

OTD

Operations
Technology
Development



Safe
&
Secure

As natural gas utilities grapple with an aging infrastructure, new pipeline integrity regulations, climate change, environmental impacts, alternative sources of supply and a continuous effort to improve operating efficiencies, OTD's work has become increasingly important. Initiatives supported by OTD have successfully addressed these growing issues for natural gas distribution utilities.

Since 2003, OTD has focused on infrastructure needs ranging from simple tools like the pavement breaker lift assist that helps utility personnel reduce the risk of personal injury to game-changing technologies like the acoustic pipe locator that is able to find plastic pipe without the use of tracer wire.

OTD is a not-for-profit corporation led by its 19 members who serve over 26 million natural gas consumers in 27 states and Canada. Through collaborative research and technology development, OTD member companies pool their resources and leverage available funding to ensure that complex tasks are becoming easier to accomplish, expensive activities are becoming less costly, and risk is becoming more manageable.

One thing that remains constant is change. The energy industry will continue to evolve, and OTD provides its members the ability to anticipate changes and adapt their operations through technology improvements.

What follows is a small sample of the nearly 100 projects that OTD has sponsored on behalf of the natural gas industry and its customers.

Technology supporting natural gas infrastructure



OTD Technology Highlights

Demonstration Opportunities



GPS-Enabled Leak Surveying and Pinpointing

Automating the leak surveying and pinpointing process with GPS eliminates the need for paper forms and records, provides increased efficiency and more reliable compliance documentation. The GPS-enabled system available from InMaps has been commercialized as the VeroTrack, and implementation is underway at several utility companies.



Keyhole Tools and Processes

Small hole tools and processes substantially decrease excavation and restoration costs, while reducing public inconveniences and increasing safety. Some of the most significant keyhole developments include the validation of the keyhole restoration process, the micro-excitation tool, automated welding, soil-compaction measurement, and keyhole standards.

One particular example is the ULC Robotics PRX250K keyhole pipeline inspection camera system. The camera is inserted via a keyhole, and is small and flexible, making it easily maneuverable through tight bends, allowing utilities to examine pipe segments without the need to drill additional access holes for hard-to-reach locations.

Pavement Breaker Lift Assist

This device, available from Integrated Tool Solutions, assists utility workers in lifting the pavement breaker after the bit has broken through the surface of the street and needs to be repositioned for the next penetration. It allows construction crews to maintain a high productivity level and helps to reduce the risk of injury.



Flash Shoring (Shielding) System

This lightweight shielding system provides lower-cost methods for accessing, repairing, and rehabilitating underground pipes and facilities in congested areas where other utility lines are present. It can be easily transported (with one utility truck) and can be installed by one person without heavy equipment in about 20 minutes. It is commercially available from PRO-TEC Equipment, Inc.



Micro-Excavation System

The Micro-Excavation System, available from Concept Engineering Group Inc., is a fluid lance technology that enables excavation of small-diameter openings in soil, including difficult-to-penetrate soils—lowering associated excavation and restoration costs and decreasing activity disruptions. It employs compressed air and water to excavate holes of approximately four to six inches in diameter for tasks such as verification of utility line location.



Efficient



Polyamide 12 (PA12)

PA12 is a high-strength thermoplastic material that can be safely used at higher pressures (up to 250 psig) and temperatures, providing a cost-effective and easy-to-install alternative to steel piping systems.

PA12 has been evaluated for use as gas-distribution piping in North America, and technical support necessary to obtain regulatory approval for its use in the U.S. is being developed. Extensive testing of materials resulted in a comprehensive database of the physical properties of PA12 pipe and demonstrated conformity to ASTM standards.

New Product Pipeline



Metallic Joint Locator

This patent-pending technology has been field demonstrated to successfully locate joints and various appurtenances on metal pipes (bell joints, encapsulated joints, clamps, tees, couplings, etc.) from above ground at depths of more than four feet. Commercially-available units, known as the Ultra-Trac MJL, are available from SENSIT Technologies.

Portable Methane Detector

Through the use of optical-detection technology, the handheld PMD device offers sensitivity and cost advantages over conventional techniques employing flame ionization detectors. The technology improves the efficiency of walking leak surveys, is less costly to maintain than other technologies, and can detect leaks from low ppm to 100% gas. SENSIT Technologies is marketing the product as the Sensit PMD.



Meter X-Changer™ Tool

The suite of tools known as Non-Interrupting Meter Change-Out (NIMCO) technology is designed to provide utility crews with a cost-effective solution for performing routine commercial and residential meter exchanges. The Meter X-Changer allows for continuous natural gas flow during the meter replacement process, increasing productivity and virtually eliminating the impact on customers. The technology has been licensed to Mueller Company,

and commercially-available units are anticipated in 2010. Another tool in the suite—the Directional Bag Stopper (DBS)—has also been licensed to Mueller Company.

Handheld Acoustic Pipe Locator

A hand-held device that accurately locates both steel and plastic underground pipes, this technology uses acoustic energy which is transferred directly into the soil in a series of pulses. Underground objects reflect the sound back to an acoustic receiver located above ground. Validation testing at various sites was conducted in late 2009 and a commercializer is expected to be selected in 2010.

Automated Welding

A system for remote and automatic welding through small-diameter (18-inch) keyhole excavations combines the benefit of lower excavation and restoration costs with a consistent high-quality weld. The system also allows crews to install stopper nipples and other lateral-type fittings.

Working with the commercialization partner, several manufactured prototypes with rotational and drive motors for positional feedback are being evaluated by the utilities in 2010. The final design of the unit will include models for both bench top and field applications.



Reliable

Analytical Tools and Reports

Biogas National Guidance Documents

New, alternative fuels need to be thoroughly tested to maintain the integrity of the distribution infrastructure. The North American Dairy Biogas Guidance Document provides the analytical requirements needed to safely interchange dairy-produced biogas into existing local distribution company supplies. Ongoing development efforts focus on additional methane sources such as landfills, wastewater sludge, and agricultural waste.

Pipeline Coatings

Investigators are testing a wide variety of products in an effort to develop a corrosion-prevention coating system that can be applied over gas piping with little or no surface preparation. Major applications are for pipes and equipment located in vaults and other high-moisture environments that are difficult to access for coating operations.



Researchers have also investigated the use of thermal spray coatings (TSC) for long-term (50 to 70 year) pipeline corrosion protection. Applicable in various pipeline environments, the technology is especially beneficial for use in critical locations and on pipelines that are difficult to access. Data developed through this project will advance TSC technology and provide pipeline operators with information to enhance the integrity of their systems.

Pipe Damage Assessment and Repair Options

Mechanical damage to transmission pipelines caused by excavating equipment is one of the most common threats to pipeline integrity. The code of Federal Regulation 49 Part 192 addresses the repair requirements for damaged steel pipelines operating at stress levels at or above 40% SMYS. The CFR code also addresses the integrity management options for transmission pipelines operating at or above 20% SMYS and in high consequence areas.

Guidelines for pipelines operating below 40% SMYS have been developed to assist in the field evaluation of the severity of mechanical damage. A web-based computer application, derived from a numerical model and pipe tests, assesses pipe repair options based on data about pipe characteristics, operating conditions, and the severity of damage entered by the user. The program, available at <http://apps.gastechnology.org/pipedamage>, then identifies repair needs and references the appropriate integrity management codes for schedule and repair options.

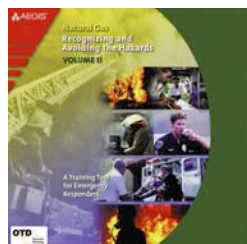
When a pipe repair need is identified, regardless of its operating pressure, the code requires that the repair be supported by engineering tests and analyses which show that it can permanently restore the serviceability of the pipe. A related GTI research initiative provided these tests and supporting analysis for the use of composite repair technologies on natural gas pipelines. The results were compiled in a web-based format for the design of the composite repair systems as per ASME-PCC2 standard. The program includes several technologies which were assessed in full-scale hydrostatic tests at GTI and provides the properties and required number of wraps for each repair system. The program can be accessed at: <http://apps.gastechnology.org/cprguide>.

For More Information

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First Responders DVDs

To help gas companies better educate first-responding personnel about natural gas emergencies, gas industry researchers and training experts developed DVD-based learning modules with realistic scenarios covering a variety of issues. Designed to enhance public and worker safety, the training product also serves to improve emergency-response effectiveness and coordination.