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Prepared for: U.S. DOT Pipeline and Hazardous Materials Safety Administration

Project Title: Advanced Technologies and Methodology for Automated Ultrasonic Testing Systems Quantification, #261

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Progress to date:

The overall objective of the program is to reduce the uncertainty of Automated Ultrasonic Testing (AUT) detection and sizing accuracy with the goal of dramatically improving the predicted reliability of pipelines in the early design stage and will be approached in the following manner:

- Develop a methodology for quantification of AUT systems.
- Advance and quantify AUT system's image-capture capabilities.
- Quantify the performance of multiple AUT systems and establish a guidance document.
- Implement the quantification methodology in field tests and guidance document in Reliability Based Design and Assessment (RBDA) standards.

The deliverables for this program include a methodology to quantify imaging capabilities and AUT systems, probability of detection (POD) and sizing accuracy curves for multiple representative systems, guidance for AUT capabilities and ECA/strain based design approach applicability, and technical justification for modifications of the current requirements for AUT quantification trails demanded by the global practices of majors companies and codes.

The project team is being lead by EWI with cost share contributions from ConocoPhillips, Chevron, ExxonMobil, BP, Heerema, TransCanada Pipeline LTD., UTTechnology, GE Inspection Technologies, UTQuality, Mechanical Integrity, ISQ (Portugal), and Pipeline Research Council International.

The model for improved image capture capabilities has been completed. Sonainspection fabricated weld samples with implanted flaws and EWI fabricated weld samples with naturally occurring defects. The defects in the welded samples were fingerprinted using the improved AUT PA techniques. A reference library of collected data is under development. Limited open and blind trials were conducted and collected data is being analyzed. Preparations are beginning for the field trials that are scheduled for the October/November timeframe in the Canadian section of the Keystone project.