

QUARTERLY REPORT

DOT Project No.: 727

Contract Number: 693JK31810001

Improvements to Pipeline Assessment Methods and Models to Reduce Variance

Reporting Period:

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Report Issued:

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Prepared for:

U.S. Department of Transportation Pipeline and Hazardous
Materials Safety Administration

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Executive Summary

DOT contract 693JK3181000, Project 727, Improvements to Pipeline Assessment Methods and Models to Reduce Variance was contracted at the beginning of August 2018. The official kickoff call was held on October 10th, 2018.

GTI started putting the sub-contracts with Arizona State University and Michigan State University in place immediately after the GTI contract was executed. Both contracts are now fully executed, and the universities have submitted their first quarterly reports on Uncertainty Reduction and The FEM Simulation of NDE Signal Responses. GTI has acquired and setup the hardware environment for the structural FEM analyses, acquired the modeling server licenses for COMSOL and is progressing well on the shakedown of the FEM and damage propagation models. GTI has completed the tensile and toughness testing planned for this project and has calibrated the constitutive models for several pipeline steels. GTI is currently working on resolving convergence issues for the damage propagation models but is ahead of schedule on this task that is scheduled for the second quarter. GTI is also well ahead of schedule on the shakedown of the server environment scheduled for second quarter but will be complete early November 2018.

Table 1 lists the task completion schedule as defined in Attachment 5 of the contract. Fourteen (14) out of the fifteen (15) (93%) scheduled milestones are complete, and one milestone scheduled for second quarter was completed in the first quarter putting the project 100% on track for task work. The incomplete first quarter milestone will be completed second quarter, with no anticipated issues. This milestone involves communication with all of separate teams. The requisite collaborative meetings were not scheduled in the first quarter as planned due to scheduling conflicts, not technical issues.

The project spend rate is tracking on target. The bulk of the hardware, software and material costs were absorbed inn first quarter, as planned, due to the acquisition and building of the FEM server environment and the material test costs for developing the constitutive models needed for the FEM analyses. The upcoming quarters will see much lower spends with more focus on technical work as all of the technical tasks move into high gear.

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Table 1. Task Completion Schedule

<u>Item No.</u>	<u>Task No.</u>	<u>Activity/Deliverable</u>	<u>Quarter No.</u>	<u>Expected Completion Date/Mos</u>	<u>Payable Milestone</u>	<u>Complete Yes/No</u>
1	1.1	Form Technical Advisory Panel	1	3 months	Contact panel members and distribute project information package	Yes
2	1.2	Form Technical Advisory Panel	1	3 months	Kickoff meeting webinar	Yes
3	2.1	Define Project Database and Workflows	1	3 months	Define datasets	Yes
4	2.2	Define Project Database and Workflows	1	3 months	Identify database components necessary to house and relate the datasets	Yes
5	2.3	Define Project Database and Workflows	1	3 months	Define the database system architecture	Yes
7	2.5	Define Project Database and Workflows	1	3 months	Vendor quotes confirmed for server environment	Yes
6	2.4	Define Project Database and Workflows	1	3 months	Define the data related workflows	No
8	3.1.1.1	Uncertainty Reduction	1	36 months	Uncertainty Quantification of Material Properties and Defects Phase 1 Report	Yes
9	4.1.3.1	Structural FEM Study	1	36 months	Verify vendor quotes for hardware	Yes
10	4.1.3.2	Structural FEM Study	1	36 months	Select vendor and acquire hardware and software licenses	Yes
11	4.1.3.3	Structural FEM Study	1	36 months	Build Server Environment	Yes
12	5.1.1.1	FEM Simulation of NDE Signal Responses	1	36 months	Multi-modal NDE Sensing Techniques Phase 1 Report	Yes
13	7.1.1	Full Scale Validation Testing	1	18 months	Tensile Testing Report	Yes
14	7.1.3	Full Scale Validation Testing	1	18 Months	Charpy Impact Testing Report	Yes
15	9.1.1	Project Management	1	36 Months	1st Quarterly report organizing the sub-reports for each of the tasks listed as deliverables in quarter 1, schedule and budget update..	Yes
21	7.1.2	Full Scale Validation Testing	2	18 months	Stress Triaxiality Testing Report	Yes

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