

2018 Pipeline Safety Trust Conference

New Research Efforts to Improve Safety

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Thank You

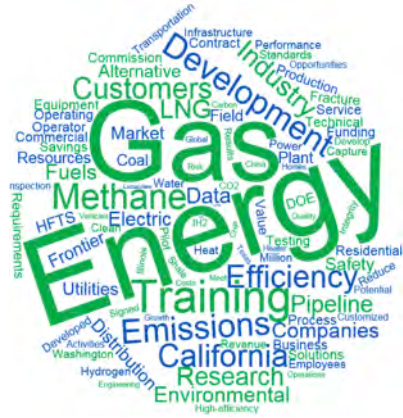
> Pipeline Safety Trust

> Sponsors of the Research

- Operations Technology Development (OTD) – 26 North American members focused on natural gas technology solutions
- DOT PHMSA – Provides 50% funding for several projects



GTI has a 75-year History of Turning Raw Technology into Practical Energy Solutions



RESEARCH & DEVELOPMENT PROGRAM MANAGEMENT TECHNICAL/ANALYTICAL CONSULTING TRAINING 360+ EMPLOYEES

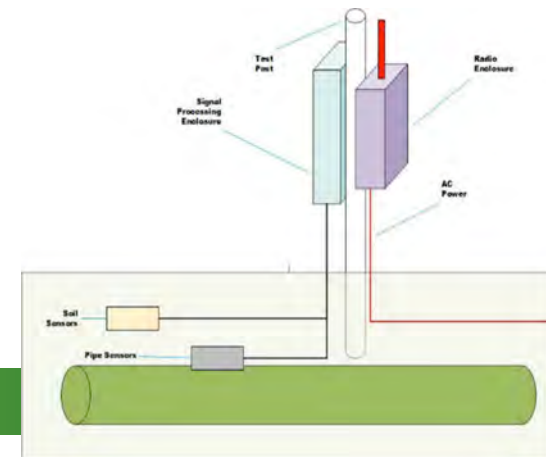


Safety-Related Results and Active Research Efforts

- > System Safety from Third Party Damage (Buried Asset Location and Awareness of Intrusions)
- > System Integrity (Inspection)
- > Methane Emissions and Leak Detection
- > Worker Safety

System Safety from Third Party Damage (Buried Asset Location and Awareness of Intrusions)

- > Ultra-Trac® APL - Locates buried pipes (all materials) before excavations and construction. Capable of detecting multiple buried plastic pipes at depths up to five feet (limited by pipe diameter.) Available from Sensit Technologies.
- > Cross Bores – Both avoiding and finding where natural gas piping has unknowingly intersected sewer pipe. Released informational videos and best practices report. Guidance links on the OTD website home page.
- > ROW Sensor Combination- Vibration, ground movement, current, and others. Active project demonstrating the feasibility of a pipeline right-of-way notification system with stationary sensors mounted on and adjacent to the pipeline. DOT PHMSA Funding.



System Safety from Third Party Damage - GPS EENS Solution Combines Data Collection, Analysis, and Awareness

Automated Alerts
Developed and Piloted
With the Natural
Gas Industry

Data Collection



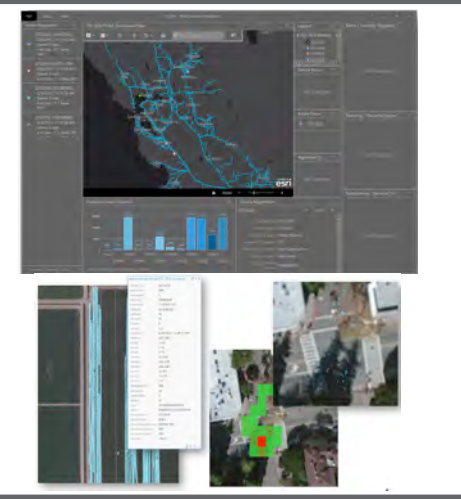
- Dedicated Device
- GPS/GNSS
- Motion Sensors
- Cellular

Analysis



- Data Management
- GIS Processing
- Activity Analysis
- Threat Analysis

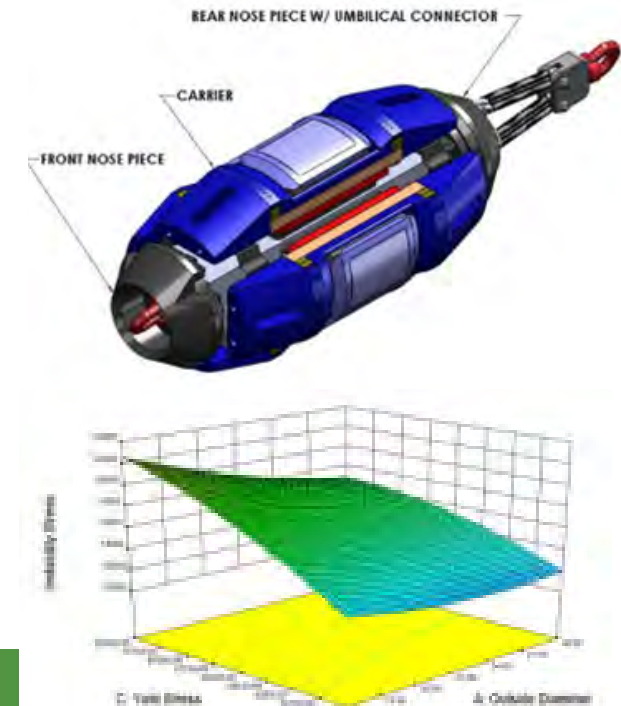
Awareness



- Utility Dashboard
- Operator Alerts
- Cell Phone Alerts

System Integrity

- > Quest Integrated Small Diameter EMAT – Current project addresses need for inspection tool for smaller diameter (e.g., 6-12”) pipes. Tool, electronics, software integration completed. Recent license agreement provides the platform. Operator field testing continues in 2018-2019. Commercial launches planned in late 2019.
- > Leak Rupture Boundary Calculator and Report – Completed results used to determine the boundary between failure by leak and failure by rupture as a function of the pipe’s Specified Minimum Yield Strength (SMYS). Input properties such as diameter, toughness, and yield strength. Use the calculator for risk modeling and consequence analysis for pipe segments.



Methane Emissions and Leak Detection

- > Portable Methane Detector (PMD) - Available from Sensit Technologies uses optical-detection technology to provide sensitivity and cost advantages over conventional techniques employing flame ionization detectors. The PMD improves the efficiency of leak surveys, is less costly to maintain than other technologies, and can detect leaks from low ppm to 100% gas.
- > Residential Natural Gas Detectors – Evaluation of what is currently on the market today. Improvements and customer education needed. The next “safety alarm” for our homes.



Methane Emissions and Leak Detection – Current Projects

- > Remote Gas Sensing and Monitoring – Leave behind sensors that communicate to the office 24/7 for very low level, hard to find, or just repaired leaks.
- > Measure Leak Flow Rate to Prioritize Repairs – All leaks need to be repaired, however, if the largest non-hazardous leaks can be identified, they can be prioritized in the work schedule and emissions minimized.
- > Gas Imaging Cameras – Are they effective allowing monitoring of a potentially dangerous leak from a safe distance, can a leak be quantified as claimed, and are they a tool for first responders.
- > Latest Methane Detection Devices – Evaluate the newest tools coming or on the market to determine their appropriate uses. Replace, add, change procedures, and change local regulations.

Worker Safety

- > Ignition Testing of Electronic Devices (Cell Phones, tablets)
- > Battery and Electric Power Tool Evaluation
- > Training DVD for Emergency Responders - Recognizing and Avoiding Hazards (Main leaks, industrial fires, odorant hazards, LNG)
- > Lift Assists for jackhammers from Integrated Tool Solutions. Ergonomic devices eliminate the need to manually lift and re-position heavy tools.
- > Lightweight Flash Shoring System from PRO-TEC Equipment provides a versatile method for underground pipes and facilities in congested areas.
- > Evaluation of Static Suppressors for PE Piping Systems
- > UV Degradation and Static Buildup Testing of Safety Vest Fabrics

Thank You

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