification ladders tied to defined competencies
- On-demand and virtual training to reinforce learning

### 4. Communication Gaps and Micro-Cultures

Design intent, permit constraints, and coordination details often break down between office and field, driving rework, delays, and risk.

**What helps:**

- Establishing a common cultural that all work to achieve, like the ACT (Accountability, Collaboration, Transparency) culture proposed in the "Elevating Field Culture" section below
  - Standardized pre-job packages
  - Simple two-way escalation channels
  - Daily pre-task, mid-day adjustment, end of day huddles. Following a Plan-Do-Check-Adjust model
  - Daily documentation of huddles, measure participation, impact and lessons learned.
  - Monthly culture (ACT) report that provides a trend analysis and lessons learned
  - Bi-monthly and semi-annual strategic review
- Culture change is frustrating at times and requires patience and strong leadership support. Even well-intended decisions can cause previous issues to occur if underlying systems are not addressed.

# Challenges

## THE PATH FORWARD: ELEVATING FIELD CULTURE

### **FIRST: It Begins with Trust Driven by Clarity and Alignment of Core Values**

Research from Harvard Business Review shows that trust is driven by core values that produce front-line leaders who are empathic, authentic, practice sound judgment, and technical competence.

The utility company, the owner of the desired culture, needs to ensure that all the team members including contractors, align with their core values. This ensures an empathic, authentic, and consistent work environment that promotes long-term culture goals.



*The Trust Triangle. Trust has three drivers: authenticity, logic and empathy*

### **SECOND: Defining New Cultural Goal-Accountable, Collaborative and Transparent**

Historically, the utility industry has rallied around a common “Safety Culture”. We believe that it is time that we build on the safety culture and set a new goal, one that supports the industry as it deals with the challenges listed above. An effective field culture promotes Accountability, Collaboration, and Transparency (ACT). This ACT culture is one where people at every level, especially frontline and project leadership, operate with shared ownership, open information flow, and disciplined execution:

#### **Accountable: Ownership Without Blame**

- Clear decision rights from boardroom to jobsite
- Commitments tracked around safety, quality, schedule, and compliance
- Issues surfaced early without fear
- Outcome: Faster corrective action and stronger regulator trust

#### **Collaborative: One System, Not Silos**

- Engineering, construction, QA/QC, and operations function as an integrated system
- Contractors and inspectors act as risk-reduction partners, demonstrated through early collaborative contractor engagement
- Frontline input shapes planning
- Outcome: Reduced rework and more predictable outcomes

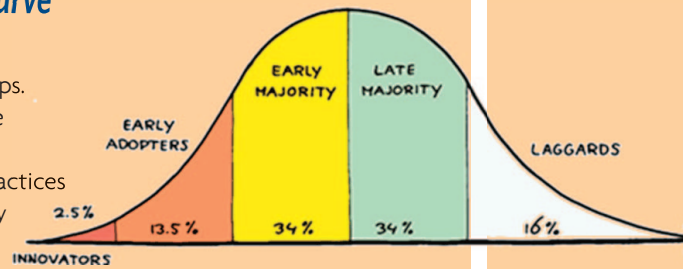
#### **Transparent: Truth Travels Faster Than Hierarchy**

- Real-time visibility into safety, quality, schedule, and cost
- Honest communication of risk and uncertainty
- Leadership models openness
- Outcome: Faster decisions and higher credibility

### THIRD: Understand the Technology Adoption Curve and How to Use it to Drive Change

For any given change, people generally fall into one of five groups. Research from The AI Driven Leader shows us that not everyone adopts change at the same pace

- **Innovators (2.5%)** – Willing to try first and shape best practices
- **Early Adopters (13.5%)** – Build momentum and credibility
- **Early Majority (34%)** – Adopt once value is proven
- **Late Majority (34%)** – Adopt once it becomes standard
- **Laggards (16%)** – Last to change



Adoption Curve: Not everyone adopts change at the same pace

Big change starts with small actions. Champions create “lightbulb moments” that turn every-day challenges into remarkable improvements, building momentum until adoption becomes self-sustaining. Having a strategy for each group helps in accelerating adoption. For example, have the early adopters act as coaches for the early majority.

### FOURTH: Understanding the Cultural Change Signals that Matter and How to Measure and Communicate Progress

#### Small signals accumulate into culture:

- Supervisors who ask operators, “What worries you about today’s plan?”
- Engineers who attend daily huddles and listen before advising.
- PMs who won’t trade safety for schedule.
- Crews who submit near-misses because they’re valued, not penalized.
- Create a mindset of “What” is the issue, not “Who” is the issue.
- Leaders who share real stories of risk avoided and craftsmanship celebrated.
- Documented ACT culture including frontline transformational leadership (FTL) at work

Consider these specific practices that signal a mature culture:

#### Before the First Shovel

- Constructability reviews that challenge assumptions: is this the right layout and use of various method here given geology and clear-ances?
- Right-of-way intelligence: complete utility locates, potholing where risk is high, and GIS overlays to visualize conflicts
- Risk-based planning: identify high-risk segments (e.g., river crossings, dense urban utilities) and assign contingency playbooks

#### During Execution

- Daily huddles: Pre-task, mid-day and post task, that start with safety and add quality, productivity and include hazards, weather, permit constraints, crew assignments, equipment checks etc.
- Real-time tracking & documentation of technical items but also culture elevation progress, including recording actions and impact of frontline transformational leadership
- Stop-work responsibility normalcy: crews pause when data doesn’t align with plan

#### After Completion

- As-built integrity: geospatially accurate records, test results, photos, and lessons learned feed a central repository
- After-action reviews: 30-minute debriefs capture what went right/wrong and convert it into standard work updates
- Trend analysis and strategic reviews for future implementation

# Elevating Field Culture

## FIFTH: Building Your Plan

### 1. Define the “Why” and Metrics

- Connect culture to safety, cost, schedule, and reputation
- Select leading and lagging indicators
- Establish ownership and measurement cadence

### 2. Co-Design with the Field

- Intentionally Build trust using your core values
- Pilot, test, and refine
- Phase training by using the technology adoption curve

### 3. Make Training Stick

- Blend classroom, field demos, and micro-learning
- Pair emerging talent with mentors
- Publicly recognize skill progression

### 4. Strengthen Communication

- Standard pre-job briefings
- Digital redlines and as-builts
- Clear escalation paths

### 5. Align Incentives and KPIs

- Balance production with safety and quality
- Celebrate stop-work decisions
- Tie incentives to learning and improvement

### 6. Institutionalize Learning

- Quarterly culture reviews
- Searchable lessons-learned repository
- Continuous updates to standard work

## CONCLUSION

*Building trust, fostering accountable, collaborative, and transparent teams, and measuring what matters are the forces behind exceptional gas infrastructure field performance. Elevating field culture doesn't just make work safer, it makes it smarter, faster, and more sustainable, delivering lasting value for crews, clients, communities, and customers. 🔥*



## ABOUT THE AUTHOR

**Dan Lorenz** P.E., Founder and President of Joe Knows Energy, has over 35 years leading construction, training, and inspection services companies. He is passionate about elevating safety and quality cultures with frontline professionals. Joe Knows Energy provides staffing, recruiting, and consulting services to the utility and energy industries. To find out more, visit their website: [www.joeknowsenergy.com](http://www.joeknowsenergy.com) or contact Dan at 614-989-2228 or [dan@joeknowsenergy.com](mailto:dan@joeknowsenergy.com).



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**Tom Decina, National Grid Director of Gas Complex Construction**

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# CASE STUDY: Legislative and Culture Changes in Nevada Helps to Minimize Damages to Utility Assets

By: Jay Rendos, Continuum Capital

*In 2024, Nevada received \$3.5 billion in Bipartisan Infrastructure Law funding to enhance communities across the state. The investment will help Nevadans build stronger communities. With any project that requires breaking ground, it's critical to protect the integrity of the existing utility lines that stakeholders depend on every day by implementing initiative-taking damage prevention procedures amidst growth. Coincidentally, since 2018, several legislative law changes have been approved. Significant law changes included Mandatory Electronic Positive Response and an improved definition of non-mechanical equipment. These significant law changes occurred based on the development of a coalition with 811 stakeholders. In addition to the legislative law changes, a cultural shift has occurred.*

## CHALLENGE: CULTURE SHIFT ADDRESSING DAMAGE PREVENTION

Nevada 811 stakeholders identified the need to address inefficiencies within a fragmented and adversarial damage prevention environment, where contractors, locators, and utility owners operated independently with limited communication. The industry was focused on liability avoidance rather than damage prevention.

Part of the challenge was updating legislation to address the non-mechanical excavation exemption and require these contractors to utilize the 811 system. Without this change, projects were often executed without awareness of subsurface utility locations, increasing the risk of damage.

Additionally, contractors struggled with the lack of a requirement for utility owners to provide a positive response confirming the status of their facilities. As a result, contractors frequently relied solely on visible paint markings and assumed that the absence of markings meant no subsurface utilities were present.

Together, these cultural and operational deficiencies created an environment where accountability was limited, communication was inconsistent, and damages persisted.

## SOLUTION: LEGISLATIVE CHANGES AND STAKEHOLDER CULTURE SHIFT

Historically, there was little focus on protecting underground infrastructure, especially during the construction boom in Las Vegas in the 1980s–1990s. Industry mindset was often “dig through it and repair it later”. Contractors, locators, and utilities frequently operated independently with limited communication. After the 811 Emergency Study was published, it motivated the Nevada stakeholders to re-evaluate current practices and identify areas for improvement. Stakeholders began examining where Nevada was performing well and where deficiencies existed.

To accomplish this, the Nevada Chapter of the National Utility Contractors Association (NUCA) founded the Damage Prevention Coalition. The group initially started as a contractor focused damage prevention committee but later expanded into a broader coalition. The coalition included contractors, utility owners, locators, trade associations, and other stakeholders. Goal was to bring all parties into the same room to address concerns collaboratively. Early meetings were contentious with significant finger-pointing between groups. However, overtime discussions shifted toward identifying problems and working together to solve them. Currently, the Coalition meetings include 80+ participants.

*“When end users have both a voice and a mechanism to resolve issues ... damages come down.”*

*— Dennis Bott, Regulatory Engineer, Nevada Public Utilities Commission*

## RESULTS: LEGISLATIVE AND CULTURE CHANGES IN NEVADA HELPS TO MINIMIZE DAMAGES

One of the first major legislative changes was the passing of Senate Bill No. 27. Previously, a dig ticket through USA North 811 was only required when mechanical equipment was used. The law was changed in 2023 to require a dig ticket for any excavation deeper than twelve inches. This change addressed damages caused by landscapers and others using hand tools. There was a significant decrease in landscape-related utility hits after implementation.

The next major legislative change was the passing of Regulation R115-4 that was approved in 2024. This law requires Utility owners to provide a positive response

confirming the status of their facilities (Mandatory Electronic Positive Response). Contractors must review these responses before excavation begins. Previously, contractors often relied only on seeing paint marks on the ground. Electronic Positive Response ensures utilities confirm whether lines have been located or cleared.

The passing of Regulation R115-4 and Senate Bill No. 27 has made a significant impact in the reduction of damages to utility infrastructure. The Electronic Mandatory Positive Response requirement has provided contractors, the 811 system end user, with improved communication on the status of locates and what specific utilities are in their project boundaries.

| Year | One-Call Center Tickets | One-Call Center Tickets (1,000s) | Change from Prev. YR | % Change from Prev. YR | Number of Gas Damages Reported | Gas Damages (10s) | Change from Prev. YR | % Change from Prev. YR | Gas Damages per 1,000 Tickets |
|------|-------------------------|----------------------------------|----------------------|------------------------|--------------------------------|-------------------|----------------------|------------------------|-------------------------------|
| 2000 | 103,365                 | 103                              |                      |                        | 1472                           | 147.2             |                      |                        | 14.24                         |
| 2001 | 107,785                 | 108                              | 4,420                | 4.28%                  | 1389                           | 138.9             | -83                  | -5.64%                 | 12.89                         |
| 2002 | 133,030                 | 133                              | 25,245               | 23.42%                 | 1495                           | 149.5             | 106                  | 7.63%                  | 11.24                         |
| 2003 | 161,360                 | 161                              | 28,330               | 21.30%                 | 1333                           | 133.3             | -162                 | -10.84%                | 8.26                          |
| 2004 | 175,075                 | 175                              | 13,715               | 8.50%                  | 1237                           | 123.7             | -96                  | -7.20%                 | 7.07                          |
| 2005 | 199,630                 | 200                              | 24,555               | 14.03%                 | 1200                           | 120               | -37                  | -2.99%                 | 6.01                          |
| 2006 | 204,485                 | 204                              | 4,855                | 2.43%                  | 1140                           | 114               | -60                  | -5.00%                 | 5.57                          |
| 2007 | 171,550                 | 172                              | -32,935              | -16.11%                | 768                            | 76.8              | -372                 | -32.63%                | 4.48                          |
| 2008 | 121,815                 | 122                              | -49,735              | -28.99%                | 550                            | 55                | -218                 | -28.39%                | 4.52                          |
| 2009 | 72,250                  | 72                               | -49,565              | -40.69%                | 346                            | 34.6              | -204                 | -37.09%                | 4.79                          |
| 2010 | 67,460                  | 67                               | -4,790               | -6.63%                 | 319                            | 31.9              | -27                  | -7.80%                 | 4.73                          |
| 2011 | 69,010                  | 69                               | 1,550                | 2.30%                  | 306                            | 30.6              | -13                  | -4.08%                 | 4.43                          |
| 2012 | 74,246                  | 74                               | 5,236                | 7.59%                  | 305                            | 30.5              | -1                   | -0.33%                 | 4.11                          |
| 2013 | 75,531                  | 76                               | 1,285                | 1.73%                  | 328                            | 32.8              | 23                   | 7.54%                  | 4.34                          |
| 2014 | 82,965                  | 83                               | 7,434                | 9.84%                  | 356                            | 35.6              | 28                   | 8.54%                  | 4.29                          |
| 2015 | 105,143                 | 105                              | 22,178               | 26.73%                 | 431                            | 43.1              | 75                   | 21.07%                 | 4.10                          |
| 2016 | 114,101                 | 114                              | 8,958                | 8.52%                  | 385                            | 38.5              | -46                  | -10.67%                | 3.37                          |
| 2017 | 129,991                 | 130                              | 15,890               | 13.93%                 | 398                            | 39.8              | 13                   | 3.38%                  | 3.06                          |
| 2018 | 138,910                 | 139                              | 8,919                | 6.86%                  | 431                            | 43.1              | 33                   | 8.29%                  | 3.10                          |
| 2019 | 150,593                 | 151                              | 11,683               | 8.41%                  | 341                            | 34.1              | -90                  | -20.88%                | 2.26                          |
| 2020 | 150,145                 | 150                              | -448                 | 0%                     | 341                            | 34.1              | 0                    | 0.00%                  | 2.27                          |
| 2021 | 169,737                 | 170                              | 19,592               | 13.04%                 | 365                            | 36.5              | 24                   | 7.04%                  | 2.15                          |
| 2022 | 193,807                 | 194                              | 24,070               | 14.18%                 | 337                            | 33.7              | -28                  | -7.67%                 | 1.74                          |
| 2023 | 200,720                 | 201                              | 6,913                | 3.56%                  | 307                            | 30.7              | -30                  | -8.90%                 | 1.53                          |
| 2024 | 224,999                 | 225                              | 24,279               | 12.10%                 | 347                            | 34.7              | 40                   | 13.02%                 | 1.54                          |
| 2025 | 226,737                 | 227                              | 1,738                | 0.77%                  | 299                            | 29.9              | -48                  | -13.83%                | 1.32                          |

Table 1: Nevada Gas Damages per 1000 Tickets

All owners must respond to the contractor if they have, or do not have, utility infrastructure within the project area. This Bill also included GIS access to one-call to consume assessor parcel/GIS data and improved ticket quality.

Contractors (mostly landscapers) using non-mechanical equipment for excavations are no longer exempt from calling 811 for their project. This legislative change increased the awareness of utility infrastructure locations for these types of projects and has had an impact in the reduction in utility damages.

Table 1 represents Nevada's Gas Damages per 1,000 Tickets (2020–2025). It shows a reduction from 2.27 (2020) to 1.32 (2025), supporting the approximately 42 percent improvement from 2020 to 2025, while statewide one-call ticket volume increased 34 percent over the same period.

One non-legislative improvement in the Damage Prevention process was the formation of the Nevada Damage Prevention Coalition. In the initial stages of the Coalition, there were several individuals who had differing opinions among the 811 stakeholders. According to Tyler Byrd, Owner, Byrd Underground: "Building trust between the 811 stakeholders was

***"When end users have both a voice and a mechanism to resolve issues... damages come down."***

***- Dennis Bott, Regulatory Engineer, Nevada Public Utilities Commission***

achieved through repeated, sometimes uncomfortable conversations discussing marking standards enforcement, sharing information about conduits, updated phone lists, response time accountability, partnerships, operational best practices, are some examples of the group coming together. This group has initiated a "cultural shift" for the damage prevention process from Liability Avoidance to Damage Prevention Collaboration." Collabora-

tion across stakeholders continues to drive improvements in damage prevention statewide.

## CONCLUSION

The "811 Emergency" study published by the Infrastructure Protection Coalition (IPC) highlighted \$61 billion annually in waste and excess costs embedded within the underground utility locate process. Harold Lefler, Damage Prevention/Safety Administrator, Western States Contracting, stated "The 811 Emergency Study brings attention to the significant costs of inefficiency within the system." The Nevada stakeholders have been working aggressively to improve the 811 process and have been successful in making improvements to reduce utility infrastructure damages. According to Dennis Bott, Regulatory Engineer, Public Utilities Commission of Nevada, "The biggest shift in Nevada has been cultural: we treat the excavator as the end user of the 811 process, and we've built a space where excavators can bring issues, questions, and expectations to the table and know they will be addressed. That has been reinforced by coordinated work across

## About IPC

The Infrastructure Protection Coalition (IPC) is a coalition of industry groups who represent regular users and stakeholders in the 811 system and want to see it run safely and efficiently. Members include:



**American Pipeline Contractors Association (APCA - [www.americanpipeline.org](http://www.americanpipeline.org))** – Founded in 1971, APCA represents merit shop pipeline and station contractors operating throughout the US constructing energy infrastructure.



**Distribution Contractors Association (DCA - [www.dcaweb.org](http://www.dcaweb.org))** – Founded in 1961, DCA represents contractors operating throughout the US constructing, replacing, or rehabilitating natural gas pipeline, electric cable, fiber optic cable, and duct systems.



**National Utility Contractors Association (NUCA - [www.nuca.com](http://www.nuca.com))** – Founded in 1964, NUCA represents contractors completing utility construction and excavation throughout the US in the water, sewer, gas, electric, treatment plant, telecommunications, and excavation industries.



**National Utility Locating Contractors Association (Nulca - [www.nulca.org](http://www.nulca.org))** – Founded in 1994, Nulca represents utility locating professionals operating throughout the US.



**Power & Communications Contractors Association (PCCA - [www.pccaweb.org](http://www.pccaweb.org))** – Founded in 1945, PCCA members construct electric power facilities, including T&D lines and substations; broadband facilities, including telephone, fiber optic, and cable television systems; energy infrastructure, including renewable power generation facilities and gas and oil pipelines; and water/sewer infrastructure of all types.

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## ABOUT THE AUTHOR:



**Jay Rendos** is a consultant with Continuum Capital, which provides management consulting, training, and investment banking services to the worldwide energy, utility, and infrastructure construction industry. Jay brings over thirty years of experience and works primarily with gas/electric utilities, power generators, pipeline companies, and energy companies to support the planning, design, construction, and operation of capital assets. He is a recognized expert in both natural gas utility construction, operations, and maintenance along with power generation facility construction and operations including very specialized experience in reduced and no carbon emission facilities powered by natural gas, nuclear, or renewable sources.

NRCGA, NUCA, USA North 811, utility owner-operators, and the Public Utilities Commission of Nevada. We also backed the relationships with practical tools — for example, Nevada’s electronic positive response dispute ticket type gives excavators a defined way to dispute an EPR response and requires follow-up when there is a concern. When end users have both a voice and a mechanism to resolve issues, communication improves, commitments become real, and damages come down.”

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# Why Utilities Are Adopting Trenchless Split and Pull for Service Pipe Replacement

By: Dennis Jarnecke, GTI Energy

*Utilities across North America are facing a fundamental shift in how service line replacement programs must be executed. Escalating construction and restoration costs, aging infrastructure, evolving customer demand, and heightened regulatory expectations are converging to make traditional open-cut excavation increasingly unsustainable at scale.*



**Reducing surface disturbance is a financial imperative**

**In** this environment, trenchless split-and-pull pipe replacement—particularly when paired with minimally invasive excavation techniques such as keyhole pavement coring and vacuum excavation—is emerging not simply as an alternative construction method, but as a strategically necessary approach. For utilities responsible for multi-year, system-wide pipe replacement programs, the choice of construction methodology now carries long-term financial, operational, and public engagement implications.

## ESCALATING EXCAVATION AND RESTORATION COSTS ARE REDEFINING ECONOMICS

One of the most pressing drivers behind the adoption of trenchless technologies is the rapidly rising cost of excavation and surface restoration. Open cut construction, especially in paved or urban environments, imposes costs that often exceed the cost of the utility work and the value of the utility asset being replaced.

Costs associated with traffic control, pavement saw cutting, trench excavation, spoil handling, and full surface restoration have all increased sharply in recent years. In many jurisdictions, restoring asphalt or concrete to municipal standards often requires full width or lane level restoration. Moreover, these restorations may introduce long term pavement degradation, creating weak points that drive future

maintenance costs for both municipalities and utilities.

As utilities scale service replacement programs from dozens of services per year to thousands, these restoration liabilities compound rapidly. Reducing surface disturbance, therefore, is no longer a convenience—it is a financial imperative.

## AGING INFRASTRUCTURE AND GROWING DEMAND REQUIRE SCALABLE SOLUTIONS

Much of the existing utility infrastructure in service today was installed decades ago using materials that are nearing their intended service life. Legacy plastics, bare steel, and other outdated materials are increasingly susceptible to leaks, corrosion, and mechanical degradation.

At the same time, customer demand profiles are changing. Residential and commercial customers are adding higher-load appliances, such as natural gas backup generators, pool heaters, and commercial equipment, which frequently necessitate larger-diameter or higher-capacity service lines. Utilities are also responding to evolving safety standards, including excess flow valve (EFV) requirements and proactive replacement mandates driven by system-integrity and risk-reduction goals.

As a result, service replacement is no longer a reactive activity—it has become a sustained, programmatic effort requiring consistent, repeatable, and cost-controlled construction methods. Traditional



paired with keyhole coring become even more compelling:

For many utilities, the ability to avoid full-lane or full-width pavement restoration represents the single largest source of long-term cost savings.

- **Significant Reduction in Restoration Costs:** Small, circular pavement restorations replace extensive trench repairs, dramatically lowering material, labor, and traffic-control expenses.
- **Extended Pavement Life:** Minimizing cuts reduces long-term degradation, eliminating weak points that may drive future municipal complaints and repairs.
- **Reduced Public and Customer Disruption:** Roads, sidewalks, driveways, and landscaping remain largely intact, improving customer satisfaction and reducing complaints.
- **Faster Installation and Restoration Cycles:** Smaller work zones enable quicker completion and improve crew productivity.
- **Lower Total Cost of Ownership:** When excavation, restoration, traffic management, and lifecycle pavement impacts are considered, trenchless replacement consistently outperforms open-cut methods.



*Trenchless split and pull replacement is paired with minimally invasive excavation and restoration techniques*

## DEMONSTRATED PERFORMANCE BUILDS CONFIDENCE

GTI Energy has been working with gas utility operators to coordinate field demonstrations to validate the practicality and reliability of split-and-pull service replacement under real-world conditions. Notably, projects recently conducted by Southwest Gas using the Utilicor KPS-8000 system demonstrated that services could be replaced safely and efficiently while dramatically reducing the surface footprint compared to traditional trenching.

These demonstrations confirmed that crews could maintain safety standards, meet installation tolerances, and significantly simplify restoration activities—all while operating within live utility environments. The reduced need for pavement repair proved to be a standout benefit, reinforcing the long-term financial and operational advantages of the approach.

When deployed in conjunction with keyhole pavement coring, these results indicate a clear pathway to reducing total replacement program costs while minimizing community disruption.

### **Split-and-pull transforms the economics and constructability of service replacement programs**

trenching, when applied at this scale, introduces unacceptable cost volatility, disruption, and public impact.

## WHY TRENCHLESS SPLIT AND PULL MAKES SENSE

Trenchless split-and-pull technology directly addresses these challenges by replacing existing service lines along their original alignment without continuous open-cut excavation. The process fractures the existing pipe in place while simultaneously pulling in a new service line, preserving grade and alignment, and re-

ducing the impact on adjacent utilities.

When combined with keyhole pavement coring and vacuum excavation, split-and-pull transforms the economics and constructability of service replacement programs. Instead of long trenches, crews work through small, precisely cored access points—typically 18 to 24 inches in diameter—that allow for utility daylighting, pipe splitting, service reconnections, and final restoration with minimal surface disturbance.

When evaluated at a program level rather than on a single-job basis, the benefits of split-and-pull replacement



**LEFT: Existing service lines are replaced along their original alignment without continuous open-cut excavation. RIGHT: Typical service-splitting equipment.**

### LOOKING AHEAD

As utilities confront the combined pressures of rising costs, aging infrastructure, and increasing customer expectations, the limitations of traditional construction methods are becoming increasingly apparent. Trenchless split-and-pull replacement—paired with minimally invasive excavation and restoration techniques—offers a resilient, scalable solution aligned with modern utility priorities.

This approach does more than reduce immediate project costs. It preserves roadway assets, improves public perception, supports faster program execution, and provides a defensible, regulator-ready strategy for infrastructure renewal.

For utilities committed to delivering safe, reliable service while controlling long-term costs, trenchless split-and-pull is rapidly transitioning from an alternative construction practice to the industry's best practice. 🔧



### ABOUT THE AUTHOR:

**Dennis Jarnecke** is Senior Director Research & Development with GTI Energy, and has

been involved in the Gas Industry for 30 years. His experiences have spanned various aspects of the natural gas industry; from distribution to transmission. Responsibilities include formulating, developing, and managing research and development programs to meet operational efficiencies, cost reductions, safety, and environmental improvements. He also leads various consulting engagements with utility companies focusing on compliance, risk mitigation, best practices, and hydrogen blending initiatives.

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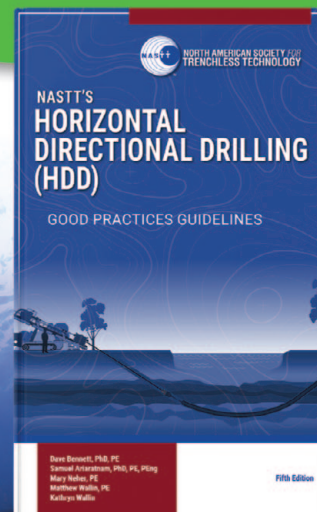
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