



CYPRESS

In-Line Inspection

Challenge:

- Assess and locate anomalies in 72" coal tar lined steel pipeline

Solution:

- Run a **EcoVision™** XHR MFL ILI tool specification capable of detecting major features

Result:

Successful in-line inspection of a 72" x 1,800 feet water pipeline and the accurate location of anomalies in each line.



CASE STUDY

City of Denver 72" Coal Tar Lined Potable Water Aqueduct

Extra-High Resolution Magnetic Flux Leakage (MFL) In-Line Inspection of Mortar-line Steel Aqueduct for Denver Water

Background

Cypress In-Line Inspection, LLC ("Cypress") and its predecessors have been inspecting large diameter pipelines for approximately eighteen years. Denver Water has a long-term pipeline integrity program to inspect its large diameter water delivery pipelines. The Denver Water pipeline system delivers approximately 50 million gallons of water per day to approximately 1.5 million people in the Denver metro Area. Denver Water understands the criticality of keeping the water systems operating safely. The costs/benefit of a long-term pipeline integrity management program are very attractive relative to the alternative of unplanned outages. Cypress ILI's **EcoVision™** Extra-High Resolution MFL tool underwent pre-run procedures in Cypress ILI's facility in Salt Lake City.

The ILI crew arrived on site on time and conducted tailgate and JSA talks to have all working parties (customer crew, construction crew, safety crew and ILI team) in sync with the day's ILI activities. Denver Water had previously removed a 100-foot section of pipe, giving Cypress a full bore opening to insert the Electric Tow Vehicles (ETV) and the MFL tool completely assembled. Usually the ETVs and MFL tool are built inside the pipeline by lowering sections through a manhole at the starting point of the inspection.

The Problem

During the walk through of the pipeline prior to the inspection, Cypress ILI personnel noted that the pipe appeared to be oblate, wider side to side than top to bottom. If a pipeline has been deformed over time, the MFL tool has a more difficult time moving through the line. Additionally, the pipeline had a biofilm on the pipe surface which reduced traction of the ETVs significantly during the inspection process. The MFL is designed with collapsable magnetic sections allowing it to move through varying changes in the diameter of the pipe including changes in the shape of the pipe. However, in this case, the combination of height-to-width disparity and poor ETV traction caused the tool to become stuck at a welded joint.



Work area showing the opening where the tool was inserted into the pipeline.



Weather was a problem at times.



The biofilm, which caused traction problems, was scraped off of the wall and collected on the tool. The collected material is shown on a support spring. The biofilm does not affect the inspection data.

The Solution

With the tool stuck at the weld, the field crew contacted Cypress ILI's mechanical engineer in Salt Lake City to discuss a solution. It was determined that the best approach to complete the inspection was to remove one section from the tool and collapse the remaining sections to create a smaller version of the tool. The field crew successfully executed this adjustment in under two working days.

The inspection resumed from the point where the MFL had been stuck, but the biofilm on the pipe surface continued to hinder traction for the ETVs. Despite this challenge, the field crew persevered and completed the inspection. Upon completion, the tool and the ETVs were extracted from the pipeline by disassembling it into smaller sections and passing the sections through a side mounted manhole.

Project Conclusions

An ILI tool's ability to exceed expectations is invaluable to pipeline inspection operations. A rugged design and a robust data sampling rate provide customers with an added cushion when unforeseen circumstances prevent ideal operating conditions. Cypress ILI's **EcoVision™** MFL ILI tool systems deliver best-in-class performance for integrity programs while also offering impressive capabilities and specifications, making them a valuable asset for municipal water agencies. Adhering to the ILI execution process and procedures at all times is crucial for consistency. When combined with a high-performance ILI tool system, this approach creates a formula for success—ensuring reliability, accuracy, and continuous enhancement of any Integrity Management Program.