

Case Study

Mechanical Cleaning and Ultrasonic Inline Inspection of Brine Pipelines

Introduction

Intero delivered a turnkey solution to clean and inspect 2 brine saltwater pipelines in the USA. The client faced uncertainty due to minimal pipeline records and a lack of previous pigging history. Despite these challenges, Intero successfully completed the project within a narrow shutdown window, providing high quality inspection data and enabling the client to proactively manage integrity risks.

The Challenge

The client needed a comprehensive solution to clean and inspect their brine pipelines under tight operational and schedule constraints. With no pigging history and limited documentation, unknowns such as potential tight radius bends, wall thickness changes, and heavy scaling posed risks to both cleaning efficiency and data quality. Conformance to budget, scope, and schedule was of critical importance.

Pipeline Details

- Diameter: 6"
- Length: 200' each (2 lines)
- Product: Brine saltwater
- Location: Gas storage cavern facility

The Intero Integrity scope of work consisted of:

- Engineering and design of a tailored pumping spread and temporary launchers.
- Development of a progressive mechanical cleaning program.
- Provision of specialty cleaning pigs for brine scaling challenges.
- Execution of mechanical cleaning operations with adaptability for unexpected debris.
- Cleanliness verification scans to target residual scale and confirm readiness.
- Ultrasonic inline inspection including metal loss, geometry, and XYZ mapping.



Challenging Pipe Characteristics

The project posed several technical challenges:

- Minimal historical records; unknowns around wall thickness, bends, and debris.
- Lines had never been pigged before.
- Risk of scaling and deposits common in brine pipelines.
- Non-piggable configuration requiring temporary launchers and pumping spread.
- Work constrained to a short shutdown window.

Feasibility and Engineering

Intero designed and executed a full turnkey program. This included a progressive cleaning strategy using specialty pigs to address scaling and debris, coupled with real-time cleanliness verification scans to guide targeted cleaning. Once acceptable cleanliness was achieved, ultrasonic inline inspection was performed, capturing high-resolution metal loss, geometry, and XYZ data.



Inspection

The cleaning phase required flexibility as more debris was discovered than expected. Intero adapted by deploying more aggressive cleaning pigs, ensuring that pipelines were ultimately cleaned to the required standard. A special, compact ultrasonic ILI tool was utilized to perform a cleanliness verification assessment during the cleaning process, to help ensure maximum line cleanliness. The Ultrasonic inspections were executed smoothly, with excellent signal response and data capture. The inspection revealed areas of significant corrosion in one segment, allowing the client to take timely corrective action.

The Result

- Pipelines successfully cleaned and inspected within the scheduled shutdown.
- Excellent ultrasonic data collected for integrity reporting.
- Significant corrosion identified and documented for remediation.
- Project executed safely and within budget.
- Client established an internal reference on how to successfully clean and inspect brine lines.

Advantages

- **Turnkey Delivery:** Engineering, cleaning, and inspection integrated under one scope.
- **Adaptability:** Rapid response to unexpected debris with revised cleaning strategy.
- **Data Quality:** High-quality inspection data enabled actionable integrity decisions.
- **Client Confidence:** Project success led to extended collaboration with the client.

