



NARUC

Winter Committee Meetings

Staff Subcommittee On Gas





R&D for Intelligent Utility Operations

- > Ron Edelstein
- > NARUC Gas Staff Subcommittee
- > February 2017
- > Washington DC

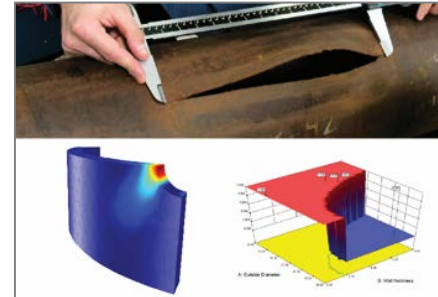
GTI Energy Delivery Programs



Inspection and Verification



Intelligent Utilities



Risk and Decision Analysis



Construction Techniques



Methane Emissions and Detection



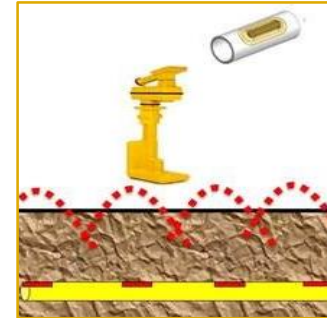
Grid Resilience

Intelligent Utilities

&

Grid Resilience

Intrinsically Locatable Technology for Plastic Piping Systems (U.S. DOT / OTD / 3M)



- **Objective**

- Develop and test a viable solution for intrinsically locatable polyethylene (PE) materials with an integral electronic marking system.
- Partner with 3M Company and a large pipe manufacturer to develop the electronic markers and attach the marker to PE pipe.
- GTI will provide third party testing and analysis of the developed system.

- **Focus**

- Complete the development, define and test the electronic marker capability, validate the attachment design, and perform laboratory and field testing.

Pipe Defense with Combined Vibration, Ground Movement, and Current Sensing (U.S. DOT / CEC / OTD)



- **Objective**

- Demonstrate the feasibility of a wireless pipeline right-of-way (ROW) defense system based on stationary sensors mounted on, or adjacent to, the pipeline.
- Analytics will correlate the data to alert operators to events of interest occurring in the ROW with minimal latency.

- **Focus**

- State-of-the-art review and gap analysis of pipeline ROW monitoring techniques.
- Design and build a ROW monitor hardware based on testing results.
- Develop a database structure and analytics to capturing pipeline data and discriminate significant events and display with a user interface to allow visualization of data.
- Deploy and field test ROW monitor system.

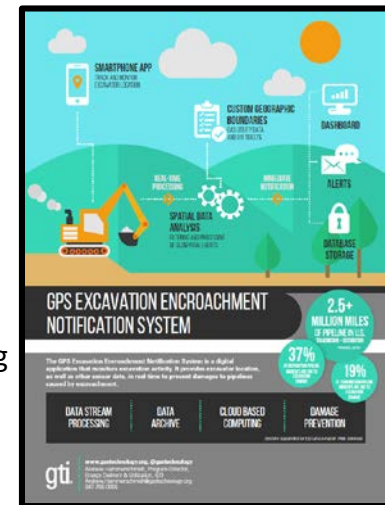
GPS Excavation Encroachment Notification System (GPS EENS)

- **Objective**

- Develop and deploy the GPS EENS technology to increase situational awareness of operating excavators and significantly reduce the risk of third party damage on utility infrastructure.

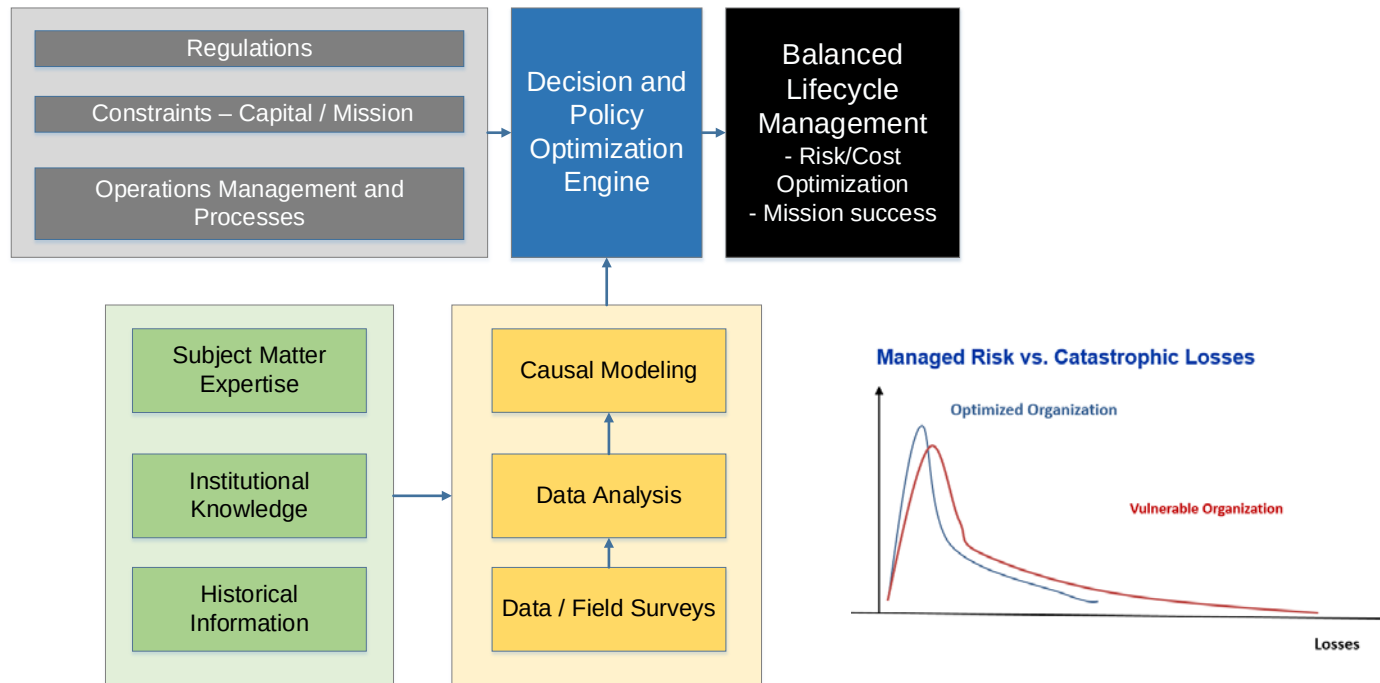
- **Focus**

- Provide high-accuracy GPS location, which overlays the utility's GIS map services, 811 ticket boundaries, and custom geo-fences (defined by Utility)
- Provide real-time indications of the “state” of the geospatially located excavator device.
- Provide instant alerts (graphical, text, etc.) to relevant parties, including alerts to utility operators/inspectors when an excavator enters an 811 boundary or ROW, or to the excavator operator if unauthorized digging is occurring over utility infrastructure.



Enterprise Decision Support System (EDSS)

Policy Optimization for Balanced Lifecycle Management (OTD)





- > GTI subsidiary to provide commercial scale implementation services for asset and integrity management technologies
- > Commercial technologies include
 - Tracking and traceability for pipes, fittings, and fusions
 - Leak survey tracking
 - Mobile applications for inspections, records, and procedures
- > Example
 - Project with PG&E to implement technology to capture material and fusion traceability data during new installations
 - High accuracy GPS, barcode scanning, and mobile GIS to create high quality records in near real-time with minimal human data entry
 - Fusion traceability to document fuser, inspector, OQ status, and fusion parameters



Utility Situational Awareness System (U.S. DHS)



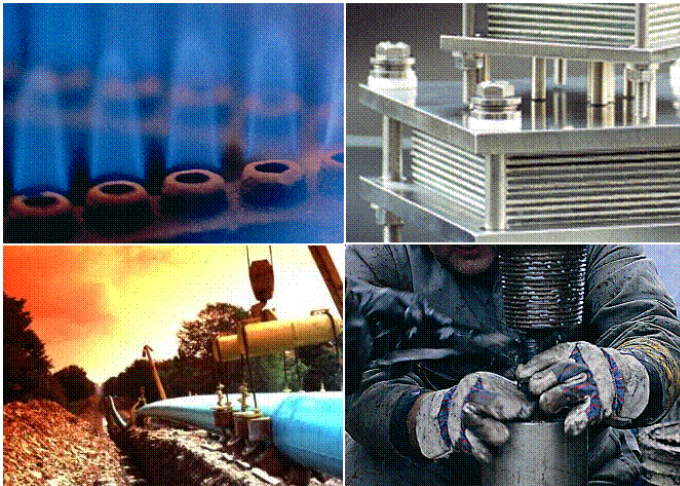
- **Objective** – Develop and deploy a data exchange methodology for critical infrastructure operators & government agencies to share information, provide situational awareness and assist with decision support during disasters.
 - Improves decision making related to threat identification, preparation, and restoration prioritization to prevent or reduce outages
 - Increases the quality and integrity of exchanged data
 - Reduces the amount of time required to exchange essential system status data
- **Focus** – A software system that provides the ability to assess threats and vulnerabilities, understand interdependencies and cascading effects, and hasten recovery
- **Video** – Explains the systems status and capabilities to potential users
<https://www.dropbox.com/s/8g4zx6ar7j8czeu/gti-USAS-v2.mp4?dl=0>

Cybersecurity Program (U.S. DHS / OTD)



- **Objective** – Develop and delivery a program to address the short and long range needs for cybersecurity capability improvement and raise awareness and streamline implementation of cybersecurity safety and attack prevention and mitigation practices with LDCs
 - Addresses highest priorities from needs identification workshop
 - Effect positive changes in attitude, practices and operations
 - Reduce risk and exposure to threats and malicious activity
- **Focus** – A series of cybersecurity technical needs improvement projects conducted in collaboration with DHS

**GTI is a company that solves important energy changes,
a company that truly has...**



...“the Energy to Lead”



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