

Quarterly Report – Public Page

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Contract Number: DTPH56-15-T-00019
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Project Title: Intrinsically Locatable Technology for Plastic Piping Systems
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Project Scope

The scope of the project will be to develop an electronic marking system that will provide locatability to the target depths on various diameter high density polyethylene (HDPE) and medium density polyethylene (MDPE) for gas applications. The project will also assess the technology capabilities versus pipe diameter, burial depth, and pipe burial methods (horizontal directional drilling, open trench, etc.). Included in the marker development will be the development of a flexible housing to allow the solution to be adaptable to a wide range of pipe diameter sizes. The attachment method will be integrated into the plastic pipe manufacturer process and workflow. Laboratory and field evaluations will be performed to validate the system to be commercially viable as an intrinsically locatable PE piping system.

In order to evaluate the various marker housing attachment methods, the project team procured various types of PE pipes and fabricate prototypes of the marker housing with magneto-mechanical resonators. These markers were then attached to the PE pipes using the various attachment concepts described above. These PE pipe sections were then installed in GTI's pipe farm via horizontal directional drilling (HDD) installation methods. The pipe was trenchlessly installed through three types of soil in the pipe farm; gravel, clay and sand based soils.

Technical Status

During the fourth quarter, the attachment method of the marker housing to the PE pipe were examined and evaluated. Several attachment methods were considered to ensure proper adhesion to the PE pipe. An evaluation of the process and attachment methods were made at this time. Maximum shear stresses and elongation will be determined during the installation process as well as during storage, handling, and pipe installation. Evaluations of the attachment to determine its effectiveness over time, in varying temperatures, and environmental conditions were performed.

Results and Conclusions:

The project is progressing well with good assessment results for the various concepts for the flexible housing to meet the pipe's bend radius, type, size and installation methods were developed. The research team has developed various attachment methods and conducted initial field tests using HDD installation methods in gravel, clay and sand soils of 1", 2", and 4" PE pipes with attached sensors.

Plans for Future Activity:

The next steps will consist of further evaluation and review of the various sensor attachment methods.

During the next quarter, the following activities will be conducted:

- Continue Task 4 efforts by evaluating pipe attach process options and fabrication with pipe manufacturer. Also, continue evaluations of the attachment to determine its effectiveness over time, in varying temperatures, and environmental conditions.
- Continue Task 5 efforts by evaluating PE pipe samples with the integrated locating system in GTI's pipe farm on GTI property using various industry practices.