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2020 SPECIAL EDITION: LOCATE

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ONE CALL
SPOTLIGHT

OHIO811
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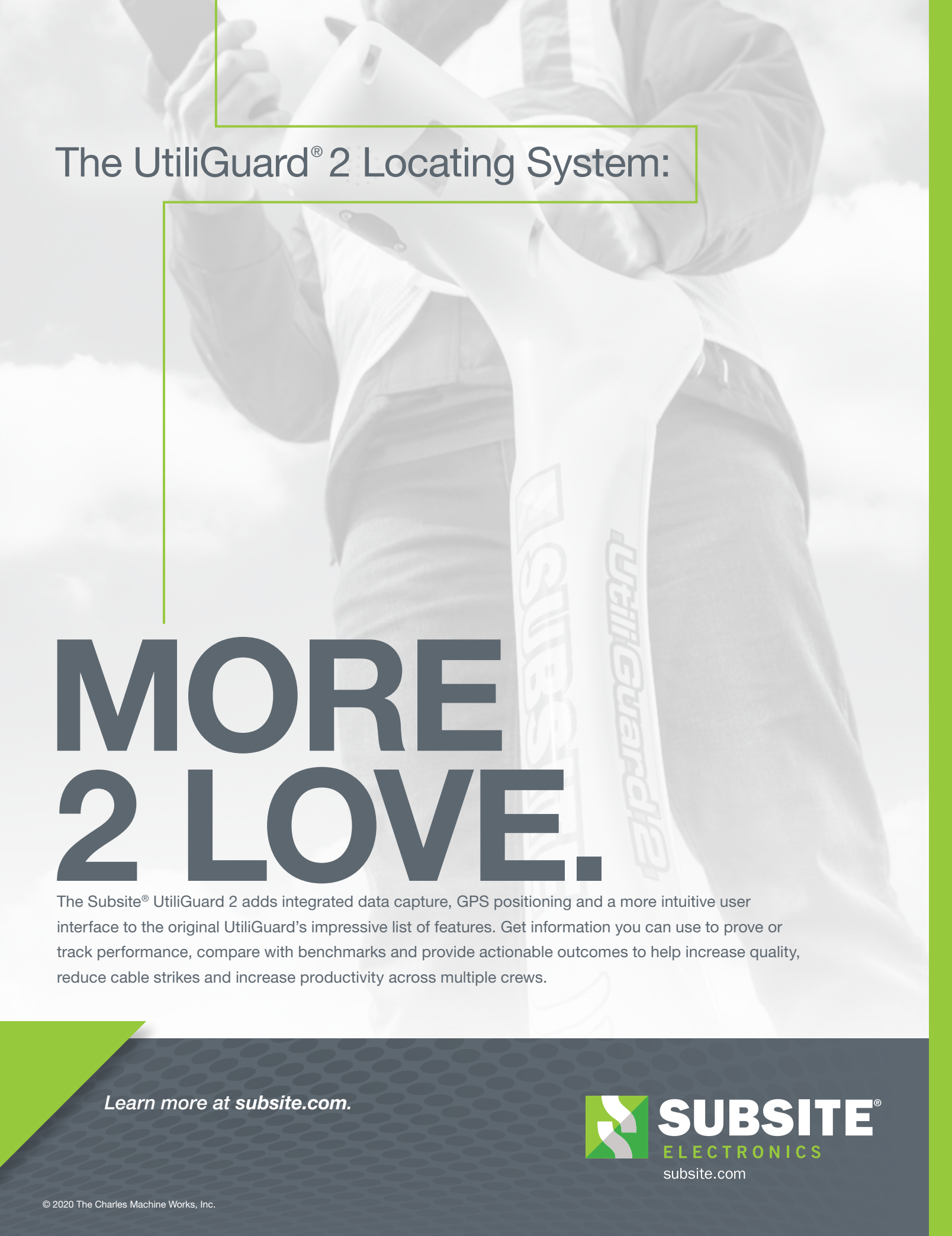
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// Celebrating LSAW

// Solving Locating Issues
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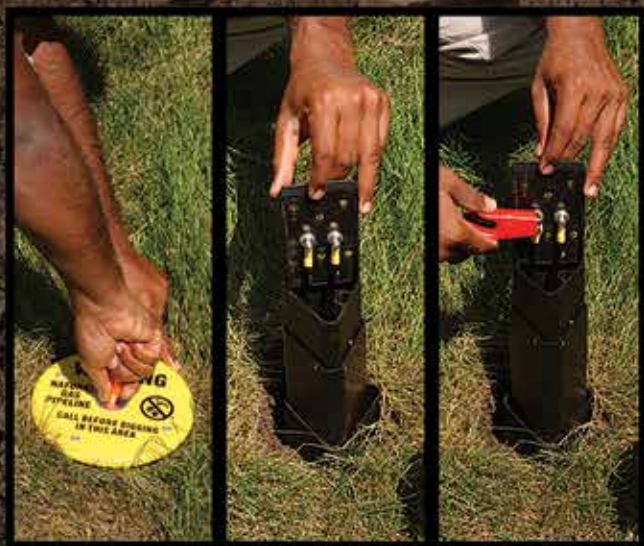
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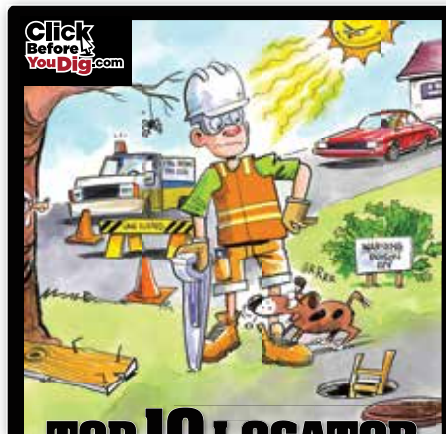
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Supporting Global Excavation Safety



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2020 SPECIAL EDITION: LOCATE

EXCLUSIVE

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FROM THE
PUBLISHER



BY SCOTT LANDES

NEW GPR Congress

The last few months have been increasingly difficult for everyone worldwide as we work together to overcome the COVID-19 pandemic. After safety concerns in California escalated to the point where we felt the safety of our attendees could be in jeopardy, Infrastructure Resources made the difficult decision to cancel our 2020 event. We most sincerely extend our appreciation to our partners in damage prevention who have extended their patience and are working with us as we find our way through this unprecedented situation.

We will continue to do what we can to mitigate the effect of this cancellation on both our attendees and our exhibitors, but feel the most appropriate course of action for us is to look forward to our 2021 event in Tampa and how we can bring additional value to that experience for you.

One of the enhancements we are building is the first ever Global GPR Congress, a joint venture between Bigman Geophysical and Infrastructure Resources.

This one and a half day event is scheduled to begin Monday, March 22 and carry through Tuesday, March 23, leading up to the opening of the Global Excavation Safety Conference (Global ESC). Participants who choose to add the Congress to their Conference registration will find four full days of education available to them as the Global ESC will have additional training topics to add to the basic Congress.

While topics related to GPR are frequently addressed at industry specific events, there has never been a place where all GPR users can go to learn from each other. Bringing users together from a variety of industries and applications gives participants a pathway for accelerated learning opportunities and provide a forum for discussion on user-critical topics. As Bigman states, "Difficulties that occurred and have been overcome in one industry can be shared and applied with technicians and professionals working in other industries. There is much crossover in reasons for failure and success across disciplines, but too often professionals working in different spaces do not have meaningful conversations with each other - or even know that each other exist."


A Global GPR event focused on bringing together new and experienced users from both the academic and private sector greatly benefits the industry by providing a forum for open discussion and continuous learning through shared ideas and experience.

We invite subject matter experts on any of these applications or issues to submit an abstract for consideration for the Global GPR Congress at <https://globalexavationsafetyconference.com/papers/>.

TOPICS:

- Pipe/Utility Detection and Cable Avoidance
- Concrete Inspection
- Bridge & Pavement Assessments
- Archaeology & Forensics
- Locating Voids
- Environmental Consulting
- Soil Contamination Mapping
- Locating USTs
- Ground Water Studies
- Geology & Mining
- Advances in Data Processing
- Large Scale Multichannel Investigations
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ISSUES:

- How many applications should GPR professionals service?
- Comparing issues between GPR work for utility detection and concrete inspection
- How much information should be given to a client?
- What are appropriate deliverables for clients after GPR work?
- When should data post-processing be conducted?
- What is acceptable terminology to use with customers?
- Should the industry move towards a shared vocabulary?
- How much training should be required for a new user/technician?
- How will application specific certifications impact the industry?
- New trends in GPR technology
- Should there be a standardized set of best practices?
- How useful are the ASTM standards for GPR work?
- What would universal GPR certification look like? 



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LOCATE

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SAFETY IN NUMBERS:

Creating Improvement
through a Focus on
Key Damage Prevention
Metrics Involving
Buried Infrastructure

BY MEL CHRISTOPHER

NEARLY 70 YEARS AGO, management theorist and author Peter Drucker coined the oft-quoted phrase, “What gets measured, gets managed.” The use of metrics plays a key role for any business that seeks to improve processes or address key priorities. It’s not just the act of measuring, however, that drives results. Selection of the correct metrics and reporting channels – and the implementation of appropriate strategies and programs – are ultimately what creates improvement.

Human health and safety measurements have been established and broadly adopted over the past two decades, resulting in remarkable improvements in worker and public safety. OSHA’s occupational safety programs are a notable high-profile example. In the past 15 years, the tracking of non-fatal occupational injury and illness incidence rates – including total recordable cases and days away from work – has positively impacted worker safety. Indeed, the U.S. Department of Labor recorded a 44% decrease in total recordable cases per 100 workers between 2003 and 2018. Over a longer timeline, OSHA’s numbers are even more impressive: worker injuries and illnesses are down from 10.9 incidents per 100 workers in 1972 to 2.8 per 100 in 2018.

Similar improvements have been realized in industries as disparate as law enforcement (body cameras and abundant video), automobiles (fuel economy and crash test results), traffic management (signage and signals), and healthcare (hospital readmissions).

Digging into Damage Prevention Metrics

Gold Shovel Standard takes those same principles and applies them to improving workforce and public safety and the integrity of buried infrastructure. While the CGA DIRT Report tracks damages and damage rates on an annual basis, Gold Shovel metrics augment those figures in several ways. First, they provide more actionable, real-time information to the operation through regular reports, data and tracking software. Second, there is a human element: the ability to have individual or group discussions and relationships with owner/operators, excavators, locators and asset holders. Greater transparency, uniformity, and industrywide comparability in all aspects of damage prevention metrics is essential to driving continuous improvement and creating safe working conditions and communities.

The Gold Shovel process is highly collaborative, drawing on key industry stakeholders to develop metrics that can reduce the frequency of line strikes as well as leveling the playing field. For example, the Excavation Metrics Committee is tasked with developing, testing and working towards the broad adoption of metrics that can be used by excavators, while the Pre-Excavation Damage Prevention Metrics Committee is tasked with establishing measurements for owner/operators and the locators that they employ.

Gold Shovel’s Damage Prevention Incident Rate (DPIR) was released in 2019 as a way for facility owners and contractors to normalize damage prevention comparisons. Early indications are that it’s making a big difference, with members such as facility owners, contractors and municipalities seeing significant reductions in damages. Peoples Gas of Chicago cited Gold Shovel Standard culture as a contributing factor in elevated performance on efforts to reduce damage to underground facilities including third-party and first-party reductions of approximately 49% and 66%, respectively, since 2016. Some larger contractors are seeing benefits beyond damage reduction in the form of improved business operations.

As Drucker knew well, measurement not only gives us a clear vision of current reality, it serves to motivate action. It’s human nature that we want to improve when we’re scored on a process. In partnership with industry stakeholders, Gold Shovel seeks to harness that instinct in ways that will pay safety dividends now and far into the future. **DP**

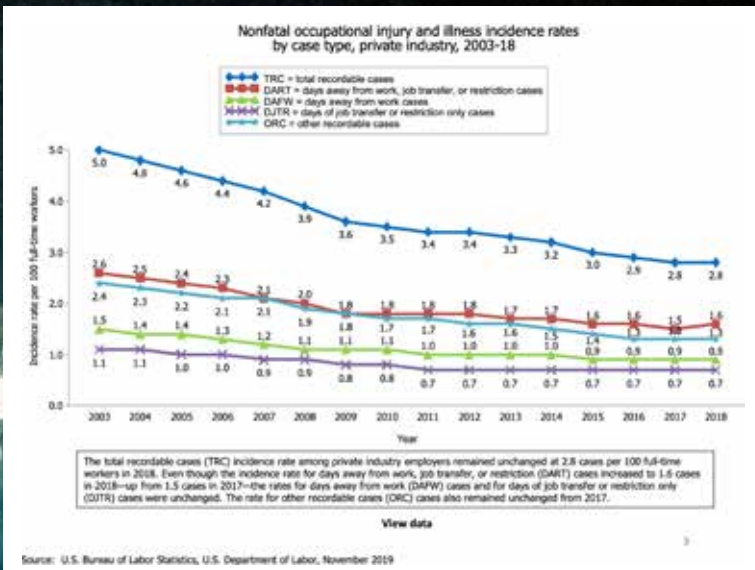


Chart 1. Incidence rates of total recordable cases, private industry, 2009-18

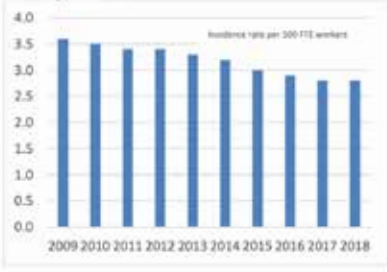
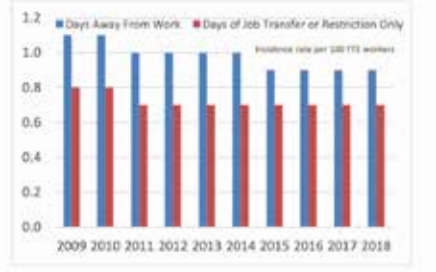


Chart 2. Incidence rates of days away from work cases and job transfer or restriction only cases, private industry, 2009-18



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A Year in the Life of a Liaison: **The Journey to Get to 811**

Part 1: The Early Years

BY BRIAN MOREHOUSE



How does someone go from 25-plus years in the utility business to becoming the Western Education Liaison for North Carolina 811? It was a journey I never expected.

When I started my career in the utility business, I was like any other young 20-year-old. I didn't know what I really wanted to be in life. Heck, all I knew was I wanted to make money and be rich! Life isn't that easy; hard work and dedication were needed. My stepfather, Carl Patterson, gave me what turned out to be some of the best advice I ever received, "work hard when you're young and make what you can of yourself early in life and I guarantee you will glide like a plane in midair throughout your older years." I followed that advice and, thankfully, it worked out pretty well for me.

In 1990, I went to Virginia Power and started as a grounds man in their construction department. Not knowing a thing about electricity, I started off as what they called a "grunt." I joined Virginia Power with hopes of being a welder in a nuclear power plant in Virginia, but the powers that be didn't see that in my future. There were days when co-workers would tell me, "I bet your parents sure are proud of you, going to college at night and digging ditches during the day." Honestly, I was just glad to have a job and be making pretty good money. At that time, many of my friends had a college education but a lot of them didn't have a career or a job of which they felt proud.

Fast forward almost 10 years - I've been in the line crew doing everything from setting poles to installing UG facilities for residential and commercial. Virginia Power was now known as Dominion Power and I got the chance to put some of my education to work with them. Several big transitions had happened and I was a lucky enough to be able to get into their design program. They trained me to design OH/UG power lines, street light designs, and 3-phase re-conducting. Coming from the construction side of the business, I had a pretty good upper hand on the competition. I had the chance to finish the Design Program early and that set my path to being an Associate Designer. Over the years, with hard work and dedication, I was promoted to Project Designer which created the opportunity to be exposed to many different roles. I had the chance to lead crews in storm restoration, design subdivision layouts, and move into a leadership role.

"Wow," I thought. "A little ol' kid who worked hard in high school and college is getting the chance to really perform!" I was pushing hard and trying to learn all aspects of the business. There is a saying I learned along the way, "Knowledge is power, and no one can take knowledge away from you."

Over the years, I got to move on and work in North Carolina with one of the largest electric co-ops on the east coast, Energy United. I didn't know much about co-ops and was used to working for an independently-owned utility. To put it mildly, it was a lot different. It was a great learning experience, but I didn't realize that in a co-op you wear many hats. There are generally no departments dedicated to subdivision work, commercial or re-conducting. At a co-op, you do it all - which allowed me to gain a lot of additional experience along the way.


As technologies improved, Energy United wanted to start reading meters through a fiber network. Guess who was the lucky one who got in on the ground floor with that project? I was put in the role of overseeing the design plan and installation of close to 60 miles of fiber,

both overhead and underground facilities. Great experience, but I didn't know a thing about fiber! It was a serious learning curve.

I learned what fiber splicers were and that "snowshoes" are specialized cable equipment. Heck, I thought snowshoes were made for cool stuff on the slopes! There was a lot to learn. We did it as a team because it was new to all of us. And what a job we did! Our team finished the project early and under budget. The largest project I had ever been involved in was complete and it was time to move on. I moved home and took a role as a Project Manager/Scheduler.

I found the role of Project Management/Scheduler was my cup of tea and it allowed me to continue learning along the way. I was drawing up contracts and overseeing the work being done. I felt right at home. Then I met a guy who thought I would be good in the chemical business, and I agreed. "I took chemistry," I thought. "This will be as easy as baking a cake!" I quickly discovered sales is one of the hardest jobs in any industry. I like talking to people, but trying to convince someone they need to buy something they might not need... that is hard work. Over time, I realized I missed the utility world more than I thought I would.

Like other candidates, I applied for a Liaison role with NC811 and put together a slide show to show those interviewing me what I knew about "Call 811 Before You Dig." I was one of the lucky ones. I was chosen to spread the word about communication, safety, and coordination in my new role as Western Region Education Liaison for NC811.

In the next issue we get to the best part of my journey to 811. I will share what I learned in my first year in this new role. 



NEWS

PHMSA and TSA Update Pipeline Security Agreement

(Transportation Today News) – The Pipeline and Hazardous Materials Safety Administration (PHMSA) recently joined the Transportation Safety Administration (TSA) in updating the 2004 Memorandum of Understanding defining pipeline safety and security responsibilities.

The revisions provide for interagency information-sharing as it relates to incidents, security threats, and the inspection of pipeline infrastructure that crosses the U.S.-Canadian border.

“This action will improve the safety and security of our nation’s energy infrastructure,” Transportation Secretary Elaine L. Chao said.

“We have committed to reviewing the Memorandum of Understanding at least once every five years to ensure that our safety efforts remain effective,” added PHMSA Administrator Skip Elliott.

HOUSTON Completes Major Pipe Bursting PROJECT

(WaterWorld) – One of the largest pre-chlorinated pipe bursting projects to date in North America was completed in Houston, Texas in February. The project replaced 50,000 feet of residential water main. All of the water main was in densely populated, mature residential neighborhoods, which is why Murphy Pipelines used static pipe bursting to minimize the impact to residents in the area.

Water service was maintained by a temporary bypass, and limited civil engineering was required for the project as the process followed the existing utility path. The process resulted in 86% less digging vs. open trench.

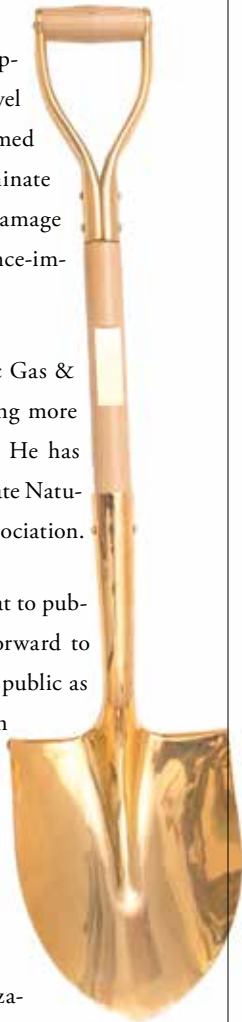
MEL CHRISTOPHER NAMED NEW EXECUTIVE DIRECTOR OF GOLD SHOVEL ASSOCIATION

The Gold Shovel Association (GSA) board of directors has appointed Mel Christopher as Executive Director of its Gold Shovel Standard program, replacing Cheryl Campbell, who was named Vice Chair of the GSA Board. The GSA program works to eliminate damages to underground infrastructure through adoption of damage prevention safety management systems and use of performance-improving metrics.

Christopher was most recently Senior Vice President at Pacific Gas & Electric, one of the largest utilities in the United States serving more than 16 million people in Northern and Central California. He has been active with the Common Ground Alliance (CGA), Interstate Natural Gas Association of America, and with the American Gas Association.

“Damage to underground infrastructure continues to be a threat to public safety and service reliability,” Christopher said. “I look forward to helping reduce this impact in order to ensure the safety of the public as well as improve service to customers. Gold Shovel has a proven track record of reducing life-threatening damages, and we will continue to engage all the damage prevention stakeholders to expand and ensure maximum effectiveness of the program.”

Campbell, who was named GSA Executive Director in early 2019, will continue to focus on additional board activities within the energy industry. She spearheaded the reorganization of the Association in 2019 and under her leadership the group saw significant growth and strong collaboration among key stakeholders in damage prevention.



WATER MAIN PROBLEMS

CONTINUE IN FORT LAUDERDALE

(CBSMiami) – Just as one water main break under the South Fork of the New River in Fort Lauderdale, Florida was fixed, an 8-inch water main was damaged in Rio Vista. This break was just several blocks from where seven sewage breaks have occurred since last December, spewing millions of gallons of raw sewage into the waterways.

District One Commissioner Heather Moraitis indicated that funds earmarked for infrastructure upgrades have often gone to balance the city budget and insisted that money collected for the water and sewer fund from utility bills stay put for system maintenance.

The city completed a major sewer project in 2011 and planned to continue, but the recession got in the way of those plans. “The second phase of that project would have been repairing and replacing all the breaks we are currently seeing,” Moraitis said. “Over the next five years, we will be replacing about 60 miles of water mains, water lines and about 118 miles of sewer lines.”

Ruptured Sewer Pipe Results in South Beach (FL) Advisory

(Miami Herald) – About 87,000 gallons of raw sewage spewed into storm drains after a subcontractor ruptured a pipe in South Beach, in late February. A second pipe burst under the increased pressure resulting in 1.4 million gallons of dirty water spilling into Biscayne Bay and some of the city’s waterways.

The breaks forced city officials to issue an advisory to avoid recreational water activities on the west coast of the island.

While Public Works Director Roy Coley said the contractor negligence caused the initial break, the old age of the second pipe played a role in the subsequent rupture. Just days before the rupture, Coley had asked city commissioners for \$122 million over the next five years to fix critical issues with the aging water and sewer system. Most of the pipes are 50-80 years old, but some components of the system date back to the incorporation of the city more than 100 years ago. The city finance committee recommended to approve Coley’s request to fund a water and sewer master plan and earmarked about \$24 million in unallocated bonds to get started on the renovation.

The subcontractor, Jaffer Well Drilling, had been hired by Hy-Power to install a dewatering well for Florida Power and Light and they apparently drilled outside a zone delineated with utility line markings.

Indiana Promotes Safe Digging Month

(Kokomo Tribune) – Indiana 811 is encouraging all state residents to know where utility lines are buried before putting a shovel in the ground this spring. April is Safe Digging Month across the country, and the state’s One Call is asking do-it-yourselfers to “Call Before You Dig.”

Residents can call 811 or use the “811Now” online service to request utilities mark their underground lines. The simple, online service was launched in 2014. Indiana 811 offers residents across the state the following recommendations:


DEALING WITH NATURAL GAS

- Always call 811 or visit Indiana811.org/811now before digging, regardless of the depth.
- Tell neighbors, co-workers, family and friends about 811 if they discuss their plans for an outdoor tree or shrub removal project with you.
- Plan ahead – make sure you call or fill out the online form at least two working days in advance of your project.
- Avoid starting projects until you are sure all lines have been marked.
- If your excavation is within two feet of the marked facility, you must only use hand tools.
- If a contractor has been hired, confirm the 811Now online form has been completed or a call to 811 has been made.

BILL TO ADD LIQUEFIED PROPANE TO MAINE’S DIG SAFE LAW GETS INITIAL APPROVAL

It was reported in the last issue of *dp-PRO* that a bill was introduced in Maine to add liquefied propane gas in the state’s Dig Safe law after a deadly explosion in Farmington last year. The bill, introduced by Rep. Seth Berry and co-sponsored by Rep. Scott Landry and Sen. Russell Black, received its first rounds of “yes” votes recently, passing unanimously in both the House and Senate.

The bill was advanced by the Energy, Utilities and Technology Committee in early February prior to going to the House and Senate for vote. It is now expected to go to Governor Janet Mills for final sign-off.

The Farmington explosion was ignited days after an underground propane line was severed during the installation of one of four bollards drilled into the ground near the building. The propane leaked from the severed line and led to the explosion. 



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AND THE SURVEY SAYS...

BY LOUIS PANZER

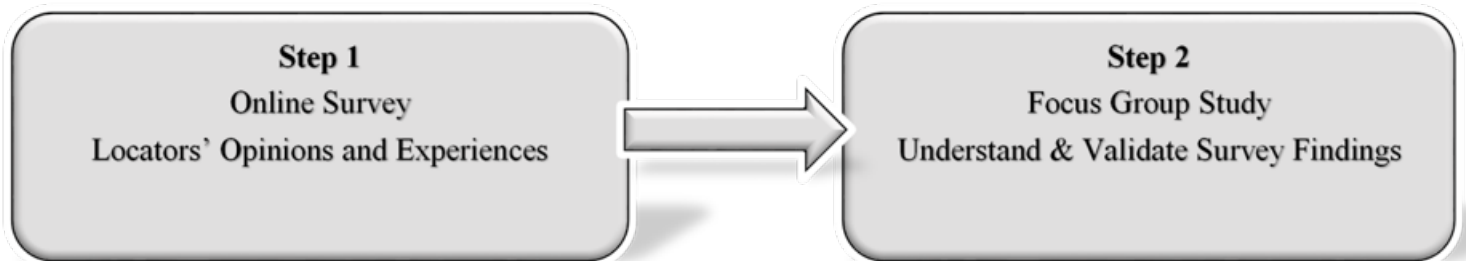
Using Research to Improve Damage Prevention in North Carolina

The damage prevention industry has always understood that data collection is critical. Data measures our progress and our challenges; data paves the way forward and sometimes serves to change the fundamental way the industry operates. North Carolina 811 recognized the importance of data gathering and analysis in 2013 and began in earnest by consolidating data from One Call tickets, damage reports, and marketing efforts into what became known as the “Supermega Spreadsheet.”

In 2017, Dr. Ahmed Al-Bayati was engaged to take a more academic approach to the data analysis. During that time, it was identified that cross-validation of the raw data could be performed with surveys.

The initial results of the research confirmed, in North Carolina at least, that a significant

ing on-time locates. As we explore root causes in North Carolina we look into issues like update tickets. The law requires excavators to update their requests when the work is to exceed the 15 working day life of the ticket. Looking specifically at tickets where the work duration was indicated to be “1 day or less”, we discovered thousands of tickets per month that had been updated more than twice. These “low hanging fruit” opportunities opened the conversation with contractors and the



challenge to the One Call process was on-time locates. Data from positive response was confirmed through surveys conducted with professional and “first time” excavators.


Based on the results, Dr. Al-Bayati and I wanted to know more about the challenges experienced by professional locators. There are few problems that are black and white. Understanding the issues that impact locators helps to arrive at solutions for the overall process.

In 2019, surveys were sent to locators throughout the U.S. and 98 were returned completed. The individuals responding ranged from contract locators (66%) to those working directly for a municipality or operator. The range of experience was from a few years of field experience to Supervisors and Managers. The questions were designed to allow locators to rank challenges in order of priority. There was also allowance for free-form responses.

As a follow up to the answers we received, two focus groups were formed. Again, a mix of locator type and experience was included. The issues faced include the quality of maps shared with the locators, broken tracer wires, tickets for which work wasn’t taking place, false emergency requests, lack of access in some cases, use of excavation tickets for design requests, lack of white lining and incorrect information on locate requests.

While these are not offered as excuses, it points out the complicated issues surround-

ing on-time locates. As we explore root causes in North Carolina we look into issues like update tickets. The law requires excavators to update their requests when the work is to exceed the 15 working day life of the ticket. Looking specifically at tickets where the work duration was indicated to be “1 day or less”, we discovered thousands of tickets per month that had been updated more than twice. These “low hanging fruit” opportunities opened the conversation with contractors and the

companies hiring them to discover what could be done in these cases to better manage the process. Using data to direct actions is the best method to break the bad habits and change the behaviors of all those involved in the process. It often only takes a single disruption to set off a chain reaction in delays that can cascade down, add to delays, increase risk and jeopardize the entire safe digging process wheel. Safe excavation is absolutely a shared responsibility. We hope that leveraging data can not only identify “stress points” and “system noise” but also draw attention to the controllable actions impacting performance in the field. 

Research may be found at nc811.org.



Working in confined spaces may pose inherent dangers. OSHA regulations help ensure employers take effective steps to mitigate or eliminate these dangers.

OSHA revised its confined space regulations for general industry (Standard 1910.146) in 1994, but some believe the standard didn't fit well for construction projects. In 2015, OSHA introduced more stringent regulations designed specifically for the construction industry: the Confined Spaces in Construction standard (1926SubpartAA).

Although the new standard resembles the old one in some ways, there are several key differences. There has been some misunderstanding around the newer standard and when it applies. So... which one is for you? Let's review two common points of confusion.

General Industry or Construction Industry?

The original standard was intended for general industry, which meant all industries that are not agriculture, construction or maritime. The new construction standard applies to those employers performing construction work – industrial, commercial or residential.

gates, OSHA would consider that construction. The new valve is similar in function but improved in technology.

There's another caveat. If a maintenance project requires contractors to perform complex, large-scale work, OSHA considers it construction. If any of that work is done in a confined space, Standard 1926 AA would apply.

By way of example, in a project in Louisiana, when a contractor discovered that some of the beams in the structure lacked the required fire-proofing coating, the contractor opened up parts of the wall, removed the bad beams and replaced them with appropriate beams. Although they were pulling one thing out and replacing it with

Two Confined Space Standards: WHICH ONE IS FOR YOU?

BY BRUCE MAGEE



Some employers in heavy industrial settings may think that because their work is industrial in nature, they should conform to the general industry standards. That is incorrect. "Industry" does not mean "industrial." OSHA intended for general industry standards to be applicable at any place of commerce, worksite or business.


Construction or Maintenance?

What are the differences between construction and maintenance activities, and why is this important? Contractors doing construction work in confined spaces are required to follow 1926 AA. Those performing maintenance tasks may follow 1910.146. The key is determining which standard is appropriate for a given job. How is an employer to make the distinction?

In a letter clarifying the difference between maintenance and construction activities, OSHA defined construction work as "construction, alteration and/or repair, including painting and decorating." It defined maintenance as "keeping equipment working in its existing state, i.e., preventing its failure or decline."

The distinction can be explained with this analogy: Suppose you're working in a confined space and pull out of that space a leaking valve. If you replace that bad valve with a new but identical valve, that would be considered as maintenance. However, if the replacement valve is made of more durable material, with improved stems and

a like item, OSHA would consider it construction because of the complexity or the degree of difficulty of the task.

To help clear up confusion about the Confined Space in Construction standard and when it applies, OSHA has created an FAQ page. Neither this article nor the OSHA FAQ page is a substitute for seeking expert advice on OSHA standards. Consulting experts regarding confined spaces, trench safety and the applicable regulations regarding the specific circumstances of the job to be performed is always the best practice. 

Bruce Magee is a trench safety expert at United Rentals. With 39 years in the rental industry, the last 25 in Trench Safety, Bruce has delivered 380-plus Competent Person classes. He has presented on Trench Safety/Confined Space Safety requirements across North America.



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Q How has our Underground Mapping Documentation Practices Improved over Time?

BY
Michael A. Twohig

TODAY'S MODERN utility locating technology and procedures have come a long way from the primitive tools our forefathers used in tunneling beneath the ground. Yet, in many ways, our current documentation practices have regressed. Lessons learned from pioneers in underground mapping can still be applied in today's high-tech environment to continue a legacy of record keeping that is critical to safe and successful development.

In the 1890s, Boston engineers, prompted by an urban population boom, set out to build the first United States subway system through the city's narrow colonial-era streets. As they broke ground on the new transit system, the designers discovered that not only were the streets above ground congested with pedestrians, carriages, and trolleys, but the underground was congested with a web of buried facilities. The engineers tried to work with utility owners to compile plans for the utilities but were left empty-handed. The culprit: inadequate documentation.

Insights from the Boston Transit Commission 1895 report state, "The records of most of the underground pipes, sewers, and other structures laid years ago were imperfectly kept; in fact many such structures were built without any records of their location being made." In the years following, the Boston designers brought in a subsurface mapping team to locate and meticulously map the existing underground utilities to avoid ever being without a map again. The plans and cross-sections discovered during these subsurface investigations helped planners, engineers, and cost estimators design early utility relocation contracts and expedite the Boston subway work, which was reported in 1897 as on schedule and on budget - an anomaly in today's development environment.

Since the comprehensive mapping efforts of the nineteenth century, our industry has encountered technological revolutions that have transformed the way we map utilities. The latest advancements in remote sensing technologies, such as GPS and terrestrial LiDAR systems, allow us to efficiently map aboveground and belowground with immense accuracy, giving stakeholders a thorough understanding of site conditions before breaking ground.

While the industry has advanced in data acquisition and processing, our data preservation practices have deteriorated. Ironically, when it comes to underground mapping, our new high-tech methods are often applied to work that has already been done by predecessors like the Boston designers. Despite the painstaking mapping efforts of our forefathers, the records of the past have been lost as we have become poor custodians of data.

The consequences of poor documentation go beyond just repeating work; they can lead to project delays, financial constraints, dangerous working conditions, and potential lives at risk. After the Columbia Gas explosion in Merrimack Valley that led to major disruptions, destroyed property, and even a death, the National Transportation Safety Board investigated and the report cited the probable cause of the incident as "weak engineering management," including a lack of documentation and recordkeeping of underground assets.

Today, the question becomes, how do we locate, store, and retrieve critical infrastructure records? In many subsurface utility mapping programs, designers and planners have expanded locating methods beyond state One Call mark outs to include documentation of accurate subsurface information to integrate project teams. In conjunction, cloud-based solutions are growing in popularity to store and share vital records and documents, therefore, improving safety, access to data, and the security of knowing our information below is safe above. As new technologies emerge, we must harness them not only



for doing the work, but also documenting the work. The recordkeeping principles from 125 years ago still stand true and continued innovation will allow us to be better custodians for our future generations. **DP**

Michael A. Twohig, is the SUE/SUM Services Director of DGT Associates. He is an international subsurface mapping expert with more than 35 years of experience in professional utility locating, mapping, damage prevention, and industry safety awareness.



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- Bruce Campbell, MISS DIG System Inc. - 8 time attendee

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Kim Kosky

A Passionate Supporter of Employee, Excavator and Public Safety

• STAFF REPORT •

KIM KOSKY, DIRECTOR OF TRAINING AND PROCESS IMPROVEMENT, JOINED UTILIQUEST 19 YEARS AGO AND THINGS HAVEN'T BEEN THE SAME SINCE. KIM WAS NOMINATED BY HER PEER, JEFF HALL, WHO SAID, "KIM'S CONSTANT DRIVE FOR PERFECTION HAS IMPACTED THOUSANDS OF DAMAGE PREVENTION TECHNICIANS OVER THE YEARS.

Kim's passion about proper training for employees that protect our nation's infrastructure, paired with her belief that training and development are the keys to improved damage prevention and execution, ensure all levels are educated and have the tools to be successful. It is one of the reasons why Kim is a DP Hero." Her deservedness is emphasized by Terry Fordham, President of UtiliQuest/Locating Inc. as he acknowledges, "Kim is a hero in many ways within our company."

To say Kim is focused on safety is an understatement. Kim was described as "hyper-focused on safety" by Scott Landes, President and CEO of Infrastructure Resources and Rhino Marking & Protection Systems. He continued to say, "Kim is always concerned with safety, and not just the safety of UtiliQuest locators, but all locators and excavators." Kim is an advocate for real damage prevention as well as an advocate for the workforce striving to keep our nation's infrastructure safe each day.



“ Kim is always concerned with safety, and not just the safety of UtiliQuest locators, but all locators and excavators.”

A quiet leader, Kim has driven changes for personal safety while recognizing the critical need for quality performance is what will prevent damages. Kim has impacted the development of hundreds of employees in the southeastern United States. According to Jeff Hall, Kim will personally work with new employees and trainers to develop the skills and expertise needed to be a Damage Prevention Specialist.

Kim's accomplishments both within and outside of her company are many:

- Contributed to the development of a training

program for the Damage Investigators in the southeastern United States

- Developed a 'Train the Trainer' Program featuring Adult Learning Modalities
- Member of the CGA Education Committee
- Pioneered the Field Check Department internally
- Previous Co-Chair of the CGA Education Committee
- Trained employees to review technicians' completed work remotely and preventing damages through proactive intervention prior to excavation
- Volunteered her time with Georgia 811 and the Locate Rodeo

When she's not working, Kim is an avid hiker and nature advocate participating in river cleanup operations in her area. A fan of geocaching, Kim works with local groups to clean up trails and keep our countryside beautiful for the next generation.

Kim is a passionate supporter for employee, excavator, and public safety. A true Damage Prevention Hero! 



ASSP Foundation Family Scholarship

• BLAINE KRAGE •

MANY SAFETY professionals know that the Utilities Practice Specialty within the American Society of Safety Professionals (ASSP) provides access to a network of safety and utilities experts as well as industry education and information. It's a resource for members looking for technical knowledge in the utility industry on issues related to electrical, solar, natural gas, wastewater, telecommunications and many other areas.

But what is less known is how ASSP is assisting the educational path of family members impacted by workplace tragedies. Utility workers face a wide range of safety hazards that can result in fatal injuries. Having a loved one die on the job takes an emotional toll and often creates a significant financial hardship for the worker's spouse and children. That is what prompted the ASSP Foundation to create its Family Scholarship in 2013.

"A devastating workplace incident involving a family member can derail a person's plans to attend college or pursue more education," said ASSP Foundation Chair Linda Tapp, CSP. "We are committed to helping families that have experienced these difficult circumstances."

The 2019 Family Scholarship recipient, Kaley Renslow, had her life turned upside down at age 12 when her father was killed in a plane crash. "Without my dad, I lost so much of my identity at an early stage in my life," she said. "Because my mom had just lost the love of her life, I took on the roles of friend, confidant, companion and daughter, and showed her unconditional love and support, just like my dad would have done."

"Through the grief process, I've come to realize just how much I care for people," Renslow said. "I encourage others to be the best versions of themselves. This scholarship not only bridges the gap financially, but also lifts such a heavy burden from the lives of those affected by the loss of a loved one."

The 2018 Family Scholarship recipient, Samantha Wooten, has worked tirelessly to bridge gaps for others. Her father was killed at his public sector job in 2016. The fatal incident wasn't investigated by the Occupational Safety and Health Administration (OSHA) and did not lead to remedial action or a safety citation.

That outcome moved Wooten to action. She successfully advocated for legislation to improve workplace safety for public employees in New Hampshire. In May 2019, a bill was signed into state law to expand how serious workplace injuries and fatalities are reported and investigated. In



ASSP Foundation Chair Linda Tapp (left) and 2018 Family Scholarship recipient Samantha Wooten


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recognition of her efforts, Wooten received the Family Activist Award from the National Council for Occupational Safety and Health (National COSH).

"I try day-in and day-out to give my father a voice and help ensure this type of incident doesn't happen to another person," she said.

Wooten is in her first year in the occupational safety and health graduate program at Keene State College in New Hampshire. She serves on the executive boards of United Support and Memorial for Workplace Fatalities and the New Hampshire COSH. 

Learn more about the ASSP Foundation Family Scholarship at www.assp.org/family. The ASSP Foundation, celebrating its 30th year as the charitable arm of ASSP, works to build a strong pipeline of occupational safety and health professionals to make all industries safer worldwide.

Late Locate Symposium

• IAN SIMPSON •

IN DECEMBER 2019, twenty-five industry leaders participated in a Late Locate Symposium to improve the timely delivery of locates within Ontario. The goal of the three-day intensive event was to develop solutions that would make a positive impact on the 2020 dig season.

The group consisted of Excavators, Utilities, Municipalities, Locate Service Providers (LSPs), and representatives from Ontario One Call. Participants were selected based on their ability to make substantial decisions within their own organization, and their ability to influence others in the industry.

Led by an independent facilitator, the group delved into the systematic issues affecting locate delivery. Each participant actively engaged in building the plans, and viewpoints from all stakeholder groups were woven into the design of each solution.

Five implementable solutions were developed and Ontario stakeholders can expect to see these strategies in 2020.

Dedicated Locator

Moving major infrastructure projects to a dedicated locator model relieves stress and frees up the regular pool of locator resources. The program has utilities responsible for the dedicated locator model on their own capital projects. This dedicated locator model allows capital projects to stay on time. Resources are independent of the regular pool of locator staff. In 2020, certain infrastructure types will be put into this model with more to follow in the coming years.

Forecasting

Being able to accurately forecast the amount of staff required in a specific region/area to deliver timely locates has been an ongoing issue affecting delivery. To help solve this, a new forecasting model is being developed to give visibility to the resource demand required. Utilities, municipalities, and LSPs forecast workloads by collecting and distributing ongoing details related to capital projects and major capital work. LSPs show calculations outlining resource requirements to utilities and municipalities based on the data. Ongoing check-ins assess the success of the forecasting. A pilot program will start in Ottawa.

Pressure Points

Multiple pressure points affect not only the timely delivery of locates, but also the ability of an excavator to complete a dig after receiving a locate. Managing locates is one of the biggest issues.

This solution focuses on utilities and municipalities changing their locate validity period to 60 days and standardizing the expiration date to land



on the same date. This helps reduce re-locates entering the system and helps excavators reduce the strain of managing multiple expiration dates.

This solution will also develop proper guidelines on how to share locates with subcontractors.




Compliance and Enforcement

To overcome confusion in the industry, this solution ensures greater communication about the rules, compliance process, and the roles and responsibilities of each stakeholder. Ontario One Call will look to implement a change in billing to a performance-based model that rewards utilities and municipalities for good locate delivery performance and penalizes poor performance. Performance-based billing ensures utilities and municipalities with late locate delivery incur a higher share of membership billing costs.

Data in, Data Out

There is a disconnect between the information provided on a locate request and what is needed by LSPs to perform an efficient locate delivery service. To reduce over-notification and eliminate other factors affecting LSP productivity, a group will be set up to define the criteria necessary. Data will be used to create a checklist to be implemented through pilot areas.

The finalized process will be incorporated into the curriculum of the Professional Locate Administrator Course (PLAC) launched through Ontario One Call in 2020. Designed for locate administrators, PLAC simplifies the request process, increases consistent high-quality tickets, and helps with the timely delivery of locates. 


To learn more about these topics please contact training@OntarioOneCall.ca.

The Value of Nulca

BY RON PETERSON



“NULCA PROMOTES THE WELL-BEING OF PROFESSIONAL LOCATORS FROM THE INDIVIDUAL TECHNICIAN TO THE LARGEST COMPANY. OUR MEMBERS INCLUDE CONTRACT LOCATORS, IN-HOUSE LOCATORS, PIPELINE COMPANIES, PRIVATE LOCATORS, SUE CONTRACTORS, VACUUM EXCAVATORS, REGULATORS, ONE CALL SYSTEMS, MANUFACTURERS AND SUPPLIERS, AND MANY OTHERS.”

tional Safe Digging Month (April 20-26, 2020). LSAW was developed by Infrastructure Resources to honor and recognize the critical work performed by utility locating professionals. It is the perfect opportunity to promote awareness of the hazards utility locators face daily and to express gratitude to locators for the role they play in protecting our underground infrastructure. 

Learn more about Nulca at nulca.org or LSAW at locatorsafety.com.

Nulca, the organization for utility locating professionals, recognizes the critical role the locating function plays in the underground damage prevention process, and that locators are essentially a limited resource. For the past 25 years, Nulca has held steady to their mission – advance locating throughout North America. Nulca’s primary benefits center around education, industry partnerships, and strengthening the reputation of locators within the industry.

In 1996, Nulca published its first Competency Standard for training utility locators. This guideline has since become the industry standard and is now in its fifth revision. It serves as the basis for the Nulca Accreditation/Certification program, rolled out in March 2016 through a partnership with NSF, the industry leader in safety-based risk management solutions and verification.

Education

Without education, advancement comes slowly, if at all. In 2020, Nulca expanded its benefits for member organizations by adding a free webinar series. The first of a 10-part webinar series began in February with a session highlighting “Multi-Channel GPR” presented by IDS and conducted by Ron Peterson, Executive Director of Nulca, and Laura Vernon, Customer Support Manager with IDS GeoRadar. The webinar covered the benefits of multi-channel ground penetrating radar systems. Beginning with a brief introduction on GPR, it continued with a comparison between single-channel GPR systems and multi-channel systems. The webinar continued to break down the differences and highlight how to get the best results of each type of GPR systems. The webinar finished with a discussion of dual polarized systems.

Some upcoming webinar topics include concrete GPR, data logging, EM locating and paint innovations. Webinars are held at least once per month for members.

A further benefit is the ability for members to utilize Nulca’s platform for their own webinars at no cost. Vendors and sponsors of Nulca can also set up webinars at no cost for Nulca membership.

Industry Partnerships

Nulca works closely with numerous industry associations and organizations to prevent utility damages as well as to promote safety and enhanced communication. Nulca promotes the well-being of professional locators from the individual technician to the largest company. Our members include contract locators, in-house locators, pipeline companies, private locators, SUE contractors, vacuum excavators, regulators, One Call systems, manufacturers and suppliers, and many others.

Nulca is an endorsing partner of Locator Safety Awareness & Appreciation Week (LSAW), held annually during the final week of Na-

NEWS

MISSISSIPPI Emergency Management Agency Provides Flood Plan

(The Clarion-Ledger) – The Mississippi Emergency Management Agency has provided state residents with suggestions on how to handle a flood emergency, including an evacuation plan, who to contact, taking appropriate steps before a flood occurs, and how to deal with natural gas.



DEALING WITH NATURAL GAS

- During a natural disaster or severe weather event, do NOT turn off natural gas, even if evacuations are issued.
- If you smell gas, immediately leave the affected area and from a safe distance, call 911.
- Do not use a mobile phone or anything that might cause a spark, such as a generator.
- If flooding occurs at a residence or business and the gas appliances are under water, do NOT try to operate the appliances.
- If a natural gas meter is damaged or a gas line is exposed, immediately leave the area and call your utility provider.
- Know where your natural gas meter is located, and make sure it is visible and free of trash/debris.
- Natural gas distribution pipelines are mostly underground but can be damaged by uprooted trees and shifted foundations. After a storm, call 811 to have the location of underground utilities marked before cleanup begins.

FATAL TRENCH COLLAPSE IN MISSISSIPPI

(Sun News) – OSHA has cited Rhobina Electric, Inc., a commercial electrical and plumbing contractor based in Batesville, Mississippi, for exposing employees to excavation hazards after a worker suffered fatal injuries in a trench collapse at a Taylor, Mississippi worksite. The contractor faces \$37,318 in penalties.

The employer was installing a sewer pipe to a new concrete manhole when the collapse occurred. OSHA cited the company for allowing the employees to work in a trench without hard hats or cave-in protection, and for not removing workers from a trench that showed signs of water intrusion and possible collapse. OSHA also cited the contractor for failing to meet reporting requirements, which mandates that employers notify OSHA within eight hours of any incident involving an employee fatality.



OSHA recently updated the National Emphasis Program on preventing injuries related to trenching and excavation collapses. Also, OSHA's trenching and excavation website provides additional information on trenching hazards and solutions, including a trenching operations QuickCard and a "Protect Workers in Trenches" poster.



Pipeline Avoidance Guidelines Published

The Council for Dredging and Marine Construction Safety (CDMCS) recently released its Pipeline Incident Prevention guidelines for dredging near underwater gas and hazardous liquid pipelines. The guidelines incorporate damage prevention and emergency response protocols for the US Army Corps of Engineers navigation channels.

“Fifteen months ago we all agreed that the dredging and pipeline industries lacked mutual best practices for preventing pipeline incidents, and we all agreed to do something about it,” said Michael Gerhardt, managing director of the CDMCS and Pipeline Task Force. “We are now delivering an extremely valuable safety resource to the public and have designed it for active use in the field. Any contractor that dredges or performs marine construction operations in the vicinity of underwater pipelines should consult this best practices guide and share it deep within its company at all levels of management.”

The document contains guidance on accurately locating pipelines and obtaining accurate coordinates, identifying leaks and responding effectively, and collaborating with all necessary parties in the event of a leak.

DAVID FINK NAMED PRESIDENT OF PLASTICS PIPE INSTITUTE

(WaterWorld) – The Plastics Pipe Institute, Inc. (PPI) named David M. Fink as its new President and Executive Director in January. Fink, a veteran of the plastics pipe industry, previously served as Chairman of the PPI Board of Directors from 2017 to 2019. He served as Senior Vice President at PPI member company, WL Plastics, and had also worked at Dow Chemical in the company’s polyolefin resin business. While at WL Plastics, Fink oversaw the company’s sales in the polyethylene pipe market segments, including gas gathering and distribution, municipal water distribution, industrial and mining applications, telecommunication conduit, and geothermal.

Fink has participated in a number of related standard-setting organizations and related associations, including the Alliance for PE Pipe, ASTM International, American Petroleum Institute, American Gas Association, American Society of Mechanical Engineers, American Water Works Association, and the Canadian Standards Association.

Steel Water Pipe Product Award Winners Announced

(WaterWorld) – The 2019 Steel Water Pipe Product Award winners were announced in January during the annual Steel Water Pipe Section meeting in California. Steel water pipe and pipelines are used in potable water systems throughout the country and the world. The award for Best Steel Water Pipe Fabrication went to Jifco, Inc., Livermore, California for their project on the Los Angeles Reservoir UV Disinfection Facility. The award for Best Steel Water Pipeline Project went to Mid America Pipe Fabricating and Supply LLC, Scammon, Kansas for their Elm Work WTP project in Carrollton, Texas. The awards are based on four criteria:

- Promotional value – Promotes the value of steel fabrication
- Uniqueness of product/project – shows originality and versatility
- Design and engineering – excels in technical aspects
- Aesthetics – visual appeal

Suit Filed in 2018 Baltimore Trench Collapse

(Baltimore Sun) – The family of a construction worker killed in a 2018 trench collapse at an excavation site has filed a wrongful death lawsuit against the city and its subcontractor for alleged negligence. The man was working on a sewer line near the Clifton Park Pool when a 15-foot trench caved in.

The contractor, R.F. Warder, was hired by the city to perform repair and maintenance service on city plumbing and heating systems. R.F. Warder was fined by the state for its role in the incident, but the company is appealing the decision.

A Maryland Occupational Safety and Health investigation concluded that R.F. Warder failed to train its crews to recognize and avoid unsafe conditions and did not conduct adequate daily inspections of the site. The agency recommended a \$275,000 fine, but after the company contested the fine, it was reduced to \$245,000.

Among other things, the family lawsuit claims the hole was about 15 feet deep and lacked proper shoring, such as protective walls and sloped ways out, which are required for trenches more than five feet deep by OSHA. **DP**

The Buried Truth about Human Factors

BY JOE TANTARELLI



In June of 1983 my life changed forever. I was 26 at the time. Like many 26-year-olds, my Sundays usually bled into my Mondays and going to bed at 2:30 in the morning only to leave for work at 5:30 a.m. was perfectly normal. The morning of my accident, I got an extra 20-minute nap in the passenger seat of the tractor-trailer rig that was hauling our excavator to the job site.

When I started in this work my first safety orientation was straight to the point, “We hustle here. All day. Every day. If you’re not a hustler, then go home now because there’s no way we can waste time on you.”

SAFETY TRAINING:

- 1.** Hurry up and get the pipe buried in the trench before it buries you.
- 2.** The longer the trench is open, the more chance it’s going to cave in.
- 3.** If the trench caves in but doesn’t kill you, just hang tight because there’s going to be a second cave-in. And that second collapse is going to be more catastrophic than the first. It will take you out.

Over the next seven years, I learned a lot. As the operator-foreman, I was responsible for training

people. On the day of my accident, I was working with two inexperienced 17-year-old laborers whose priorities did not include learning the trade. In order to save money, the customer we were working for that day decided to have his plumber supply the 4-inch pipe we needed for the job. My boss approved it on condition the pipe was delivered to the job site before we arrived; but when we got there that morning, the pipe hadn’t arrived yet. I was livid. I sped over to the site office trailer to tell the foreman we were leaving for another job that was actually ready for us, because they obviously weren’t. After calming me down, the foreman assured me the pipe was on its way and would be ready when I needed it.

When the pipe finally arrived, my patience was already low. I didn’t have time for on-the-job training and my laborers were taking forever to make a decision on something. When I asked, they said they wanted to put a bend on the pipe. I knew from experience they didn’t need a bend, but I was in a hurry and didn’t want to argue with them. I gave them the only 4-inch schedule 40 bend I had and some PVC glue. They fumbled around trying to get it to affix to the fitting. I knew if the glue set, they would end up losing it

and I had no room for error so I yelled for them to get out of the way. I jumped into the trench and slammed the pipe into the fitting.

Just as I was about to start scolding them on how easy it was, I noticed movement out of the corner of my eye. 25-30 feet of trench wall was moving, and a collapse was imminent. I knew I needed to get to the very end of the trench because its configuration caused an arch effect which provided a safe zone in the event of trench failure. As I was turning to run, I realized both laborers were still in the trench with me and had no idea what was about to happen. The collapse of a 6’ X 4’ X 8’ trench can send ten tons of soil crashing down on a person. Knowing all three of us were in harm’s way, I shoved both boys to safety against one end of the trench. I knew I would not make it safely to the same area, so I turned to run to another safe spot. I had done this so many times before without negative repercussions but this time I didn’t make it. I was caught at the edge of the trench collapse and was buried up to my armpits.

As the boys came running to help me, that original ten-minute safety training came back to me, “If the trench caves in but doesn’t kill you, just hang

tight because there's going to be a second cave-in. And that second collapse is going to be more catastrophic than the first. It will take you out."

I struggled in and out of consciousness, knowing if I didn't stay awake, I would die because those boys did not know how to help me. With every inhale the dirt got tighter around my chest and our only shovel was buried in the trench. One of the laborers grabbed my wrists to pull me out but I knew with the weight of a car on top of me, that would rip me apart. I yelled for him to stop and explained they needed to carefully dig me out with their hands instead.

As soon as I could move my legs, I scrambled to get out. Back in 1983, cell phones didn't exist so my ambulance was a 1978 Chevy pickup. I was pretty sure I had a broken rib or two but figured I would be home for dinner.

At the hospital, I managed to take two or three steps towards the emergency room... and the next thing I knew I woke up hearing a nurse say, "He's 60 over 40." I knew blood pressure wasn't

supposed to be 60/40, so my initial diagnosis must have been a bit off and I probably wasn't going home for dinner after all.

By the time the attending physician arrived, I had flatlined. My self-diagnosed broken rib was internal bleeding that required surgery and my left kidney had to be removed. I had three bulging discs near my sciatic nerve. Over the next 48 hours, I only remember the last excruciatingly painful 30 minutes of every four-hour interval because that was when the morphine wore off.

The emotional consequences, however, were worse than the physical. You could set a clock by my screams from recurring nightmares, but that was nothing compared to the emotional damage to my family. Every time I left for work, they feared I was never coming back. If I was 10 minutes late, they were in hysterics.

I was considered one of the safest operators in town. I was competent in my job. I had trained a lot of workers in safety. As the operator-foreman, my job was to stand up top and watch for signs

of a trench failure. I knew the risks. So why did this happen to me? Human factors training made it click for me.

State of mind can greatly impact critical decision-making. I knew the hazards but wasn't in tune with how complacency and state of mind can impact safety. I had a happy ending, but if I'd known how to prevent the errors caused by my mental state, this incident could have been avoided in the first place.

You may never get caught in a trench collapse, but the tasks of your job and the risks you face can still cause serious physical injuries and leave lasting emotional scars on you and your loved ones. My accident could have been prevented - and so can your future accident. Learn more about human factors training; it could save your life. **DP**

Joe Tantarelli is a Senior Safety Consultant with SafeStart® and a popular speaker at the Global Excavation Safety Conference and many other industry events.



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- Innes Fisher, Utility Location Services Ltd

"The technology of the future is here now. There is technology available to the asset owners, to the locators and to the construction industry, so it's really how do we work most effectively together to utilize the benefit of that technology, to achieve the aims that we all want, which is asset protection and worker safety."

- Suzanne Jones, Dial Before You Dig Australia

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Lack of Adequate Enforcement Undermines Damage Prevention

BY EBEN M. WYMAN

Excavation contractors work tirelessly to perform exemplary work while providing a safe and effective work environment. Damage prevention is, and always has been, a big part of that. While the goal of increased safety is fundamental, contractors continue to face enduring challenges related to the underground facility locating process. While it is encouraging that local media is finally beginning to cover the increasing problem of missed or late responses to locate requests, lack of adequate state enforcement of the law is exacerbating an already dire situation.

The fundamental responsibilities of damage prevention are generally agreed to. All facility operators need to participate in the One Call

According to the Michigan Public Service Commission (MPSC), who demanded an explanation, the utility "failed to respond to over 20,000 dig notice requests, and only partially responded to many others."

process. Underground facilities must be marked accurately and on time in accordance with state law. Excavators need to call 811 before they dig and follow critical practices such as potholing. When any stakeholder in this process fails to meet these responsibilities, damage prevention and public safety are compromised.

LOCATING PROBLEMS ON THE RISE

Recent years have seen significant increases in facility hits attributed to the root cause of locating issues. According to the latest CGA DIRT Report, damages resulting from locating issues rose from 14.56% in 2017 to 20.79% in 2018.

Consider these high-profile cases that gained media attention:

MICHIGAN

A large gas utility was cited for late responses to some 20,000 locate requests over a short period in 2019. Following a two-month state investigation, the utility was found to have failed to respond or respond on time to an extraordinary number of locate requests made to MISS DIG in April and May of last year.

According to the Michigan Public Service Commission (MPSC), who demanded an explanation, the utility "failed to respond to over 20,000 dig notice requests, and only partially responded to many others." According to Michigan's damage prevention law, a utility "may be ordered to pay a civil fine of not more than \$5,000 for each violation."

Federal pipeline safety regulations (49 CFR § 192.707) require that "a line marker must be placed and maintained as close as practical over each buried main and transmission line." Further, § 460.727 of Michigan's damage prevention statute requires that facility operators "re-

spond to a ticket by the start date and time for the excavation... by marking its facilities in the area of the proposed excavation or blasting in a manner that permits the excavator to employ soft excavation to establish the precise location of the facilities" within three days of One Call notification.

On June 29, 2019, six national contractor organizations, including the American Pipeline Contractors Association, American Road and Transportation Builders Association, Associated General Contractors of America, Distribution Contractors Association, National Utility Contractors Association, and Power and Communication Contractors Association, collectively encouraged the state enforcement authority to take appropriate action. In a letter to MPSC,

these associations pointed out that the utility's conceding that it had "not met expectations" was an extraordinary understatement and their plan to hire a third locating contractor to help complete the remaining marking requests was "a seemingly underwhelming response to an overwhelming number of violations."

The Michigan State Attorney General indicated an intent to enforce the law, saying that "[t]imely and accurate responses to MISS DIG requests are essential to safeguard the people of our state and our energy infrastructure..." and that "by neglecting to respond to these requests, utility companies put our residents' lives in the balance, creating significant safety concerns for the consumers and their surrounding communities."

This utility was facing possible fines upwards of \$100 million. Unfortunately, after tough talk of meaningful enforcement, in the end, the utility was fined a meager \$545,000.

MINNESOTA

When a local news network outside Minneapolis, Minnesota, reported that a large telecommunications carrier was under investigation for failure to meet its locating responsibilities, these associations wrote to the Minnesota Office of Pipeline Safety, which has enforcement jurisdiction over pipelines as well as other underground facilities.

The telecom carrier was facing violations for late or non-responses to more than 68,000 locate tickets, 10,000 of which went completely unanswered. While there were claims of unprecedented ticket volume, the carrier had recently released its locator, one of the largest locating companies in the country, at the beginning of "dig season."

Minnesota state law requires underground facility operators to locate their facilities within 48 hours of notification of excavation activity. When



this responsibility is not fulfilled, carriers face a fine of up to \$1,000 per day, per violation. The industry letter pointed out that “unfortunately, fines associated with locating responsibilities are not normally held in the same regard as calling 811 and safe digging practices,” but that strong enforcement action can make decision-makers in charge of these operators “think more thoroughly about the consequences of poor decisions.”

Although there was not abundant information on the status of this investigation, at press time, the carrier was facing a fine of \$780,000, reflecting another weak fine for a blatant disregard of meeting statutory responsibilities.

ARIZONA

About a month after the locating debacle was reported on in Minnesota, the Arizona Corporation Commission (ACC) ordered the same telecom carrier to clear up a backlog of thousands of line-location requests after the carrier made the same changes in its locating personnel in Arizona. By May of 2019, the carrier had a backlog of some 32,000 requests to locate and mark its facilities as

required under Arizona’s “blue-stake” laws.

Like Michigan, the carrier faced possible penalties of up to \$5,000 per violation and would be liable for all damages, reflecting a staggering \$160 million citation. In August, ACC required the carrier to pay a \$115,000 fine for 30 late blue-stake tickets issued in the Phoenix area between the end of May and early July.

The associations working to convince state authorities to do their job have made the point that rash actions like changing contract locating personnel at the beginning of construction season in pursuit of cost savings, coupled with a complete lack of contingency planning, “puts America’s infrastructure at risk and absolutely compromises public safety.” Unfortunately, state enforcement actions have been woefully inadequate.

INCENTIVIZING BAD BEHAVIOR

This problem is becoming rampant across the country, and the lack of adequate state enforcement is only making matters worse. Insufficient penalties not only undermine the spirit of the law, they incen-

tivize some operators to pay negligible fines rather than do what is needed to comply with it.

At a time when a diverse range of stakeholders are calling for increased enforcement of damage prevention laws, it is becoming clear that noncompliance with facility locating requirements is often a business decision based on costs, not a matter of lacking the necessary resources to appropriately respond to increasing numbers of locate requests.

A 2006 pipeline safety bill mandated Congress to establish protocols for federal enforcement of state damage prevention law in states deemed to have “inadequate” enforcement. While the underlying intent was to crack down on excavators who fail to call 811 prior to excavation or do not follow safe digging practices, it is clear that some operators need to face strong enforcement action in order to change their reckless disregard of meeting their responsibilities. Federal pipeline officials and the many state enforcement authorities overseeing the damage prevention process need to up their game in enforcing both sides of the damage prevention coin. **DP**

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Solving Tracer Wire and Telecom Locating Issues

BY MONTE HARNDEN

Many problems related to accuracy on tracer wire and telecom wire locate systems are directly related to a poor understanding of locating principles. To minimize excavation damage, I would like to expose some of the issues.

THE BASICS

Electromagnetic locating equipment usually consists of two pieces - the transmitter, which sends AC electrical energy along a conductive target and generates an electromagnetic field that surrounds the target; and the receiver, which detects this electromagnetic field and interprets the signal. For accurate locates, the electromagnetic field must be round. If the field is distorted or bent in any way, accuracy is seriously compromised.

When a transmitter sends electricity along the target conductor, an electrical return path to the transmitter must exist to complete the circuit. If the outbound electricity cannot return to the transmitter, the circuit is incomplete and no energy will flow. This means an electromagnetic field does not exist, making locating the utility impossible.

There is a huge difference between locating steel pipeline and wires. Steel pipelines are large electrical conductors with relatively thin coatings. When the transmitter energy is applied to a pipeline, electricity travels down the pipe and "leaks" out through the thin coating into the surrounding soil and returns to the transmitter ground rod thus completing the

Figure B

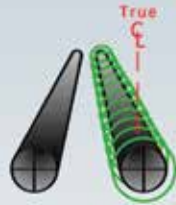


Figure A

Figure C

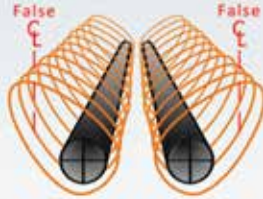
Low Frequency

- Signal Stays on the Intended Target
- Requires a Direct Connection
- Requires Far-End Grounding
- Very Accurate Locates



High Frequency

- Signal Collects on Nearby Conductors
- Very Susceptible to Distortion
- Not Accurate
- Bad Locates



FREQUENCY CHARACTERISTICS

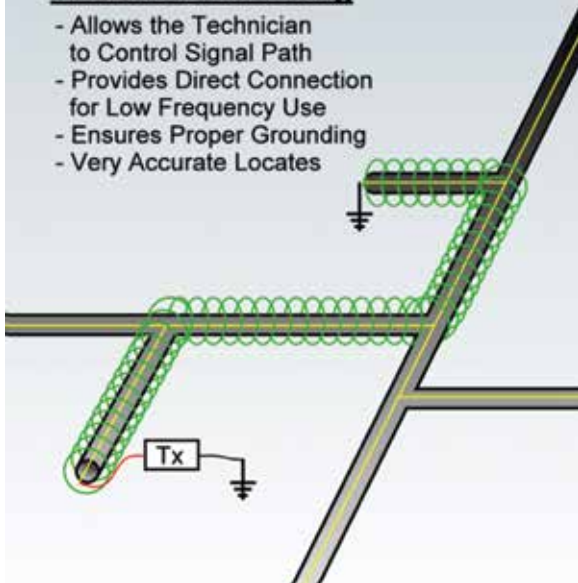
Low frequency creates a relatively small, compact electromagnetic field which tends to stay on the intended target conductor. This translates into cleaner, more accurate, locate results. But low frequency can't jump air gaps like high frequency can, which is why it requires far-end grounding.

High frequency creates a very large, intense electromagnetic field which readily bleeds over onto unintended conductors. When unintended conductors enter these large electromagnetic fields (particularly if running parallel) the intensity of the field generates AC electricity on these foreign conductors. They then create their own electromagnetic fields which compete for space with the original field. When this happens, the electromagnetic fields either attract or repel each other which distorts the original field (see Figure C). This means that accuracy is seriously impacted.

Figure D

Selective Grounding

- Allows the Technician to Control Signal Path
- Provides Direct Connection for Low Frequency Use
- Ensures Proper Grounding
- Very Accurate Locates



THE PROBLEM

Some say that far-end grounding is unnecessary. They simply turn the transmitter frequency up which forces electricity to jump to ground at the far-end. That is true, but it is a terrible practice in congested areas. It is a huge risk which exposes companies to unnecessary damage. Unfortunately, many locators are unaware of this fact.

THE SOLUTION

The story doesn't end there. Imagine a tracer wire or telecom locating system which is grounded at multiple points. If a locate technician attaches the transmitter at point A, it doesn't necessarily mean the locate path will go to point B. Since multiple grounds exist along the system, much of the transmitter energy is likely to run to the best ground, which may not be point B. Creating a strategically grounded system allows a locate technician to easily route the transmitter energy along a


circuit. Wire insulation, however, is chemically engineered to prevent electrical flow to ground. Electricity cannot "leak" into the soil through wire insulation so the far-end needs to be grounded in order to provide the necessary pathway into the soil for the energy's return trip to the transmitter ground rod. When that happens, a complete circuit is established, and energy can flow and create an electromagnetic field. Unfortunately, when tracer wire systems are poorly installed with the ends left ungrounded, it forces the locator into high frequency use (see Figures A & B).

predetermined pathway (see Figure D). The time savings alone are huge, and accuracy rises dramatically because low frequencies can be used.

POSITIVE SIDE EFFECTS

Passive locating (locating without the advantage of the transmitter) also plays an important role in damage prevention. No one should ever mark utilities without using a transmitter, but passive locating is still a very valuable damage prevention tool. Most receivers can search for weak, transient, lower frequency signals that naturally occur on some utilities. The signals include power (60Hz), radio, CATV, and other low bandwidths. These signals travel through the soil as they return to their source on routes primarily dictated by the easiest available pathway. Ungrounded locate wire systems are not attractive to passive signals because there are very few entry or exit points. This means that ungrounded locate wire systems are considerably less likely to be visible to passive searching. Even though passive locating is less accurate than active locating (using the transmitter), it is a powerful tool in the damage prevention arsenal. After the active locating is complete, performing passive sweeps double-checks for utilities that may have been missed.

SUMMARY

When locate wire systems, including telecom and tracer wire systems, are well grounded at strategic points within the system (system specific grounding), it raises accuracy since low frequency can be used. It also makes these systems much more visible to passive locating and helps minimize lightning damage issues. **All grounds should be easily interruptible and all wire segments should be easily isolated from one another. In this way, the locating technician can design the locate path rather than allowing the energy to run wild.** When locating single conductors, low frequency should be a locating technician's first choice, particularly in congested areas. Path control is highly important. Either you control the path or the path controls you. The correct choice is obvious! 

Monte Harnden retired from Marathon Pipeline Co. after 39-plus years. He is founder and CEO of Center Line Resource locator training (est. 2006) and a senior product development consultant for Tracer Wire Technologies. He can be reached at monte@tracer-wiretech.com.



LSAW Artwork Contest

Utility locators are the backbone of the underground infrastructure industry. Making timely, accurate marks keeps the public safe, protects infrastructure, and allows every other sector of the industry to operate successfully. In conjunction with Locator Safety & Appreciation Week (LSAW), *dp-PRO* is holding an artwork competition to further highlight the importance of locators' work. The competition is an opportunity for readers to showcase their artistic ability while making a contribution to LSAW's mission to increase locator safety and appreciation. The winning artist will be announced during Damage Prevention Week at the 2021 Global Excavation Safety Conference and their winning piece will be featured on the cover of the 2021 *dp-PRO* Special Locate issue.

WHAT IS LSAW?

Locator Safety & Appreciation Week is an industry-wide celebration of locators and the work they perform. Their hard work and dedication ensure the safety of the public and the protection of infrastructure we all rely on. LSAW is an opportunity for the industry to say "thank you" to locators for all that they do.

It's also an opportunity to educate locators and the public on the possible hazards in the field. LSAW places a special focus on the top 10 hazards locators face on the job. This safety-gear focus has two goals: One, to remind locators to follow best safety practices – when they stay safe, the public stays safe; and Two, to provide education to the public and others in the industry who may be unfamiliar with the hazardous elements of the job. Understanding the hazards locators face can grow public awareness and appreciation for locating work.

forms of art are encouraged including, but not limited to, photography, illustration, and painting. Creativity is heavily considered in the selection process, so have fun with it! Additionally, submissions should clearly illustrate one of the top 10 hazards, be relevant to the theme of locator safety, and be visually appealing. Artwork submissions will be accepted through Saturday, September 19, 2020.

The artwork submissions, with artist names removed, will be voted on by the readers of *dp-PRO* from December 1, 2020 – February 1, 2021. Voting will take place at locatorsafety.com. The winning submission will be announced at the 2021 Global Excavation Safety Conference.

The winning submission will be celebrated on the cover of the 2021 *dp-PRO* Special Locate issue and will become the featured poster for 2021 LSAW, April 19-25.

HOW TO ENTER

1. Go to www.locatorsafety.com and click on the contest tab.
2. Upload your poster submission paired with your Statement of Originality.
3. Once your entry has been received, you will receive a confirmation email. **DP**



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THE TOP 10 LOCATOR SAFETY HAZARDS

Find additional information on each of the top locator safety hazards and how to combat them at locatorsafety.com.

1. Confined Spaces
2. Threats to the Eye
3. Climate & Weather
4. Dog Bites
5. Punctures & Foot Trauma
6. Poison Ivy & Other Skin Threats
7. Insect Bites & Stings
8. Walking, Lifting, Bending, & Squatting
9. Slips, Trips, & Falls
10. Time on the Road

THE CONTEST

Artists are tasked with creating a piece of original art depicting one of the top 10 locator safety hazards. All visual

IMPORTANT INFO

Find additional information on each of the top locator safety hazards and how to combat them at locatorsafety.com.

Submission start date:
3/25/2020

Submission end date:
9/19/2020

Voting dates: 12/1/2020 –
2/1/2021

Submit or learn more at:
locatorsafety.com



TOP 10 LOCATOR SAFETY HAZARDS

1. Confined Space
2. Threats to the Eye
3. Climate & Weather
4. Dog Bites
5. Punctures & Foot Trauma
6. Poison Ivy & Other Skin Threats
7. Insect Bites and Stings
8. Walking, Lifting, Bending and Squatting
9. Slips, Trips & Falls
10. Time on the Road

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Locator Safety & Appreciation Week™

Last full week of April
LocatorSafety.com

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Leading Practices for Cross Bore Risk Reduction:

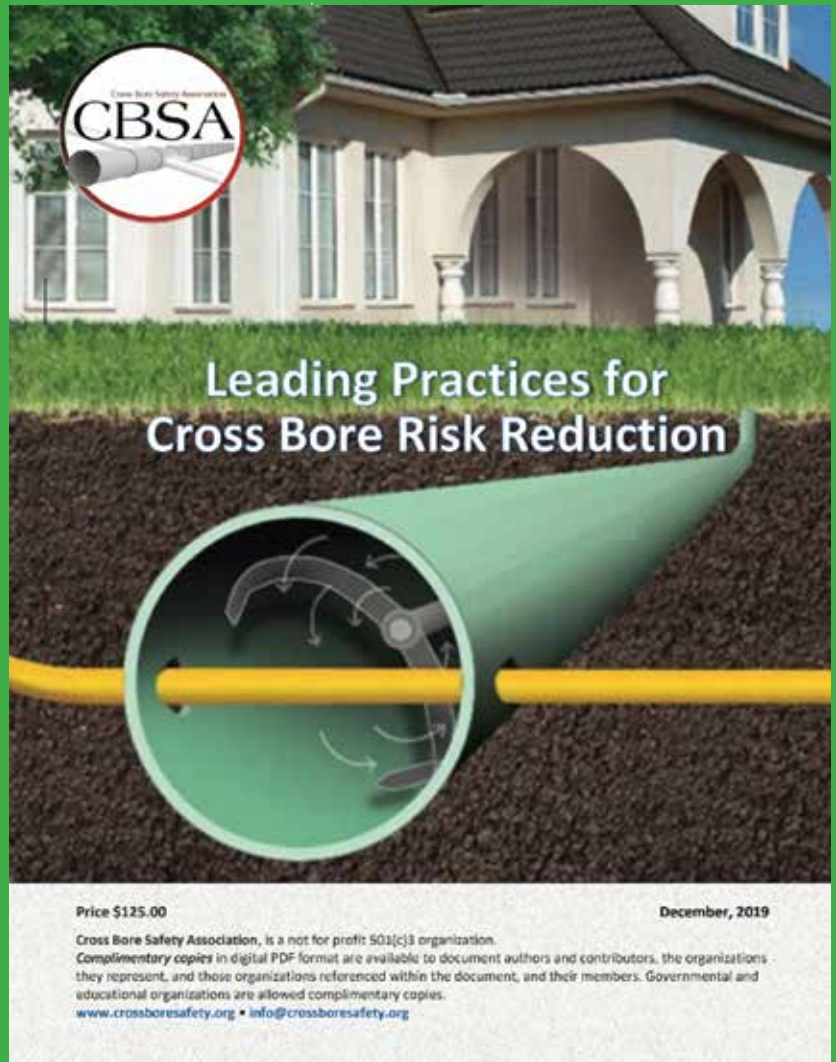
New Excavation Damage Prevention Recommendations

BY MARK BRUCE

The Cross Bore Safety Association (CBSA) and numerous participating organizations and individuals have combined efforts to assemble the most comprehensive collection of recommendations to date for reducing the risk of creating new cross bores and eliminating existing cross bores in the recently published *Leading Practices for Cross Bore Risk Reduction*. Stakeholder recommendations, which are included in detail, are intended to serve as a guide to utilities, installation contractors, inspection providers, public outreach, drain cleaners, public safety regulators and public utility rate makers.

Cross bores are an intersection of an existing underground utility by a second utility resulting in direct contact and damage. While trenchless installation methods offer numerous advantages, utilization of these methods must also ensure no cross bores are created in the interest of protecting the public, workforce safety and enterprise value of the companies involved.

Cross bores were first recognized at a federal level in a 1976 NTSB Safety Recommendation, which resulted from an incident in Wisconsin involving the injury of four persons and



death of two persons from a natural gas line that was installed through a sewer lateral. Since then, and especially within the last decade, natural gas line cross bores traversing sewers have been the primary focus of cross bore prevention efforts; in large part, due to the potential for catastrophic results. The new *Leading Practices* estimates 300,000 cross bores have been or will be found in the U.S. and Canada, an average of approximately 0.4 cross bores of gas distribution lines intersecting sewers per mile. While the range of risk varies widely between gas service areas and the variability of sewer installations, with costs of a single incident reported as

high as \$30 million, the prompt location of existing cross bores and prevention of future cross bores is of immediate importance.

Opportunity for regulators to mitigate these risks includes recommendations that sewer utilities locate their infrastructure in the same manner as other utilities. Legal hurdles do exist, as lateral



THE FIRST-EVER Leading Practices for Cross Bore Safety Course, developed by the Cross Bore Safety Association, is scheduled for March 23, 2021 during the Global Excavation Safety Conference in Tampa, FL. Learn more and sign up for updates at GlobalExcavationSafetyConference.com.

sewers are often not owned by the sewer utility, but instead by the structure owner who is unlikely to have the means to perform inspections. Potential solutions for legal elements are discussed. Other opportunities for regulators to improve cross bore risk reduction is to fund legacy cross bore removal programs with rapid rate recovery mechanisms. Legacy cross bores can be viewed as part of a construction program that should have been performed at the time of construction, even though long in the past, allowing construction-related cross bore inspections and associated costs to be, in essence, a part of capital programs.

For natural gas installations, *Leading Practices* recommends a combined approach including pre-construction location of existing sewers and a post-construction inspection to verify the sewer has not been intersected. Robotic and manual cameras are the most widely used tools for pre- and post-construction inspec-



tions and all processes are recommended to be verifiable and include QAQC to ensure high confidence results. Confidence in these verifications is increased by collecting GPS data points for viewing in GIS mapping software to ensure the correct area was inspected and the distance of inspection traverse was beyond the risk. Another recommended option is to pre-locate all sewers followed by daylight/vacuum excavation at each crossing. The viewing of the crossing would require a GPS location and photo or video of the crossing to meet the verifiable recommendation.

Public outreach is a cost-effective first step, informing occupants and drain cleaners of the risk of cross bores, thus allowing safer clearing of sewers. As part of this outreach, natural gas utilities should provide website information and onsite support for drain cleaners where trenchless construction was used.

The *Leading Practices for Cross Bore Risk Reduction* is free to those that are members of CBSA or a participating, referenced, governmental or educational organization. **DP**

Mark Bruce is President, Cross Bore Safety Association. Learn more at crossboresafety.org.

SAFETY VIDEO

The video contains valuable information about Pipeline Safety:

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UTILITY LOCATING IDENTIFIES AND MARKS

underground public and private utilities, including sewer and water, electric, oil and gas, telecommunications, fiber optics, and more.

Locators provide detailed information about the presence and location of underground infrastructure assets to prevent possible damages during excavation and other activities. Not only do underground infrastructure assets need to be protected, but they can also pose a potential safety hazard to workers onsite, the public, and property if damaged.

Like the buried infrastructure they are seeking and identifying, locators are generally unknown to the public. And, like all buried infrastructure and utilities that we all depend upon at home and at work, locators are everywhere! Locators can be found working on quiet residential streets or busy thor-



utility locators with a minimum of three years in the locating industry. In order to qualify for DPT 200, applicants must provide a signed letter from their employer, on company letterhead, confirming they have the required practical experience. This accelerated program covers the same material as DPT 100 but with a large portion of pre-work completed prior to class.

After successfully completing the DPT 100 or DPT 200 course, with a passing score of 80% or greater, the student receives and retains a copy of their transcripts. After the required practical locating experience requirements have been met (DPT 100 is a minimum of 6 months, DPT 200 is a minimum of 36

ORCGA

DPT® CERTIFICATION PROGRAM

BY DOUG LAPP

oughfares and highways, in dense urban cityscapes and across farmlands.

Locators are employed by municipalities and utilities, specialized locating companies, engineering firms and excavation contractors in order to enable hundreds of construction, geotechnical and engineering projects throughout the world, every day.

The Ontario Regional Common Ground Alliance (ORCGA) runs a very successful Damage Prevention Technician, DPT® Certification Program that provides instruction on the fundamentals of locating based on processes employed by specific industries.


Developed with the Province of Ontario, Humber College, and numerous subject matter experts, the program combines in-class instruction, field awareness review, and an on-the-job competency assessment.

Recognizing that not all locators have received the same type of training, ORCGA ensures all locators receive the same base material. Based on observed skills, employers provide the confirmation that the individual is performing their tasks in a competent manner.

The program is broken down into two parts. Part 1 of the DPT® Certification Program, DPT 100, is open to anyone. DPT 100 is a 40-hour (5 day) course combining theory and technical knowledge and is of interest to both current locators and those new to the industry. DPT 200 is a 24-hour (3 day) advanced course designed specifically for

months), the certification process can be initiated. The certification process includes submitting the following to ORCGA for certification:

- **competency assessment**
- **copy of applicant's transcript**
- **letter from employer on company letterhead verifying applicant's work experience**

The program recognizes these groups: gas/oil, power, telecom, sonde, and water & sewer. 

ORCGA is proud of the capable individuals who perform this work. We encourage them, true to their title of Damage Prevention Technician, to fully embrace their role in the prevention of damage. Learn more about this program at orcga.com/damage-prevention-training/course-info/.





TRAINING FOR YOUR GPR SYSTEM

BY TROY DE SOUZA

Over the last 15 years, GPR systems have become easier to operate, with simplified menus and more capabilities in the field. Still, it is important for the GPR operator to understand the data they are acquiring and the context in which to apply it. Too often, operators are sent into the field without adequate knowledge to perform their job properly. A knowledgeable operator should have a thorough understanding of:

EQUIPMENT:

use equipment to its full capabilities, including software for data analysis and report writing

INTERPRETATION:

interpret data in the context of the application (i.e., water pipes are buried below the frostline in northern climates so an object two feet deep will not be a water main).

METHODOLOGY:

appropriately apply GPR as part of workflow

As operators build technical skills and knowledge, they will have more confidence when interpreting data and stronger communication skills when discussing jobs with customers. Good operators would likely be retained and cultivated as an asset by their company, as it increases the organization's intellectual capital.

There are a variety of options available to further GPR learning. When looking for this type of training, it is important to look for a course with a strong emphasis on field work, including GPR for specific applications. Within the Damage Prevention industry, a course specific to using GPR within the Utility Locating discipline is especially relevant.


Not all courses are created equal. Look for Nulca-accreditation, which means the course meets the requirements set by Nulca for GPR Locating Technicians. These requirements are competency standards which ensure operators are provided the right knowledge and skills set to perform their job.

Participating in a course that provides hands-on time collecting data is extremely valuable as it allows students to interpret data in real-time. Equally as important, student-in-

structor interactions can help clear up long-held misunderstandings about certain GPR concepts.

Sometimes, traditional in-person courses are just not an option. Additional ways to learn and engage are available:

- **Training videos:** videos can demonstrate detailed operations and are great as a precursor to actual in-person training or for training new hires.
- **Webinars:** free live and recorded on-demand webinars are often available by equipment providers. Topics can range from software use to application and interpretation of data with new content added regularly.
- **Custom online training:** using conferencing software, personalized one-on-one training can be done anywhere, anytime. This is especially useful for people who are not able to participate in live courses, but still have a need to learn about GPR in a custom, personalized environment.

There are many options for training and a suitable learning plan can easily be tailored for your organization. Whichever options you choose, make sure your operators receive continual and updated training on their GPR equipment to ensure accuracy of the work performed and better results. 

Troy De Souza is training manager with Sensors & Software and invites readers to visit [sensoft.com/gpr-training-events/](https://www.sensoft.com/gpr-training-events/) to learn more about GPR training opportunities.

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- GITA/Geospatial Information & Technology Association
- Ground Penetrating Radar Systems, Inc (GPRS)
- GSSI/Geophysical Survey Systems, Inc
- Hawk Documentation
- Heath Consultants Incorporated
- HI-VAC CORPORATION
- Hydromax USA
- ImpulseRadar US
- Industrial Training Services, Inc
- InfraMarker by Berntsen
- Infrastructure Resources, LLC
- irth Solutions
- Jameson LLC
- JNR/The Claims Center
- Juniper Systems
- KCSI Aerial Patrol
- King Innovation
- KorTerra
- Krylon Products Group
- Leica Geosystems – Part of Hexagon
- LocusView Solutions
- MALA Geoscience USA, Inc
- MBW, Inc
- McLaughlin A Vermeer Company
- Mears Group
- Missouri Common Ground Alliance
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- Rust-Oleum Industrial Brands
- SENSIT Technologies
- Sensors & Software Inc
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Calendar of Events

April

- 1-3 FUCC Spring Meeting (Ocala, FL)
- 3, 4 JJ Harrison – Ram National Circuit Finals Rodeo (Kissimmee, FL)
- 5-9 NASTT No-Dig Show (Denver, CO)
- 6-8 Safety Summit 2020 (Indianapolis, IN)
- 17-19 JJ Harrison – Red Bluff Round-Up (Red Bluff, CA)
- 20-26 Locator Safety & Awareness Week (LSAW)**
- 23, 24 Oklahoma Excavation Safety Expo (Norman, OK)
- 22-26 JJ Harrison – Clovis Rodeo (Clovis, CA)

May

- 3, 4 JJ Harrison – Stonyford Rodeo (Stonyford, CA)
- 5-7 iP Utility Safety Conference & Expo (Glendale, AZ)
- 7, 8 NSC Southern Conference & Expo (New Orleans, LA)
- 9, 10 JJ Harrison – Mother Lode Round-Up (Sonora, CA)
- 11-18 Infrastructure Week
- 15-17 JJ Harrison – Penn Valley Rodeo (Penn Valley, CA)
- 18-20 NECA Safety Conference (Scottsdale, AZ)
- 21-23 JJ Harrison – Spray Rodeo (Spray, OR)
- 28-30 JJ Harrison – Wild Rogue Pro Rodeo (Central Point, OR)

June

- 10-14 JJ Harrison – Sisters Rodeo (Sisters, OR)
- 19, 20 JJ Harrison – Buckin' on the River (Pierre, SD)
- 22-25 ASSP: Safety 2020 (Orlando, FL)
- 25-27 JJ Harrison – Crooked River Round-Up (Prineville, OR)
- 30 - July 4 JJ Harrison – St. Paul Rodeo (St. Paul, OR)

July

- 8-11 JJ Harrison – Sheridan WYO Rodeo (Sheridan, WY)
- 16-18 JJ Harrison – Burke Stampede Rodeo (Burke, SD)
- 20, 21 JJ Harrison – Belt PRCA Rodeo (MT)

- 20-24 JJ Harrison – Fiesta Days Rodeo (Spanish Fork, UT)
- 30, 31 JJ Harrison – The Famous Preston Night Rodeo (Preston, ID)

August

- 8-6 JJ Harrison – Cache County Fair & Rodeo (UT)
- 9-12 JJ Harrison – Lewiston Stampede (Lewiston, ID)
- 13-16 JJ Harrison – Omak Stampede (Omak, WA)
- 18-22 JJ Harrison – Canby Rodeo (OR)
- 25-29 JJ Harrison – Horse Heaven Round-Up (Kennewick, WA)

September

- 4-7 JJ Harrison – Ellensburg Rodeo (Ellensburg, WA)
- 18,19 JJ Harrison – Othello PRCA Rodeo (Othello, WA)

October

- 5-9 NSC National Safety Council (Indianapolis, IN)
- 8, 9 JJ Harrison – San Dimas Western Days Rodeo (San Dimas, CA)
- 8-10 CCGA Damage Prevention Symposium (Alberta, CANADA)
- 15-17 JJ Harrison – The NILE (Billings, MT)
- 20-22 New Mexico 811 (Albuquerque, NM)
- 27-31 Greater Chesapeake Damage Prevention Training Conference (Ocean City, MD)
- 31 JJ Harrison – Lucas Oil AQHA World Show (Oklahoma City, OK)

November

- 4-6 Mississippi Damage Prevention Summit (Biloxi, MS)
- 30-Dec 12 JJ Harrison – WNFR (Las Vegas, NV)

To include your event in an upcoming Calendar of Events schedule, email karin@emailir.com. 

JJ Harrison: Rodeo Clown, 811 Advocate

4 million people. 325,000 miles. 8 years. 1 JJ Harrison.

ALWAYS THE CLASS CLOWN at heart with a passion for education, JJ Harrison has found the perfect partnership in the 811 Awareness Program with the Pipeline Association for Public Awareness (PAPA).

Graduating with a degree in Education, JJ worked in the classroom as a middle school teacher before throwing his hat back in the ring trying some rodeo clowning on the side in 2005. “It was fun and took me back to my roots,” he says. “Pretty soon I had rodeos calling and it just exploded – my career progressed really fast.”

Fast forward to 2012, which is when JJ was introduced to PAPA and their 811 Awareness Program. The Program allows JJ to do what he does best in using his time on stage not just for a laugh but to also educate the general public about 811.

The purpose of the program is to increase awareness of 811 with the general public in regions of the United States where rodeo events are held. The basic message includes information about using the free 811 notification service available to the public and the importance of calling 811 before digging to have all buried underground facilities located and marked by local facility operators.

Whether he’s in a jersey or western shirt, JJ educates with charm and a smile. “Being a rodeo clown is a high – you’ve got 9,000 people screaming and laughing with you, but not everyone there is rodeo savvy.” As an entertainer, Harrison says, “I try to connect them to our sport. Put together that puzzle piece for the fan. I enjoy that.” JJ advertises 811 on his jersey, barrel, trailer, and vehicles at numerous events throughout the year. He also provides attendees with information about 811 and “Call Before You Dig” at these events.

His athletic, high-energy antics have made him one of the nation’s top ro-



deo clowns. JJ is the only barrelman to ever be selected four years in a row for the RAM National Circuit Finals Rodeo which features the winners from each of the PRCA’s 12 circuits. “The Nationals are like our Super Bowl,” he says. “It’s a huge feather in any cowboy’s hat, and a big highlight of my career.”

Visit <https://pipelineawareness.org/member-resources/program-information/> to learn more about the 811 Awareness Program and how to become a supporter.

Current sponsors: Wyoming Pipeline Association, Basin Electric Power Cooperative, CPN Pipeline, Enbridge, Aera Energy LLC, WBI Energy, Avista Utilities, Sinclair Pipeline Company, TC Energy, Magellan Midstream Partners, Black Hills Energy, EOG Resources, CHS Inc., WA 811. **DP**





Why Offer Online Education to Excavators

• BY SUSAN BOHL •

WE OFTEN HEAR about different learning styles and working to accommodate a diverse workforce, but it's more difficult to know how to go about doing it. When you combine the element of outdoor excavation work with classroom or online education, it can become even more challenging. So we find ourselves asking, "What is the most effective way to reach those who work outdoors on the job site with education about safe excavation and damage prevention?"

In early 2018, OKIE811 was grappling with how to get excavators to attend our educational offerings. For more than 20 years, our 811 Damage Prevention Education Model was to provide onsite damage prevention workshops along with a meal. We figured if we fed them, they would come... right? Well that worked in the beginning and then attendance began dropping off. Though most excavators want to be safe and learn the best ways to go about it, bottom line, they have a job to do and it's not in a classroom. So how do we build it so they will come?

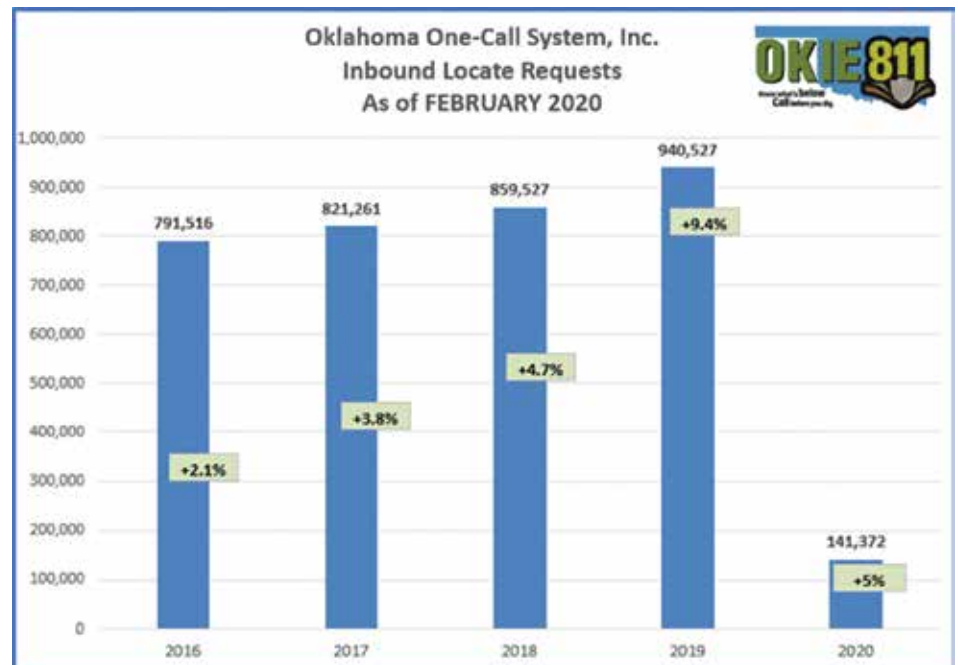
We decided to move from 100% onsite trainings and workshops to an 80/20 model, where 80% of the education was offered online or virtually and 20% was still available onsite when required attendance and time allotments were met.

We felt it was necessary to continue having an onsite workshop offering but require a minimum attendance number and ensure we had at least one hour in front of these contractors and excavators to present our dig site safety information. As a result of moving to this new model, we have been able to:

- Reach three times as many professional excavators and contractors
- Cut our training and education budget in half
- Eliminate one full-time damage prevention position
- Develop more comprehensive content to address worksite safety
- Ensure content covers worksite safety and focuses on best practices where our law falls short

We now offer multiple learning methods for those digging in Oklahoma, including:


- **Webinars:** live or recorded, no more than 30 minutes of targeted content
- **Online 811-Certification:** 1½-hour online offering, 3 chapters with a test and printed certification
- **Onsite:** safe excavation education, at least 1 hour and at least 20-25 in attendance
- **Videos:** hot topics and current events targeted to contractors who learn from the mistakes of others



- **Podcast:** contractors can listen while driving or sitting in their truck
- **Regional and statewide Excavation Safety Programs:** half- to full-day hands-on and targeted excavation safety education.

Lessons learned and pitfalls along the way:

- When there are law changes, you need to update your library of offerings to ensure recorded content is up to date.
- Ensure you have a way to track attendance and provided listings of those attending virtually since there is no sign-in sheet.
- Coordinate with your state's pipeline safety authority to ensure the content and virtual signatures will be enough reporting attendance.
- Members think you're no longer providing damage prevention because you're not calling it that anymore.

If you asked me if we're happy with the results of broadening our education and training offerings, I would definitely say yes. I wish I could report that damages across Oklahoma have decreased, but we do not have comprehensive centralized damage reporting. This change just went into effect in mid-2018, so it's a little too early to say if we are affecting damages. However, I can report that we had the highest increase in ticket volume in Oklahoma during 2019. It's my assessment that our improved education and outreach has contributed to this increase! 

Susan Bohls is Executive Director of OKIE811/Oklahoma One-Call. She can be reached at sbohl@okie811.org.

SPECIAL REPORT

BY LEE RICHARDS

One Call Spotlight: OHIO811

Each year, representatives from OHIO811 and their member utilities participate in dozens of trade shows and community events across the state of Ohio. They interact with thousands of contractors and excavators, vendors, homeowners, farmers and students distributing literature, color-coded cards for locating utility lines and branded merchandise promoting OHIO811 and their “Call 811 before you dig” message.

They inevitably encounter the challenge of engaging attendees for a long enough period of time to share the consequences of unintentional damage to underground facilities, including the potential for severe bodily injury, property, environmental and infrastructure damage, and disruption of critical utility services.

The new OHIO811 trailer is a mobile classroom, attracting and retaining visitors of all ages with a unique interactive educational experience. Walking through the trailer, guests are enveloped by three-dimensional displays on the walls and under their feet, showcasing the maze of pipelines, cables, wires, conduits, and other types of utility infrastructure commonly found under the yard of a residential home. Videos promote the OHIO811 process for requesting utility locations, and a multi-sensory dig box simulates the hidden dangers posed by damaged facilities.

Additional interactive displays of the OHIO811 mobile app and damaged facilities, as well as 30-90 second videos for the trailer’s indoor and external monitors, are in development to accompany the OHIO811 trailer.

This project began as the vision of an OHIO811 member. She wanted to create an interactive educational experience to further the 811 and safe digging messages. Since there is not a



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Ron Peterson

Director, National Utility Contractors Association (Nulca)

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Mapping the Underworld Initiative: A 25-Year Vision

• NICOLE METJE •

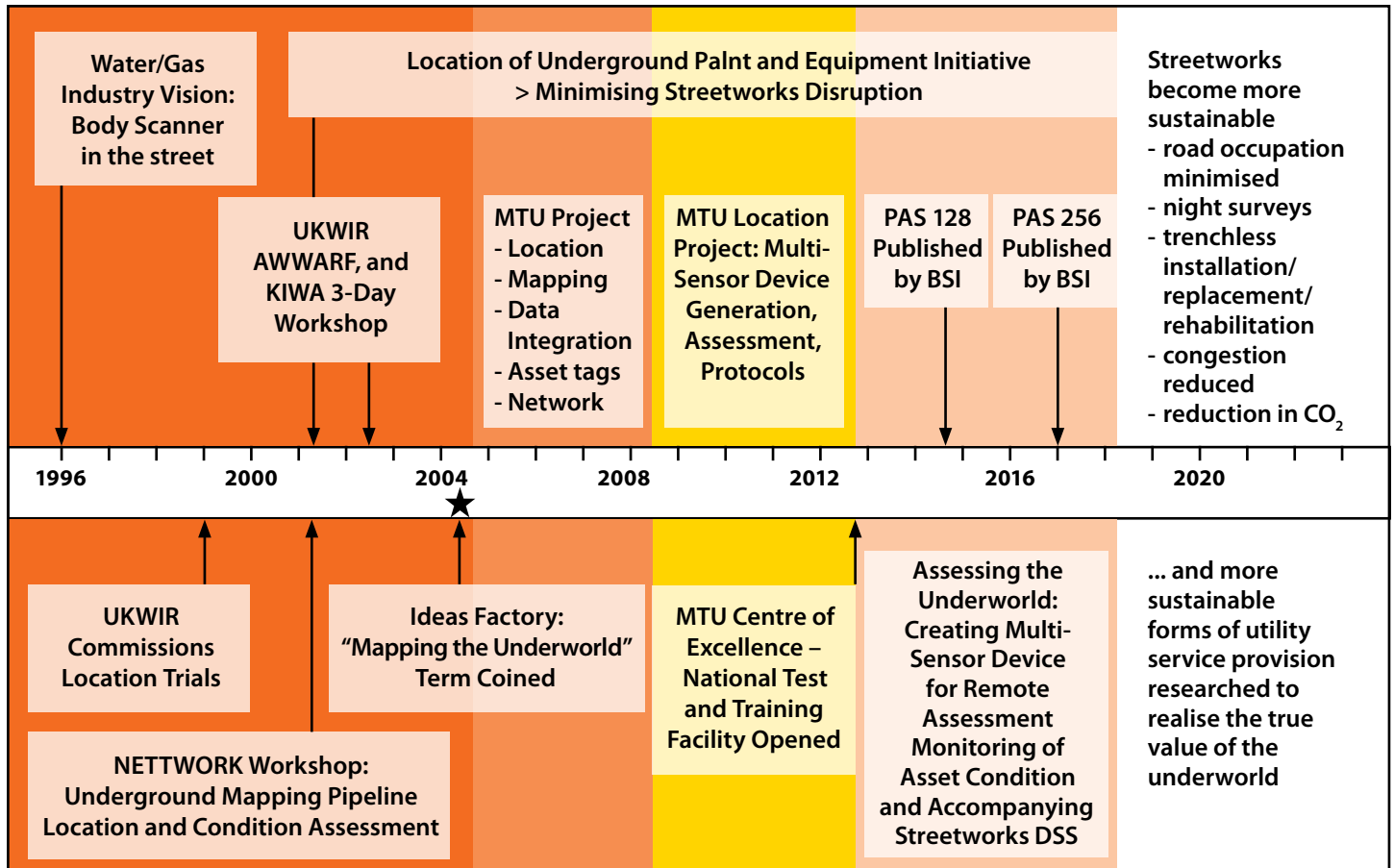
Buried utilities are vital for the functioning of today's cities as they provide gas, water, electricity, broadband and the removal of sewage and surface water. Mankind has used buried infrastructure for eight millennia, perhaps more. These assets, and their locations, are often not well documented. The Mapping the Underworld initiative started with the problem of buried asset location – we must know what is below the surface, and where it is located, if we are to engineer in the space below the streets effectively and safely. This is a problem that has been articulated by United Kingdom (UK) urban professionals for as long as the built environment has needed servicing. However, the problems associated with the location of existing buried utilities are emphatically not unique to the UK and have been presented at the International No-Dig (Trenchless Technology) conferences since they started in 1986.

It was in 1996 that Tony Rachwal, Director of Research at Thames Water, crystallized the arguments by stating that we needed a “body scanner for the street”. After significant lobbying by the industry, the UK research council funded a feasibility study to explore the need for a combination of different sensing technologies if all buried services in all ground conditions were to be detected. The multi-sensor feasibility study not only proved the concept, but also helped to define a rigorous and detailed four-year pro-

gram of work termed the MTU Location Project, or Multi-Sensor Device Project. This stage of MTU started in 2008, was completed in the summer of 2013, and is reported in its own brochure and numerous journal and conference papers, practitioner articles and other outputs.

It was always understood, however, that MTU formed part of a 25-year vision that would be complete only when streetworks engineers could be supplied with as much prior knowledge of the environment in which they are required to engineer and a comprehensive picture of the likely consequences of their engineering actions. Accordingly, funding was awarded for an ambitious follow-up program of research entitled Assessing the Underworld. Its vision was to create an integrated streetworks assessment framework encompassing the three interdependent infrastructures that coexist in our urban streets - the surface transport, buried utilities and geotechnical infrastructures - and then to evaluate the condition of these infrastructures, and to support coherent, intelligent and sustainable management of streetworks.

This four-year EPSRC-funded, cross-disciplinary, multi-university research project, which started in June 2013 and finished in May 2018, aimed to prove the concept of a single integrated model for subsurface




utility and surface transport infrastructures. These infrastructures are supported by, or hosted within, the ground (termed herein the 'geotechnical infrastructure'), and thus it can be contended that their performance is controlled to a large degree by the performance of the geotechnical infrastructure. This interdependent relationship has significant implications for the performance of all three infrastructures, where deterioration of one infrastructure can compromise the performance of the others, hence only an integrated assessment, combined with deterioration models, will provide reliable information on the performance of these integrated, interdependent infrastructures now and into the future.

Put more simply, for reasons of minimizing direct costs and to address uncertainties (of what is buried beneath the streets and its physical condition), trenching is often used in urban streets to install or maintain buried pipes and cables. Such excavations inevitably cause lateral stress relief displacements and, therefore, weaken the ground, cause differential movements in the pipes and cables that lie adjacent to or across the excavation (accelerating their deterioration, sometimes to the point of immediate failure) and weaken road structures by cutting through the slab, loosening the unbound foundation layers and patching in replacement materials. All of this is done while disrupting traffic, damaging the economy, society (inconveniencing people and the social systems that operate in cities) and the environment (e.g. exacerbating pollution).

It should be recognized that this ambitious, multi-disciplinary program has, from its inception, been a partnership between academia and practitioners. This partnership was demonstrated in a range of activities for which the academic partners are able to provide an evidence base. There exists an underlying need to form a business case that justifies the use of more expensive sensor technologies and use of advanced survey techniques. It is important to know the return on investment of spending more money on surveys upfront, or




doing things differently and the cost savings as a result. To address this gap in knowledge, a parallel study was conducted as part of iBUILD project to look into the true cost of utility strikes. Sixteen utility strike case studies were investigated where the direct costs, indirect costs (if any), and social costs (if any) as a result of the utility strike in question were estimated. The study showed that the additional costs (indirect and social costs) when accounted for, can be as much as 29 times larger on average across all 16 case studies than the direct cost of repair, which is more often than not the only cost consideration made by industry in the event of a utility strike incident. A change in perception and a corresponding change in the current streetworks business models is required to address this ongoing streetworks challenge. For example, Transport for London (TfL) has already changed some of their practices when it comes to utilities streetworks, by way of a memorandum of understanding in cooperation with several asset owners, with a focus on best practice implementation of PAS128.

A recent development has been the formation of the UK Collaboratorium for Research in Infrastructure and Cities (UKCRIC). This is a once-in-a-generation investment from the UK Government of £128m, matched by funding from industry and the collaborating institutions, to establish capital facilities at 14 universities. The investment includes the National Buried Infrastructure Facility (NBIF) at Birmingham, which will drive research, development and innovation in trenchless technologies, utility detection and management and geotechnical engineering. 

Nicole Metje is Professor of Infrastructure Monitoring in the School of Engineering at the University of Birmingham, UK. She is also Deputy Director for Sensors of the National Buried Infrastructure Facility (NBIF). She is involved in utility detection standards in the UK, U.S. and Hong Kong. Nicole can be reached at N.Metje@bham.ac.uk.



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Pre-Excavation Checklist Before **EVERY** Excavation

IN THE OFFICE

- Review all drawings, plans, engineering blueprints for existing buried facilities
- Proposed excavation area has been marked in white paint and/or flags
- Call 811 at least 2-3 business days before excavation (check your state One Call laws)
- Locate ticket number is posted at the work location
- Onsite meeting scheduled with all high profile facilities in locate area (gas/oil pipelines, high-voltage cables, fiber optic)

ONSITE

Complete a pre-excavation walkthrough of the entire jobsite and adjacent areas

Visual Inspection of Jobsite: Permanent markers:

- Signs or marking posts
 - Pavement markers (stamped nails, pavement decals, A-tags™)
 - Surface markers
- Other surface signage for landscaped areas
- Locate marks
- Consult any maps or field sketches of the location
- Identify all services to buildings such as:
 - Gas meters
 - Farm taps

- Pipeline valves
- Cable pedestals
- Electric cables
- Water valves
- Telephone closures
- Look for evidence of trench lines from previous excavation
- Look for cleared pipeline ROWs
- Talk with the property owner or general contractor to identify potential private facilities that may not be marked:
 - Lighting
 - Outbuildings
 - Pools/Spas
 - Irrigation
 - Sewer laterals
 - Propane tanks
 - Communications lines

Document of Jobsite:

- Compare actual jobsite to One Call ticket
 - One Call ticket covers the scope of the work
 - One Call ticket "Work to Begin" date is valid
 - All utilities have responded
 - All facilities are marked within the excavation area
- Photograph the jobsite
 - Locate marks and flags from 360° at varying distances for perspective
 - Permanent signage and location relative to the dig area:

- Note location, height, and operator of overhead lines
- Note all required safety signage

- Video and/or sketches where pertinent

BEFORE YOU DIG

- Review safety information with anyone working the job
- Confirm with facility owner vacuum or hydro excavation is scheduled for all pipelines impacted
- Locations for hand digging within the tolerance zone are noted
- Representatives for all critical facilities are present
- Emergency equipment available when hazardous atmospheres are potentially present
- List of all emergency contact numbers for assets in and adjacent to the dig zone is readily available
- The location and route to the nearest hospital is known by onsite supervisors

This document is provided for informational purposes only and does not constitute professional advice. It is intended to be used as a guide in the development of a checklist specific to your situation and may not be inclusive of all pre-excavation activities required of your situation. Consult your company's appropriate management before implementation. Excavation Safety Guide, its employees and agents accept no liability and disclaim all responsibility for the consequences of acting, or refraining from acting, in reliance of the information contained in this document or for any decision based on it, or for any consequential, special, incidental or punitive damage to any person or entity for any matter relating to the contents of this document.

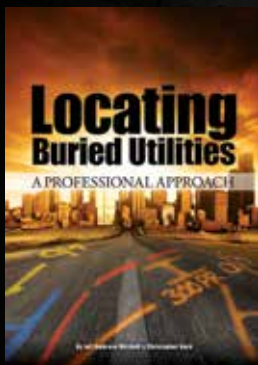


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"[This book has] been a big help for me, who's new to the industry and I really enjoyed it. I like to be able to answer all of the questions asked by clients, supervisors, co-workers and passersby and your book has helped me to do so."

— John D. Simpson

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LOCATING



BY CHRISTOPHER KOCH

As Long AS YOU'RE HERE...

As a private utility locator, my day differs from that of a contract locator. While they typically work from a laptop containing an ever-refilling queue of work due two to three days from now, and have fluidity in their route and schedule within that constraint, I go to a series of appointments scheduled with just enough time to finish the work at one and get myself to the next.

My office manager has scheduling down to a delicate science. She takes a call, finds out what needs to be located and where, asks when the work needs to be completed by, and tries to slot the appointment into a route she's building on the fly. When it works well (which it does most of the time), I breeze from appointment to appointment greeting my customer, marking the needed facilities, completing paperwork, and heading off to the next job with just enough time to use the restroom or grab a splash of gas. Putting together a whole week of those days is a thing of beauty.

A few years ago, in a piece called "White Lines and Whoppers", I wrote about how excavators strain the contract locating system when they fail to white line and instead call in requests to simply mark an entire lot, or call for thousands of feet of ROW to be marked when they're only actually digging in a small portion. This strains the system because unlike other businesses, locating companies are statutorily required to serve their customers. Show up to Burger King at the lunch rush and you may face a long wait. They might even run out of burgers. You might be mad, but they'd never face a civil penalty.

As a private locator, you would think I'd never have to worry about excavators straining the system since I'm working outside of the One Call system (eliminating the 48-hour ticking clock), and going from appointment to appointment (eliminating the need to serve an unlimited number of customers per day). But, I have my own version of white line failure. It often begins with the words, "As long as you're here..." or "While I've got you..." and can sometimes end up doubling my time on a jobsite. It has a companion in the excavator who wedges themselves into an already full schedule with the promise that, "This is an easy one. It'll only take five minutes." It never only takes five minutes.

For me, failure to white line, calling in way more than is needed, doubling my work once I'm onsite, or making false assurances about how easy a job will be to shove into a crowded queue all equal one thing - disrespect for what I do. Hidden in all of that is the assumption that what I do is easy, disposable, and valueless. That my time doesn't matter



and that it's okay to lie to me. If you find yourself about to do any of these things, stop and ask yourself how frustrating that same behavior is when it comes from your customer.

I want to help you. But if you throw more work on me "as long as you've got me", it may have to wait until next time. **DP**

Christopher Koch is a training consultant and President of ZoneOne Locating. He is past president of Nulca and worked on both the 2009 and 2015 revisions to the Nulca Professional Competency Standard. He can be reached by email at Christopherkoch@live.com or on Twitter @kochaauthor.

THE OPINIONS EXPRESSED IN THIS ARTICLE ARE THOSE OF THE AUTHOR. dp-PRO WELCOMES AND ENCOURAGES ARTICLES AND CORRESPONDENCE FROM ALL POINTS OF VIEW.





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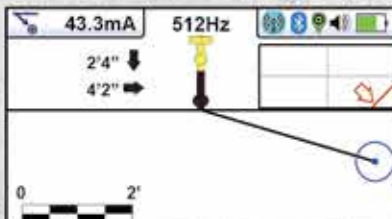
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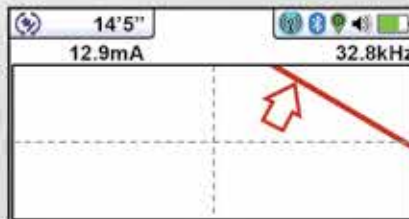
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- Optional receiver/transmitter link
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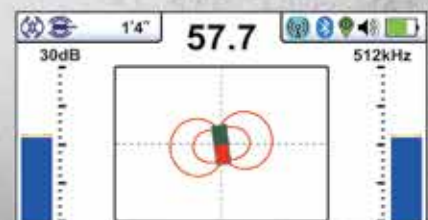
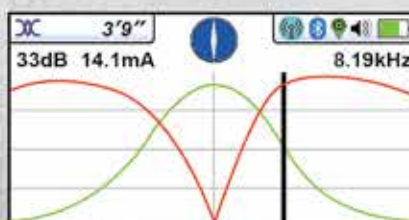
^ **Vector Locate** - shows orientation, line position, and distance relative to the locator in 3D

> **Transverse Plot Screen** - is used to display the peak and null to compare distortion shape



< **Plan View Screen** - displays the theoretical line in 2D from above ground in omnidirectional mode

∨ **Sonde Screen** - arrow guidance showing direction to the sonde and depth of cover



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