Case Study

Tethered Ultrasonic Inline Inspection of a Submerged Water Intake Pipeline

Introduction

Intero was contracted to perform an integrity assessment of a 12-inch water intake pipeline supplying a centrifugal pump from a retention pond. The pipeline included a submerged intake section and a buried segment beneath a dike, creating significant challenges for conventional inspection methods.

Due to the absence of upstream isolation, any failure between the pond intake and the pump isolation valve could result in uncontrolled pond drainage, posing both environmental and operational risks.

To address these constraints, Intero developed a tethered ultrasonic inline inspection (UT ILI) solution, enabling safe inspection without exposing the pipeline or surrounding environment.

Pipeline Characteristics

- Product: Water
- Diameter: 12"
- Length: ~80 ft (inspected section)
- Type: Intake pipeline
- Location: Retention pond / dike crossing

The Challenge

The pipeline consisted of a submerged intake section within a retention pond combined with a buried segment beneath a dike, creating limited access and complex operating conditions.

The system was designed with no upstream isolation, meaning that any intervention between the intake and the pump isolation valve carried the risk of uncontrolled drainage of the pond. This imposed strict requirements on containment and operational control.

In addition, the pipeline had no receiver configuration, preventing the use of conventional pigging solutions. The combination of restricted access, environmental sensitivity, and system limitations required a solution that could safely operate within a fully controlled and enclosed system.

The Approach

We performed a feasibility assessment to develop a solution tailored to the pipeline's characteristics and operational constraints. Based on this evaluation, a tethered, bi-directional ultrasonic inline inspection approach was engineered.

The concept focused on maintaining full control of the inspection tool at all times while ensuring complete containment of the pipeline system. A temporary launcher was designed for installation at the pump location, allowing safe deployment of the inspection tool without requiring permanent modifications to the pipeline.

This engineered approach enabled inspection of the critical pipeline section while eliminating the risks associated with conventional pigging or open system interventions.

Inspection

Following removal of the centrifugal pump, a temporary launcher was installed at the pump location. The ultrasonic inspection tool was connected to a tether cable and deployed through a sealed pack-off system, ensuring full containment during operations.

The pipeline was prepared through controlled filling and air removal prior to launching the tool. The inspection tool was then pumped forward to inspect the submerged intake and dike crossing section.

Upon completion of the inspection run, the tool was retrieved using a winch-controlled tether system, maintaining full operational control throughout the process and eliminating the need for downstream access.

The Result

The inspection was successfully completed, providing full coverage of the targeted pipeline section, including the submerged intake and buried crossing.

The operation was executed without any environmental impact, and no excavation or dewatering was required. The ultrasonic inspection delivered high-resolution metal loss data, enabling a reliable integrity assessment.

The pipeline system was fully restored after completion of the works, with no permanent modifications required.

Advantages

- **Safe inspection of a submerged and buried pipeline section** under fully controlled conditions
- **No environmental exposure,** eliminating the need for dewatering or excavation
- **Engineered tethered solution** tailored to pipeline characteristics and system limitations
- **Full control of inspection tool movement** throughout the operation
- **High-resolution ultrasonic data** supporting accurate integrity assessment

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