

Design, Construction & Operation of a Test Bed Network

Description: An above and below ground pipeline network with engineered features for testing a variety of pipeline integrity technologies.

Status: Project is complete and facility continues to host tests and demonstrations.

BENEFITS

The NYSEARCH/NGA Test Bed is a versatile, well-calibrated and characterized pipe network that can be used to test robotic and non-robotic pipe inspection tools and train personnel on the use of DA technologies.



OPS Collaborative Guided Wave Demo

The test bed network is a multi-functional pipe network with the ability to test a number of different technologies under a variety of conditions. The facility ensures that tests are performed on pipes with defects of known quantity and at severity levels that are useful for evaluation. Excavation and restoration

costs at live field sites are avoided. Approximately \$30,000 per site is saved (based on rural field tests conducted in 2004).

Advantages of the test bed network over typical field sites are the controlled nature of the test, known conditions, and the ability to vary influences such as cathodic protection. By having one site, tests and demonstrations become more repeatable. Casings do not have to be removed to verify defects. Excavations and restorations are not made at multiple sites; and technologies can seek actual defects rather than risk testing in the absence of defects.



No-Pig Aboveground Inspection Test

BACKGROUND

The NGA Direct Assessment (DA) Working Group (an experienced group of corrosion engineers) and NYSEARCH have been active in preparing for and responding to OPS/DOT plans to increase inspection requirements for transmission lines. In its evaluation of pipe inspection technologies, NYSEARCH/NGA has sought to find technologies that can provide information about pipe wall conditions.

Participants in pipeline integrity test work have also identified a critical need to develop and test prospective and newer technologies that can assess coating integrity and quantify metal loss. As a result, NYSEARCH/NGA has chosen to fund the development of both robotic and non-robotic inspection technologies.



TIGRE Robot Testing

Since many of the technologies are still in the R & D phase of development, the need has grown for a convenient means for controlled field testing under a range of site conditions. Therefore, members of NYSEARCH and the NGA DA Working Group made a detailed plan for designing, constructing and operating a test bed network.



Magnetostrictive Sensor Testing

TECHNICAL APPROACH
 NYSEARCH/NGA has constructed a system that addresses a range of pipe diameters: 12 inch, 16 inch, and 20 inch. Three different types of pipe coatings exist on the networked segments; bare steel, coal tar enamel coated pipe, TFG-3 coal tar, and fusion bonded epoxy coated pipe. The overall length of pipe in the network is approximately 1400 feet. The network is connected with several flanges, reducers, elbows, tees, and a 20 inch plug valve.



Machined Defect



Simulated Natural Corrosion

Multiple conditions have been installed including machined and natural defects, random defects created by construction equipment, coating issues, and adjustable cathodic protection arrangements. The majority of the test bed is buried having some above and below ground cased pipe. Two vaults access the below ground cased section. Finally, points of entry and exit have been installed to facilitate the launching of robotic inspection equipment.

The test bed is located in Johnson City, NY



Robot Launch Pit

PROJECT STATUS

Since 2005, the test bed has been completed and functional. Numerous technologies have tested or demonstrated their performance. Substantial tests and demonstrations of guided wave and above ground technologies have taken place. Some robotic testing has occurred as well.

HIGHLIGHTS

- Capable of testing a variety of inspection technologies and other pipeline innovations
- Capable of testing technologies for cased crossings

FOR ADDITIONAL INFORMATION

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