

3rd Quarterly Report

Date of Report: *May 24, 2016*

Contract Number: DTPH5615T00014

Prepared for: *DOT PHMSA*

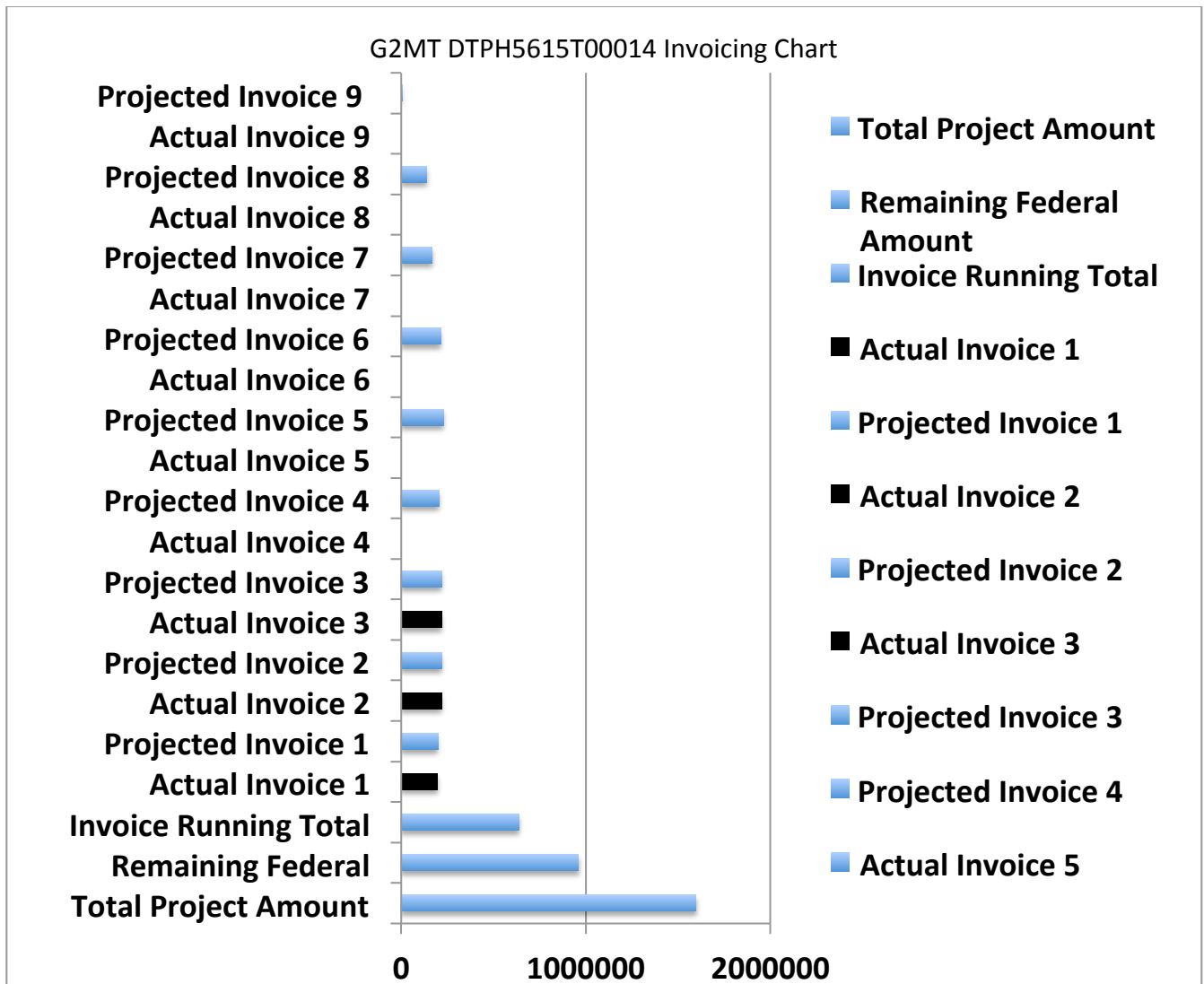
Project Title: "Use of Electromagnetic Sensors to Quantify Strength and Toughness in Steel Pipelines In and Out of Service"

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For quarterly period ending: *May 23, 2016*

Funds and Work Completed During this Quarterly Period



(a) Technical Status

The work performed during this third quarterly reporting period included Items 12 through 18 to perform Tasks 2 through 8 in Quarter 3. The tasks performed included: (1) Continued collection of vintage pipe samples from cost share partners; (2) Performing measurements on pipes in the field and laboratory and removing sections of pipe when possible to bring to G2MT for full metallurgical characterization; (3) Fully characterize all vintage pipeline specimens that have not already undergone vigorous characterization; (4) Correlate the strength and toughness of the vintage pipe section in terms of the microstructural and fracture characteristics to evaluate both the brittle and ductile fracture behavior; (5) Compare and analyze electromagnetic results and pipe metallurgical characterization results and determine the relationships between microstructure and mechanical properties, (6) Determine the sensitivity of the electromagnetic sensors to small and large variations in strength and toughness, (7) Determine which probe design is optimum for maximum sensitivity, repeatability, and ease of use for an in-ditch sensor. The same probes that are used for the in-ditch sensor can be installed onto existing "smart" pig system to gather information at rapid speeds along much longer sections of a pipeline, and (8) Develop algorithm to quantify strength and toughness in vintage pipelines.

(b) Business Status

During this reporting period, G2MT was able to finish collecting a large assortment of vintage and new pipe. The other tasks (2 through 8) for the third quarter will continue until the 12th or 15th month period, which includes a large amount of laboratory testing (microstructural, mechanical, and chemical) and analyzing all of the collected electromagnetic data to establish the relationships between the steel properties and the electromagnetic data. G2MT is now also evaluating the sensitivity of the sensors to variation in properties, as well as probe design and algorithm development.

During this third quarterly reporting period, G2MT has accomplished the third group of interim milestones and the quarterly (interim) reporting is on track according to the budgeted expenditures. The total amount of cost-sharing for this period was \$800,000. The proposed budgeting for the first interim periods was \$219,200 and the actual expenditures for each period have equaled the budgeted amounts.

(c) Payable Milestones

The invoice associated with this quarter includes the budgeted \$219,200 payable for the 3rd interim report period. The remaining funds following payment of the 3rd invoice will be sufficient to complete the proposed testing and demonstration period on or ahead of the schedule described in the project proposal.