DOT 460 Quarterly Report – Public Page

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Contract Number: DTPH56-10-T-000009

Prepared for: DOT

Project Title: "MWM-Array Characterization of Mechanical Damage and Corrosion"

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Public Page Section-

This project is aimed at advancing JENTEK's MWM-Array technology to provide quantitative characterization of pipeline corrosion and mechanical damage as measured through coatings or insulation. Also of interest are higher resolution images produced with the coatings or insulation removed. For mechanical damage, quantitative characterization includes geometric variations and multidirectional residual stresses (near the surface and deeper within the pipeline). In addition, this program will develop capability to detect cracks at damage sites. For corrosion, enhanced high resolution imaging of both external and internal corrosion will be developed for specific applications to support life management decisions. The JENTEK team will build on demonstrated MWM-Array and MR-MWM-Array detection capabilities to deliver substantially enhanced characterization of damage and a practical means for implementation. This technology has been successfully applied in the aerospace and manufacturing industries and, compared to conventional NDE methods, provides substantially improved performance for imaging curved surface and buried damage through coatings.

During the fourteenth quarter of this program, we have: (1) Demonstrated an enhanced low frequency capability for internal corrosion imaging. We have performed measurements in lab on a fabricated defect sample to detect internal corrosion. We have also made adaptations to the system for improved performance. (2) Demonstrated enhanced SCC and external corrosion imaging through coatings. Based on the knowledge gained from our testing with GDF Suez on SCC crack imaging and sizing, we have performed measurements and analysis to determine the significance of the effects on the sensor response of multiple notches placed close together. (3) Completed design and development of enhanced scanners to support laboratory testing and field trials. The design of JENTEK's next generation SCC crack mapping scanner, being developed under DOT and other customer funding, has been refined to improve operator ease-of-use, as well the overall scanning mechanism. The fabrication of this scanner was completed during this period. (4) Completed a performance evaluation of characterization capability. We have performed measurements in the laboratory with the MR-MWM-Array on fabricated samples, with known defects, through varying insulation thicknesses. We are also in discussions with pipeline operators to start field trials of our SCC crack depth tool. (5) Continued development of a transition plan. We have continued internal discussions on transition planning. We have also been in discussions with several oil majors as well as service providers to develop near-term plans for transition of our technology for commercial use.

The point of contact for this program is Todd Dunford (Email: todd.dunford@jenteksensors.com; Phone: 781-373-9742).

General Information required on all Public Quarterly Reports

Results and Conclusions:

This section summarizes progress made in this program. This project is aimed at advancing JENTEK's MWM-Array technology to provide quantitative characterization of corrosion and mechanical damage to pipelines.

Progress has been made in a number of areas:

- Enhanced low frequency capability for internal corrosion imaging – Lab demonstrations – Performed measurements on a fabricated defect sample to detect internal corrosion and made adaptations to the systems to improve performance.
- Demonstrate enhanced SCC and external corrosion imaging through coatings – Laboratory demonstration and analysis – Performed measurements on pipe sections with EDM notches of various lengths, depths, and proximities to determine the significance of the effects on the sensor response of multiple notches placed close together.
- Enhanced capability scanner development – Completed fabrication of JENTEK's next generation SCC crack mapping scanner, being developed under DOT and other customer funding.
- Performance evaluation of characterization capability – Performed measurements in the laboratory with the MR-MWM-Array on fabricated samples, with known defect sizes, through varying insulation thicknesses. We are also in discussions with pipeline operators to start field trials of our SCC crack depth tool.
- Development of a transition plan – Continued development of a transition plan for our low frequency MR-MWM-Array capability for corrosion detection and characterization for field services by service providers. We are also in discussions with pipeline operators to start field demonstrations of our SCC crack depth tool.

Planned Future Activities:

N/A