

Quarterly Report – Public Page

Date of Report: December 21, 2016

Contract Number: DTPH5616T00003

Prepared for: U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (DOT/PHMSA)

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

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For quarterly period ending: December 31, 2016

Objective

New dry-coupled ultrasonic transducer (UT) techniques using innovative single crystals will be investigated to determine feasibility for in-line inspection in unpiggable gas pipelines, especially for wall loss measurements. This novel technology will produce more accurate, higher-temperature resistant UT probes and have additional uses in inspection for wall loss and cracks in liquid pipelines. The accurate wall thickness data can be fed into API 579 Fitness for Service (FFS) analysis, or failure criteria such as ASME B31G or RSTRENG to allow calculation of remaining wall strength. A 90% probability of detection is targeted at 800 PSIG and a two-inch standoff. These tools will contribute to assessment of pipeline integrity, risk assessment and materials evaluation. Single crystal development will be completed and they will be used to determine the feasibility of UT wall thickness measurement in a gas pipeline with no liquid couplant and reduced gas pressures within the limits of most existing pipelines.

Technical Status

The contract with GTI was placed to assist with finalizing the requirements, develop a technical advisory group (TAG), provide advice for corrosion features for later testing and report review. A review of existing crystal growth procedures and the crystal growth report milestone were completed describing a path to viable single crystal transducers.

Results and Conclusions

Improvements in crystal growth procedure have been made to solve known problems. This is early in the project so there is no publicly released information.

Plans for Future Activity

- Transducer design and modeling
- Evaluation of impedance matching coatings
- Finalize recruitment of the TAG and schedule the meeting.