Northeast GAS ASSOCIATION

NYSEARCH

Technology Brief

Testing Program for Remote Inspection using Magnetic Tomography

Description: An evaluation of the magnetic tomography method through standardized testing; could result in recommendation for approval as an alternative DA inspection technique.

Status: Project is initiated. Field testing is early project focus.

BENEFITS

Transkor's magnetic tomography method (MTM) is a non-intrusive and non-contact technology which provides aboveground inspections without imparting a signal onto the pipeline. This provides flexibility during an inspection by avoiding the need for an electrical connection to the pipeline.

The Simplicity of an MTM Survey

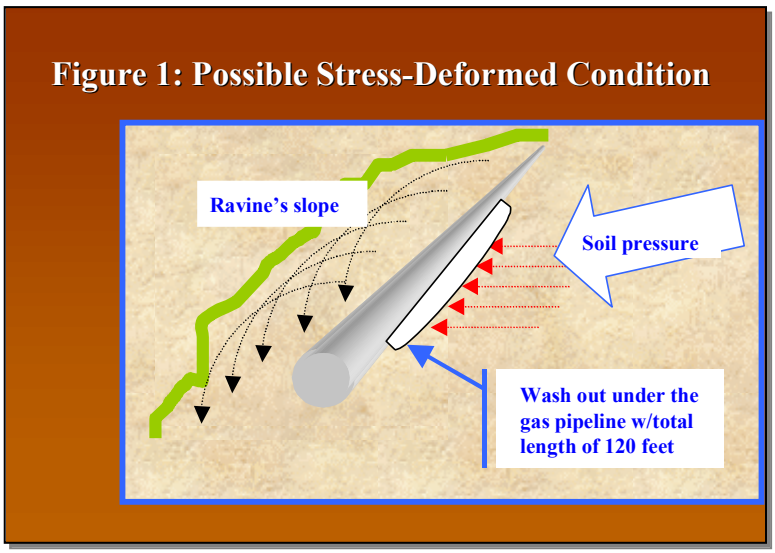
This program will validate the capabilities of MTM. If results are positive, and support from pipeline operators is evident, NYSEARCH will work with regulators towards approving the technology as an "other technology" for pipeline integrity inspection.

The overall benefit of this study will help operators meet ECDA or ICDA requirements under the rules of the Office of Pipeline Safety (OPS) now known as PHMSA.

BACKGROUND

As written in the integrity management plan (IMP) rules, all transmission line segments in high consequence areas are required to be assessed by in line inspection, pressure testing, direct assessment or 'other technology'. For a number of years, NYSEARCH/NGA and previously, NYGAS, have been working to find a remote inspection technology that can determine active corrosion that resulted in metal loss. Previous investments include development of a remote sensing corrosion detector with Johns Hopkins University and development of a pipeline current mapper and stray current mapper with Radiodetection. During the 1990s when this work was going on, one of the technological barriers for these electromagnetic techniques was the fact that active corrosion could not be predicted on COATED pipes.

The Transkor technology is different from earlier techniques in that it uses a passive magnetic measurement (a signal is not introduced into the pipe). The techniques described earlier used active magnetic signal



generation. This technology focuses on mechanical stress concentrators and is intended to detect a range of anomalies on coated or bare pipe. If successful in a sufficient number of applications, this technology could be a breakthrough that has been sought for years.

This method of Magnetic Tomography (MTM) has been developed by Transkor-K of Russia and has been the subject of pipeline testing in Eastern Europe. Applications for commercial service jobs to date are gas pipelines, oil pipelines and limited work on water pipelines.

TECHNICAL APPROACH

The MTM method identifies and analyzes magnetic field anomalies in areas with stress concentrators resulting from defects or changes in structural conditions and excessive mechanical stress or a combination thereof. Figure (1) illustrates possible earth related pipe damage caused by erosion, seismic activity, or third party damage.

The MTM signal processing techniques have not been described by Transkor. The company considers its' algorithms proprietary and is taking a "black box" approach in offering and developing this technology.

The project will evaluate the Transkor technology through a formalized and standardized process that incorporates tests from multiple utilities. Transkor will perform tests on (5) pipeline segments that consist of (2) to (5) km lengths from the NYSEARCH membership. Transkor will develop a preliminary report after each test, followed by up to (3) "calibration digs" on each pipe. The calibration digs will allow Transkor to develop an accurate final report. The findings in the final report will be evaluated based on verification digs at (5) predictions.

PROJECT STATUS

Currently, NYSEARCH is working with funding utilities to seek five host pipelines for testing. City and rural sites have been tested in New York State; other sites have been scheduled in Canada.

MTM Field Testing Through Asphalt & During Wet Conditions

TECHNOLOGY POTENTIAL

- Inspect without electrical connections to the pipe
- Detect anomalies through coatings
- Potentially meet ECDA or ICDA

FOR ADDITIONAL INFORMATION

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