Quest Integrity™
A TEAM Company

In-Line Inspection of Six Andeavor, Avon Oil Terminal Wharf Lines Completed Two Days Before Critical Turnaround Deadline

Comprehensive 360° in-line inspection and integrity assessment were conducted on marine pipelines at the Avon Oil Terminal, fronting the Suisun Bay near Martinez, Calif., during short turnaround at the Martinez Refinery.

Crucial pipeline inspection assessment completed despite operational challenges

The integrity management plan for six wharf lines overseen by Andeavor Logistics LP at the Avon Oil Terminal had included inspections in accordance with internal API 570 practices and US Coast Guard requirements. The US Coast Guard requires annual hydrostatic testing at pressures higher than standard operating pressures for piping that traverses above or nearby navigable and coastal waterways, while API 570 establishes the requirements and guidelines necessary to maintain the safety, reliability and mechanical integrity of these pipeline systems through use of non-destructive (NDE) inspection. But, the company knew standard NDE technologies were providing extremely limited corrosion awareness and integrity undersatanding of its system, raising concerns that lack of complete visibility was impairing the ability to judge the level of operational risk. And, because the wharf lines were in service at a facility within a protected nature sanctuary, maintaining the integrity of these pipelines was critical. The company reasoned an in-line inspection should be conducted on the entire system.

Wharf lines operated by Andeavor Logistics LP at the Avon Oil Terminal, fronting the Suisun Bay near Martinez, Calif.

Regardless of the technology used, inspecting the wharf lines would involve several challenges:

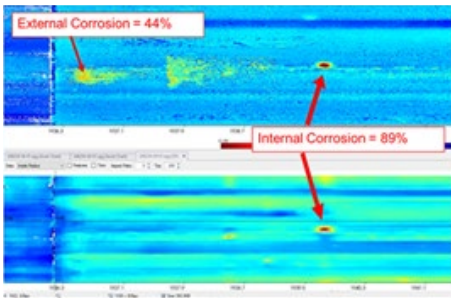
- No launcher or receiver barrels, lines considered unpiggable
- Inline inspection never performed, raising navigation questions
- Limited dock/wharf footprint, virtually eliminated the ability to use launcher barrels, pumps, heavy lifting equipment, requiring barge or ship produced water and pumping horsepower
- Incomplete construction documentation meant unknown pipe wall thicknesses, fittings, and bends that could cause conventional inspection tools to become stuck
- Inspection completion time for all six pipelines was two weeks, during refinery turnaround

Challenging piping fabrication the InVista tool is designed to navigate.

Inspection plan provides conclusive integrity assessment of wharf lines

Because of the operational challenges related to an inline inspection of their wharf lines, Andeavor Logistics contacted Quest Integrity to request they conduct an inspection of the wharf lines using the InVista™ Marine Ultrasonic Inline Inspection tool. Quest's unique technology and extensive experience navigating some of the world's most challenging pipeline configurations significantly reduced the risk of the tool becoming lodged in the pipeline during inspection.

Using the InVista tool, coupled with a project plan developed by Quest's Pipeline Integrity Management Services (PIMS) team, would enable the navigation of each pipeline by incorporating a looped system on the dock, using adjacent pipelines as water reservoirs to complete the inspection loop. Launchers, receivers, and pumps were located onshore in a safe operating environment and a custom looping manifold system was used on the docks to successfully inspect piping with minimal invasiveness to the entire system, wharf, and the sanctuary.



A previous inspection of one wharf line revealed a 44%-external anomaly, but not an 89%-interior anomaly just three feet downstream.

Application-specific technology delivers time- and cost-saving efficiency

The custom designed InVista technology, the uniquely configured looping circuit, and a 24-hr shift, on a project that also included setup, pipeline cleaning, inspection, and onsite data and preliminary data analysis delivery, was completed two days ahead of the two-week schedule. Based on the expedited analysis of the ultrasonic data, Andeavor implemented remediation for five of the six wharf lines and abandonment of one.

Had Andeavor Logistics not taken a proactive approach to their pipeline integrity management program of these six wharf lines, failure was imminent, timing was the only question. Previous methods of inspection had not uncovered the most severe anomalies and the failure of these lines near the water or across the bird sanctuary they traversed could have been catastrophic. By conducting the integrity assessment of the six wharf lines, Quest Integrity helped Andeavor avoid this risk in the most effective and efficient manner possible.