



CYPRESS
In-Line Inspection



North Jersey District Water Supply Commission

CASE STUDY

Challenge:

- Assess and locate anomalies with the potential to reduce operating pressures within asset lifecycle criteria
- Mortar liner repairs needed to be completed before inspection of the steel pipe could be completed
- First time Cypress ILI inspected lock-bar steel pipe line

Solution:

- Run the Cypress ILI Municipal Water Geometry and XHR-Magnetic Flux Leakage tools

Result:

- Successful in-line inspection of the 1.1 mile potable water pipeline and the accurate location of anomalies.

Cypress In-Line Inspection North Jersey Wanaqua Aqueduct

Extra-High Resolution MFL In-Line Inspection of a finished water aqueduct mortar lined steel pipe with Lock-bar long seams

Background

Cypress ILI was called upon to provide a Extra-high Resolution inspection of a steel aqueduct which is approaching 100 years since being built and put into service. The aqueduct is rarely taken out of service. The client, North Jersey Water District Supply Commission, wanted to perform a comprehensive evaluation of the line's condition. Previously, North Jersey would inspect the line visually. This visual inspection would only occur if they took the line out of service and could enter the line or if they had a problem and they had to excavate the line. The visual inspections did not give a comprehensive view of the length of the line.

The Problems with the pipeline

North Jersey wanted a comprehensive evaluation of their aqueduct to determine if there are problems which would require North Jersey to make immediate repairs to the steel pipeline. North Jersey also wanted to check the pipeline to ensure that it was free from dents, bulges, ovality problems or any other anomaly in the circumference of the steel pipe.

The line uses "Lock Bar" system to make the long seam closure on each of the pipe sections used to build the full length of the line. The Lock Bar system uses a piece of steel shaped similar to an I-beam. The Lock Bar piece is placed between two pipe sections and then the Lock Bar is pressed closed over the pipe to make a seal. Because the Lock Bar adds metal around the seams it absorbs more of the magnetic field causing a loss of magnetic field. Cypress did a magnetic field simulation of this area which showed that the magnetic field would be too low for inspection purposes about 12-inches on both sides of the Lock Bar.

Cypress and North Jersey discussed the loss of data and North Jersey determined that the knowledge gained by inspecting the pipe wall where the magnetic field wouldn't be affected by the Lock Bar was acceptable. North Jersey agreed to conduct the inspection even with the loss of the magnetic field around the Lock Bar.





Solution

The project commenced with a site visit by Cypress personnel to gather additional information not included in the 'as-built' lay sheets. During the visit, the team conducted a walkthrough of the pipeline to examine the liner before the inspection. If any damage was detected, repairs could be made prior to the inspection process. The liner needed extensive repairs prior to the inspection. North Jersey completed the necessary repairs on the liner and gave the green light for the project.

Following the site visit, Cypress personnel prepared the MFL tool for use in the 72" pipe. This process involved calibrating the sensors to account for the pipe's diameter, the thickness of the mortar lining, and the steel wall including the lock bar. Cypress performed the geometry inspection. After completing the geometry the tool's frame was reconfigured to the MFL inspection tool. Cypress' team then successfully completed the MFL inspection.

At the end of each day's inspection the data was downloaded from the tool to a laptop. The data was then uploaded to Cypress' server in Salt Lake City. The next day Cypress' data analysts would begin the process of reviewing the data. The MFL tool successfully completed the inspections and high quality data was obtained. The data was analyzed and all defects were identified.

Project Conclusions

The project was successfully completed and Cypress was able to identify and accurately locate defects in the line. As part of the findings, Cypress determined that the area around the lock bar seam, which was affected by the larger steel of the bar, was smaller than Cypress thought it would be based on the magnetic simulation. The area affected was only six –inches instead of twelve-inches. Because the affected area was narrower than expected the results were better than expected and gave North Jersey a better understanding of their pipeline.

