



Pipeline and Hazardous Materials Safety Administration
Office of Pipeline Safety

Ben Kendrick – General Engineer/SBIR Program Manager
Overview of PHMSA R&D Tech Transfer



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

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PHMSA: Your Safety is Our Mission



Performance History Since 2002

Technology

Category	Technology Projects	Technology Demonstrations	Patent Applications (U.S. + Other)	Patents Granted (U.S. + Other)	Tech-Transfer/ Commercialized Technologies	PHMSA (\$M)	Cost Share (\$M)
Threat Prevention	29	18	4	3	6	\$14.6M	\$13.54M
Leak Detection	18	12	2	1	6	\$ 9.77M	\$ 7.41M
Anomaly Detection	44	34	24	14	17	\$30.28M	\$30.87M
Anomaly Characterization	9	3	0	0	1	\$ 4.32M	\$ 2.80M
Anomaly Repair	1	0	0	0	0	\$ 0.99M	\$0.00M
Pipe Remediation/ Rehabilitation	1	0	0	0	0	\$ 0.91M	\$0.91M
Materials	9	1	2	2	1	\$10.84M	\$ 7.91M
Welding/Joining	10	7	1	1	2	\$6.27M	\$7.48M
Alternative Fuels	3	2	1	1	2	\$1.09M	\$0.56M
Underground Natural Gas Storage	3	1	0	0	0	\$1.99M	\$0.99M
Totals:	125	77	34	22	35	\$81.13M	\$72.51M

Data as of 10/18/2023



Research Technology Transfer

Project Title: Electro Magnetic Acoustic Transducer (EMAT) Sensor for Small Diameter and Unpiggable Pipes; Prototype and Testing

Researcher: Operations Technology Development

Project Cost: \$2,158,190 (\$1,070,690 PHMSA Funding + \$1,087,500)

Public Page: <https://primis.phmsa.dot.gov/matrix/PrjHome.rdm?prj=653>

Project Main Objective: To build a field-ready EMAT sensor prototype and perform controlled field tests to assess its performance requirements and capabilities in identifying and characterizing pipe defects. The field-ready prototype will be designed for 8” diameter pipes.

Net Improvement: The project developed and then demonstrated the ability of the EMAT crack tool to detect tight/closed cracks down to 2MM deep for 8” diameter pipes in traditionally difficult to inspect pipelines. The Intellectual Property from this research and from the prior research project under PHMSA contract # DTPH56-13-T-000007 evolved into a free-swimming tool that operates at 2 m/s, navigates 1.5 diameter bends, and can be pressurized to 2,200 psi. The EMAT Crack In Line Inspection tool is now being offered by Baker Hughes/Qi2 Elements.



Pull testing performed by Q-Inline at testing facilities in Texas

Picture courtesy:
Operations Technology Development



Picture courtesy: Baker Hughes/Qi2 Elements



Research Technology Transfer

Project Title: Improved Tools to Locate Buried Pipelines in a Congested Underground

Researcher: Gas Technology Institute

Project Cost: \$1,002,000 (\$502,000 PHMSA Funding + \$500,000)

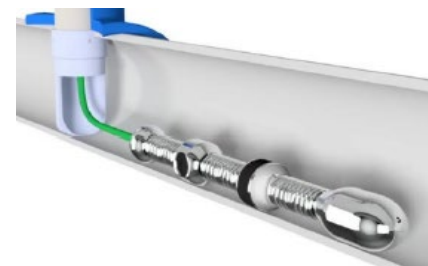
Public Page: <https://primis.phmsa.dot.gov/matrix/prjhome.rdm?prj=734>

Project Main Objective: To mitigate third-party pipeline damage at the earliest stages through the development and commercialization of a geospatial probe to map existing buried utilities through insertion into live gas pipelines. This probe will be capable of mapping live underground pipes 3-dimensionally and provide accurate locations of utilities.

Net Improvement: The project developed and validated a geospatial probe to map existing buried utilities through insertion into live gas pipelines. The resulting technology transfer led to the Live Gas Mapper (LGM-2) tool by REDUCT. The LGM-2 can map buried live gas pipes with an Internal Diameter range of 50mm up to 100mm (2" to 4"). From a single hot tap entry point it can map a gas pipe up to 300 meters/1,000' length in each direction, thus capturing data and the geographical location of 600 meters/2,000' of live gas pipe.



Prototype Testing of Pneumatically Driven Duct Rod Pusher Propelling Duct Rod into a Pipeline.
Picture courtesy: Gas Technology Institute.



Pictures courtesy: REDUCT

