PHMSA Research, Technical and Policy Perspectives

Working Group #4

Expanding In-Line Inspection Capabilities & Application

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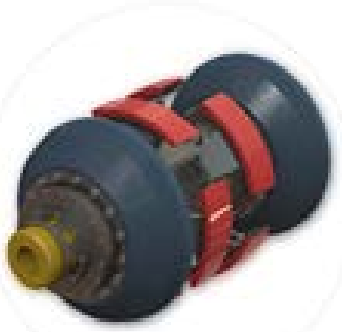
Pipeline Research and Development Forum

September 11-12, 2018

Expanding In-Line Inspection Capabilities & Application

- Program Objective: Research in this area supports technology development providing operators the most sophisticated ILI instrumentation possible for detecting anomalies in traditional and hard to inspect pipelines.
- PHMSA's Research Portfolio:
  - 29 Awarded Projects since 2002
  - $21M PHMSA + $25M Resource Sharing
  - 7 Commercialized Technologies in support of new sensors to detect corrosion and mechanical damage and robotic inspection platforms to conduct such inspections in unpiggable or hard to inspect pipelines.
  - Additional tech transfer anticipated with EMAT sensors for detecting cracks.

Notable Outputs/Impacts



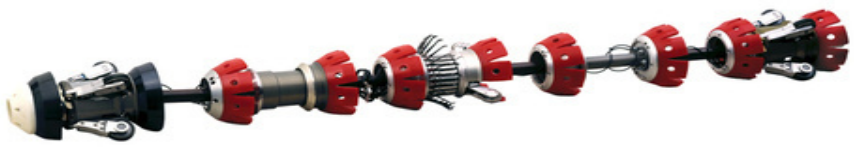
Courtesy: JENTEK

Adapted Meandering Winding Magnetometer & Magnetoresistive Arrays for ILI and characterization of pipeline damage.

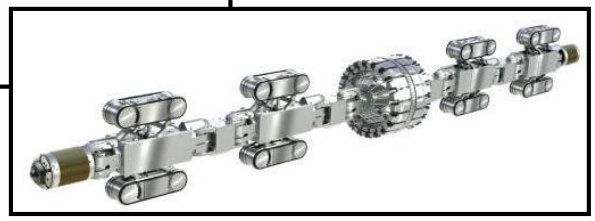
Advancements were made in the sensor configuration, instrumentation layout, mechanical integration, and data processing algorithms.

First ever In-Line Tool to map cathodic current demand

Key in finding complex corrosion defects and coating disbondments



Courtesy: Baker Hughes



Courtesy:
Pipetel Technologies

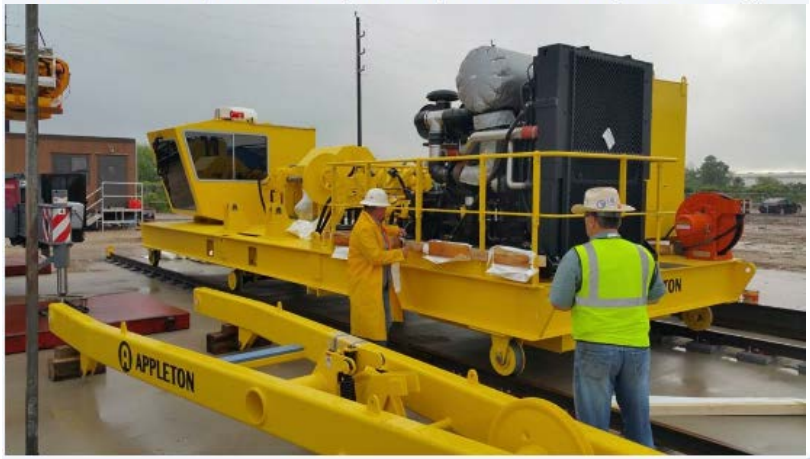
Innovative tool to inspect unpiggable natural gas pipelines

Untethered, 6”/8” & 20”/26” up to 800 psi

Technology Development Center

PHMSA supported PRCI's TDC development. Testing procedures developed and the profiling of several dozen pipe samples completed in support of effective future ILI research.

State-of-the-art pull test facility with 24, 16 and 12 inch pull test strings.

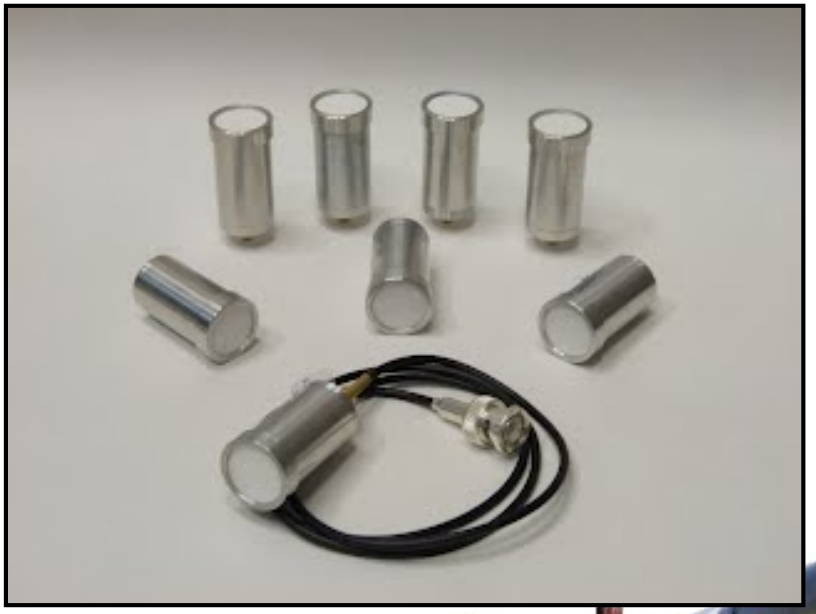


Custom built winch can pull over 5,000 lbs at a rate of 5 m/s.

Ongoing Research

Development of High Performance Gas-Coupled Ultrasonic Transducers for Inspection of Unpiggable Natural Gas Pipelines

Main Objective: This project will develop single crystal dry-coupled high efficiency ultrasonic transducers will be investigated to determine feasibility for in-line inspection in unpiggable gas pipelines. An order of magnitude improvement in system sensitivity is targeted. Accurate wall thickness data can be fed into API 579 Fitness for Service analysis, or failure criteria to allow calculation of remaining wall strength for assessment of pipeline integrity, risk assessment and materials evaluation.



Results: March 29, 2019

PHMSA: $285,963

Ongoing Research

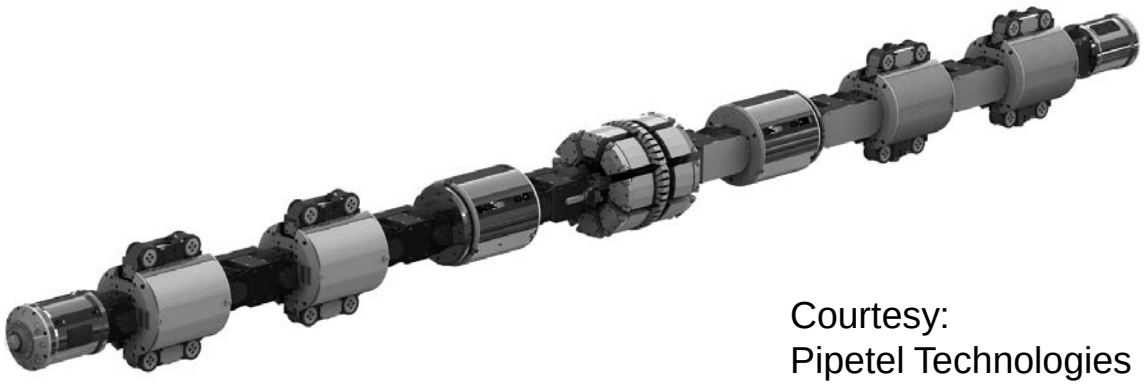
Development of an AMR Eddy Current-Based Crack Detection Sensor for the Live Inspection of UnPiggable Natural Gas Transmission Pipelines

Main Objective: This project will develop, test and commercialize an Anisotropic Magneto Resistive (AMR) Eddy Current (EC)-based sensor for live, in-line inspection of 6" - 8" diameter, unpiggable natural gas pipelines. The design is expected to be easily scalable to platforms for other pipe sizes (smaller and larger). This miniaturized sensor system has minimal power requirements.

Results: Sept 30, 2019

PHMSA: $1,073,691

Technology Transfer Anticipated!



Courtesy:
Pipetel Technologies

Thank You!/RD&T Program Contacts

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