



PHMSA RESEARCH & TECHNICAL PERSPECTIVES



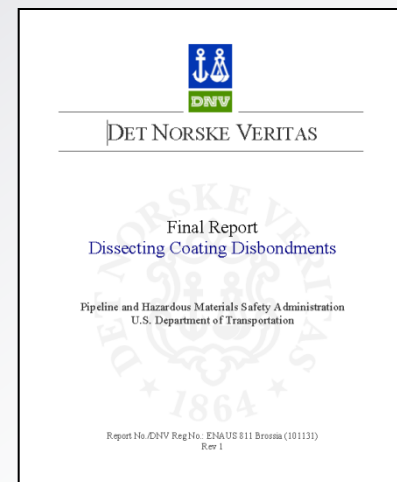
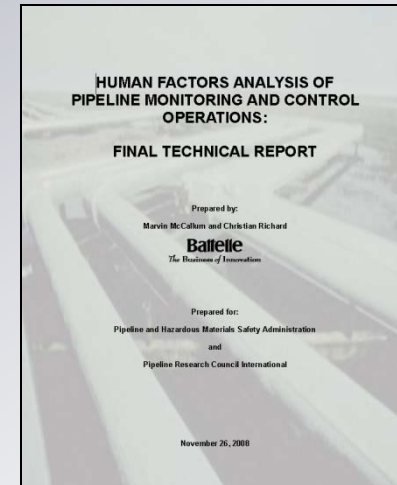
Working Group 1 – Threat Prevention
Gov/Industry Pipeline R&D Forum

July 18, 2012



Threat Prevention Research

- Stakeholder input sought/generated for Threat Prevention research at 4 Pipeline R&D Forums
- Solicited for related topics in 8 research solicitations including coatings since 2002
 - However not all solicited topics successful in becoming new research
- Related Investment: 28 technology development, product development and process improvement projects using \$7.1M (PHMSA)





Broad Agency Announcement #7

Threat Prevention 11/09

Damage to pipe by excavation, during construction or by outside force continues to be a leading cause of pipeline failure. Preventing or reducing such damage to pipelines would dramatically improve pipeline safety. Topics of interest identified as:

- Topic 1 – Technology Development – Early Warning Damage Prevention Monitoring Systems
- Topic 2 – General Knowledge – Advanced Risk Assessment Tools for Distribution Integrity Management
- Topic 3 – Technology Development – Pipe Location Detection for Metallic and Non-Metallic Materials

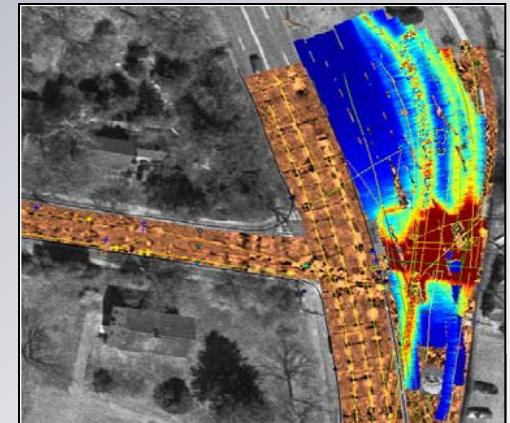
<https://primis.phmsa.dot.gov/matrix/RfpInfo.rdm?rfp=28>



Notable Outputs/Impacts



Successful deployment of digging triggers on backhoes & integration into the VA Pilot Program



gti.
the Energy to Lead

FINAL REPORT
GTI PROJECT NUMBER 20086

Plastic Pipe Failure, Risk, and Threat Analysis
DOT Project# 194
Contract Number: DTPH56-06-T-0004

Reporting Period:
May 1, 2008 through January 31, 2009

Report Issued:
March 31, 2009

Revised:
April 29, 2009

Revision No.:
01

Prepared For:
Ms. Terri Brown
Senior Engineer
PHMSA
713-272-2625
Terri.J.Brown@dkt.gov

Prepared By:
Gas Technology Institute
Ms. Julie M. Kuysh
Dr. Michael Mansour

Gas Technology Institute
1700 S. Mount Pleasant
Deer Park, Illinois 60015
www.gas-technology.org

General knowledge documenting threats to plastic pipe

Commercial improvements to ground probing radar for sub-surface mapping



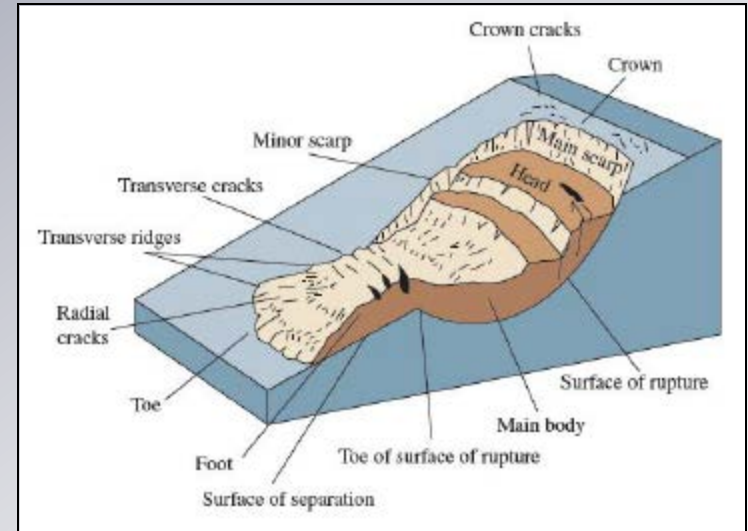
Notable Outputs/Impacts



General knowledge on the effectiveness of back fill methods



General knowledge on the effectiveness of damage prevention methods



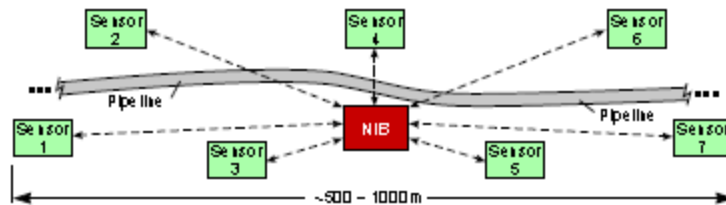
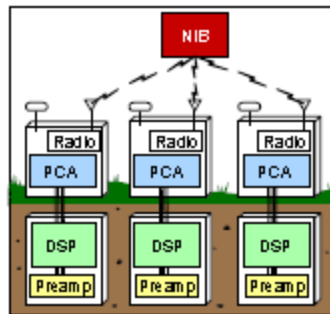
General knowledge on preventing threats from ground movements



Current Research

Developing Technology

PIGPEN is an autonomous real-time intruder warning system that detects and reports right-of-way encroachment and excavation activity near a pipeline enabling response in time *to prevent pipeline damage*. It comprises an underground network of discrete and unattended, smart sensor packages deployed around (but not in contact with) an underground pipeline or similar protected area.



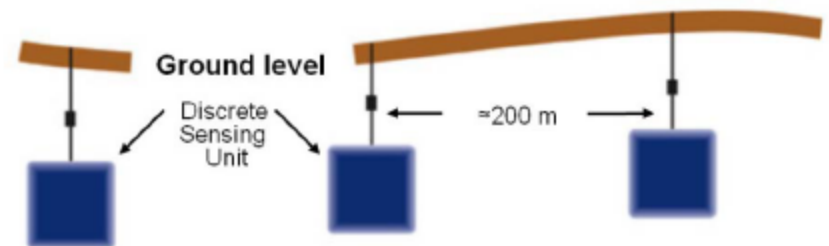
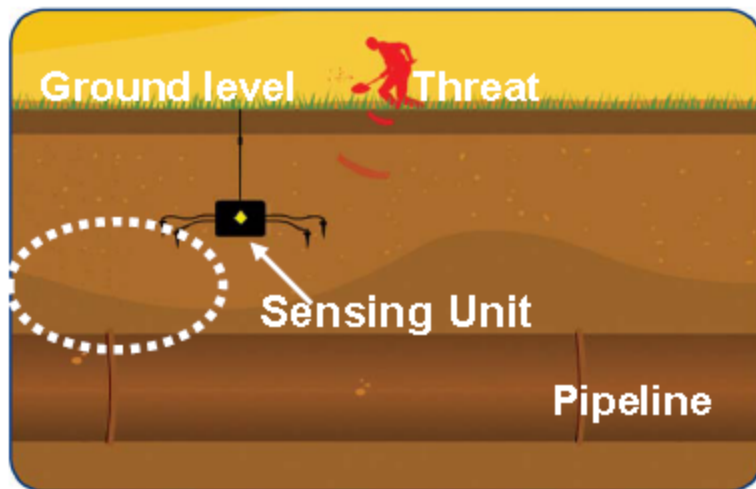
PSE&G Woodbridge NJ Pipeline

	Status	Goal
Probability of detecting threat within protected area	86%	>95%
False alarms	<7% for threats slightly outside protected area 0% for non-threats	0%



Current Research

The objective is to transform the PipeGuard™ technology from a general purpose seismic sensor into an operational tool for gas utility operators. The new platform will provide early warning alarms of excavating activity via wireless communications for short length pipeline sections. The system will be managed remotely, including use by mobile operators with wireless devices. Installation will allow for permanent and semi-permanent options.





Threat Prevention Research

Status	Contractor	Project Title
Closed	Witten Technologies, Inc.	Digital Mapping of Buried Pipelines with a Dual Array System
Closed	Gas Technology Institute	Pipeline Damage Prevention Through the Use of Locatable Magnetic Plastic Pipe and a Universal Locator
Cancelled	Electricore, Inc.	Use of Unmanned Air Vehicle (UAV) for Pipeline Surveillance to Improve Safety and Lower Cost
Closed	Northeast Gas Association	Infrasonic frequency seismic sensor system for preventing third party damage to gas pipelines
Closed	PRCI	Pipeline Integrity Management for Ground Movement Hazards
Closed	University of Alberta	Achieving Maximum Crack Remediation Effect from Optimized Hydrotesting
Closed	Gas Technology Institute	GPS-Based Excavation Encroachment Notification
Active	Northeast Gas Association	Advanced Development of Proactive Infrasonic Gas Pipeline Evaluation Network
Active	Northeast Gas Association	Advanced Development of PipeGuard Proactive Pipeline Damage Prevention System
Active	Physical Sciences Inc.	Advanced Learning Algorithms for the Proactive Infrasonic Pipeline Evaluation Network (PIGPEN) Pipeline Encroachment Warning System



Pipeline Safety R&D Contacts

Jeff Gilliam

Department of Transportation
Pipeline & Hazardous Materials Safety Administration
Office of Pipeline Safety
P(202) 366-0568
Email jeffery.gilliam@dot.gov

Jim Merritt

Department of Transportation
Pipeline & Hazardous Materials Safety Administration
Office of Pipeline Safety
P(303) 683-3117
Email james.merritt@dot.gov

Robert Smith

Department of Transportation
Pipeline & Hazardous Materials Safety Administration
Office of Pipeline Safety
P(919) 238-4759
Email robert.w.smith@dot.gov

Max Kieba

Department of Transportation
Pipeline & Hazardous Materials Safety Administration
Office of Pipeline Safety
P(202) 493-0595
Email max.kieba@dot.gov

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