

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 thirteenth quarter of this program, we have: (1) Continued development of an enhanced low frequency capability for internal corrosion imaging. We have continued to perform measurements on thicker pipe samples for detection of internal corrosion and have made adaptations to the systems to improve performance. (2) Initiated demonstration of enhanced SCC and external corrosion imaging through coatings. We recently completed a successful capability demonstration with GDF-Suez for SCC crack imaging and depth estimation during cyclic fatigue. JENTEK was able to provide preliminary depth estimates to the GDF-Suez project team during cyclic fatiguing to enable controlled crack propagation in a SCC cluster. (3) Continued 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, is being refined to improve operator ease-of-use, as well the overall scanning mechanism. (4) Continued performance evaluation of characterization capability. We have continued 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 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 – Performance evaluation and field demonstrations – Performed measurements on thicker pipe samples for detection of internal corrosion and made adaptations to the systems to improve performance.
- Demonstrate enhanced SCC and external corrosion imaging through coatings – Capability demonstration – Performed successful capability demonstration with GDF-Suez for SCC crack imaging and depth estimation during cyclic fatigue. JENTEK was able to provide preliminary depth estimates to the GDF-Suez project team during cyclic fatiguing to enable controlled crack propagation in a SCC cluster.
- Enhanced capability scanner development – JENTEK's next generation SCC crack mapping scanner, being developed under DOT and other customer funding, recently completed internal design reviews and is set to enter fabrication stage.
- Performance evaluation of characterization capability – Continued measurements in the laboratory with the MR-MWM-Array on fabricated samples, with known defect sizes, through varying insulation thicknesses.
- 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:

1. Complete a demonstration of an enhanced low frequency capability for internal corrosion imaging.
2. Complete a demonstration of an enhanced SCC and external corrosion imaging through coatings.
3. Complete development of enhanced field deployable scanners and equipment.
4. Complete performance evaluation of characterization capability.
5. Complete development of a transition plan.