Achieving Multi-Sensor Inspection (MSI) for Watermains and Forcemains

Presenter: Gordon Henrich, Pressure Pipe Technical Consultant, Ontario Main Rehab

ABSTRACT

A decade ago, inspection technology for gravity sewer pipes was developed and combined to provide multi-sensor inspections that included CCTV, Sonar, Laser, distance, temperature and gas readings. Simultaneous synchronized data collection has become the norm in gravity sewer pipes 900mm and up capitalizing on the "one time deployment" attitude that reduces costs of multiple mobilizations and deployments.

For the pressure pipe market, this concept of combining inspection technology has taken longer because of challenges with the system configuration, access requirements, and the inability to shut down a system to insert inspection technology. The existing standalone technology includes CCTV or Video, acoustic leak detection, pressure monitors, and highly sophisticated technology for pipe wall condition assessments. Tethered (or not) has also been a consideration based on historical inspection events, necessitating tracking systems to locate and verify autonomous equipment movements along a pipeline.

Two technologies have emerged in the past year on the North American market that are truly cost effective by combining various data points for condition assessment collected at the same time.

Electroscan has introduced their truck mounted tethered version of MSI for pressure pipes. They employ a low voltage conductivity sensor to measure individual leaks, HD CCTV Camera, a pressure sensor to provide location-specific water pressures, and an acoustic sensor – To record sound vibrations and provide a benchmark of legacy results that can be readily compared to low voltage conductivity results.

PITA has introduced the MTA Pipe-Inspector which is an autonomous version of MSI for pressure pipe. The Pipe-Inspector is battery powered and untethered allowing it to be transported with the existing fluid. Unlike tethered systems where inspection lengths are limited, Pipe-Inspector is capable of deployments many kilometers in length. MSI features include Optical video inspection with LED in high definition, Acoustic leak detection with pinpoint accuracy, pressure recording along the entire pipe length, turbidity measurement, conductivity measurement, temperature measurement, and length measurement with footage display.

With MSI now available, municipalities can budget and plan for a triage style of condition assessments, assigning degrees of urgency to complete repairs to mitigate water loss or conduct more expensive pipe wall condition assessments, like stopping the bleeding prior to treating a broken bone.

This presentation will present a balanced overview of MSI technologies and t heir application to pressure pipe inspections.

Note:

Gordon Henrich, owner of Pipeline Integrity Technology Associates (PITA), supplies MTA Pipe-inspector technology to service providers throughout North America and works with Ontario Main Rehab (OMR) in Eastern Canada providing hands on service. Gord spent 4 years with PPIC in Ontario and has extensive experience with RFEC technology, as well as technologies provided by PURE.