

DOT 460 Quarterly Report – Public Page

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Prepared for: DOT

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

Prepared by: JENTEK Sensors, Inc.

Contact Information: Todd Dunford, todd.dunford@jenteksensors.com, 781-577-2315

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Public Page Section-

This project is aimed at advancing the JENTEK MWM-Array technology to provide quantitative characterization of corrosion and mechanical damage. This includes characterization through coatings/insulation; followed by higher resolution imaging with coatings/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. This team will build on demonstrated MWM-Array (and MR-MWM-Array) detection capabilities to deliver substantially enhanced characterization of damage and practical means for implementation. This technology has been successfully applied in the aerospace and manufacturing industries and provides substantially improved performance for imaging surface and buried damage through coatings and for curved surfaces compared to conventional NDE methods.

During the tenth quarter of this program, we have: (1) Initiated preparation for an enhanced capability demonstration of mechanical damage imaging. JENTEK has initiated adaptation of calibration and measurement procedures. We have also started discussions with PRCI and other industry partners regarding access to samples and site of the demonstration; (2) Initiated development of an enhanced low frequency capability for internal corrosion imaging. Under a combination of JENTEK IR&D, other customer and DOT funding, JENTEK has completed the design of the new revision of the GridStation 8200 printed circuit boards. The boards have been fabricated and testing is complete. A pre-production prototype system (GridStation 8200a) is currently being fabricated and is on schedule for initial field testing in May, 2013; (3) Demonstrated preliminary inspection capability for ferrous and non-ferrous welds. JENTEK performed preliminary capability demonstration of JENTEK’s MWM-Array technology for imaging and characterization of mechanical damage, near and away from welds, on laboratory mechanical damage pipeline sections. We have also continued discussion with pipeline operators and oil majors to refine the problem definition; and (4) Continued design and development of enhanced scanners to support laboratory testing and field trials. Under DOT and other customer funding, JENTEK has initiated fabrication of its next generation prototype field deployable CUI (external corrosion) and through wall (internal corrosion) scanner to support upcoming field trials at oil major facilities.

The point of contact for this program is Todd Dunford (Email: todd.dunford@jenteksensors.com; Phone: 781-577-2315).

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 the JENTEK MWM-Array technology to provide quantitative characterization of corrosion and mechanical damage.

Progress has been made in a number of areas:

- Enhanced Mechanical Damage Imaging – Demonstration Preparation – Initiated preparation for an enhanced capability demonstration of mechanical damage imaging. JENTEK has initiated adaptation of the enhanced calibration and measurement procedures, as well as adaptation of our next generation prototype mechanical damage imaging scanner for the mechanical damage application. We have also started discussions with PRCI and other industry partners regarding access to samples and site of the demonstration
- Low frequency internal corrosion imaging capability – Under a combination of JENTEK IR&D funding other customer funding and DOT funding, JENTEK has completed the design of the new revision of the GridStation 8200 printed circuit boards. The boards have been fabricated and testing is complete. A pre-production prototype system (GridStation 8200 α) is currently being fabricated and is on schedule for initial field testing under several programs in May, 2013. This system will then be available to support testing under this program.
- Enhanced capability scanner development –Under a combination of DOT and other customer funding, JENTEK has initiated fabrication of its next generation prototype field deployable CUI (external corrosion) and through wall (internal corrosion) scanner to support upcoming field trials at oil major facilities.
- Demonstration Measurements – Welds – Performed demonstration of JENTEK’s MWM-Array technology for imaging and characterization of mechanical damage, near and away from welds, on laboratory mechanical damage pipeline sections. Several mechanical damage pipe samples – containing dents of different dimensions as well as dents with cracks, on or near welds – were made available to JENTEK by a pipeline operator. Analysis of data is ongoing.

Plans for Future Activity:

1. Continue preparation for enhanced capability demonstration of mechanical damage imaging.
2. Continue adaptation of measurement procedure to demonstrate enhanced SCC and external corrosion imaging through coatings.
3. Continue development of enhanced low frequency capability for internal corrosion imaging.
4. Continue the design and development of enhanced field deployable scanners and equipment.
5. Develop interim performance evaluation of characterization capability.