

CUSTOMER CASE STUDY

Advanced Solution: Inspecting Deepwater Risers and Flowlines, West Africa.

Overview

Managing the integrity of downstream pipelines has been challenging due to various factors such as limited access, safety concerns, and other complexities. InVista[®] Subsea, an advanced ultrasonic (UT) in-line inspection (ILI) tool from Quest Integrity, provides a solution for these challenging and difficult-to-inspect pipelines.

Quest Integrity recently successfully completed the ILI of a 12" production loop for a major deepwater pipeline operator in West Africa. The subsea system was configured as a 16km piggable loop comprising two risers, four flowlines, and two manifolds supporting a total of seven producing wells. The inspection was required for regulatory compliance and to assess the integrity of the production flow loop, ensuring it was fit-for-service.

The Operator had experienced previous challenges with their conventional ILI vendor in similar assets and searched for a solution to inspect the production loop asset and accurately detect corrosion damage. The Operator eventually selected Quest Integrity's InVista Subsea UT ILI technology due to the tool's superior flexibility and navigational capabilities.

The 12" production flow loop posed the following ILI challenges:

- Unknown extent of an inner diameter (ID) restriction from a defective subsea valve at one of the manifolds
- Previous ILI failures in similar assets
- Deepwater (high pressure) operations
- Limited launcher/receiver space on the floating production storage and offloading (FPSO) facility
- Pipeline downtime / deferment limitations

Solution

Quest Integrity mobilized personnel and two (2) InVista Subsea inspection tools to the FPSO. The inspection campaign commenced with a cleaning program, and four (4) cleaning pig runs were conducted in dead oil using a progressive non-aggressive pigging approach.

Upon completion of the cleaning runs, the InVista Subsea UT ILI tool was launched and propelled in dead oil at 114.8° F, at a rate of 2.447 cubic miles / hour to achieve an approximate scan rate of 0.50 m/s. All the data was collected in a single run. Upon retrieval of the InVista Subsea tool, the UT measurement data was downloaded on the FPSO, and an initial field analysis was performed. The InVista Subsea ILI tool provided 100% circumferential and axial inspection coverage of each riser and flowline in the production loop, as well all the jumpers, subsea equipment and topside piping.

Quest Integrity delivered to the client a preliminary report within 14 days and a Level 2 fitness-for-service final report in accordance with API 579-1 / ASME FFS-1 within 45 days.

Inspection Results

Following field inspection data verification, Quest Integrity analyzed and assessed the inspection data obtained and performed an API 579-1 / ASME FFS-1 Fitness-for-Service assessment. The inspection data was analyzed for wall thinning and anomalies such as corrosion, deformation, and lamination using Quest Integrity's Steamline Universal Platform™ software. In addition, the pipeline's Remaining Strength Factor (RSF) was calculated per a Level 2 local metal loss assessment described in Part 5 of the API 579-1 / ASME FFS-1 Fitness-For-Service standard.

Conclusion

The completion of the ILI provided the Operator with a comprehensive understanding of their asset and significant cost savings in overall project execution. In addition, the following factors contributed to Quest Integrity's successful inspection campaign:

- **Ease of Operation** - InVista Subsea Tool is a lightweight hand-held tool allowing for simple hand launching / receiving operations ensuring no heavy lifting, or bulky transport.
- **30% Local Collapsibility** - The InVista Subsea tool collapsibility of approximately 30% allowed for full and low-risk navigation of the production loop, reduced local cross-section, including the ID restriction from a defective valve on the PLEM.
- **Reduced Operational Risk** - The InVista Subsea tool's bi-directional capability allows it to be reversed and received back at the launch location via reverse flow, either as part of a planned bi-directional inspection or if an unknown restriction is encountered in the line greater than 30% is encountered, reducing operational risk.
- **Simplified Inspection Process** - The InVista Subsea tool's high-resolution UT sensors acquired direct measurements providing geometry and wall thickness data in a single inspection run; no gauging and caliper pigging was required leading to time and cost savings.
- **Secondary Tool** - A backup InVista Subsea tool was mobilized on-site as a standard operational practice to increase project efficiency and minimize the chance of delays at no extra cost to the client.

Quest Integrity is a premier energy technology company, developing asset integrity and reliability management services to help companies optimize performance, mitigate risk, and improve operational planning. Our integrated services consist of advanced inspection and engineering assessment solutions to help our partners in the global energy industry.

Quest Integrity's unmatched engineering experience and expertise coupled with our profound understanding of customers' needs, enables us to provide tailor-fit and comprehensive integrity solutions to help our clients improve their asset performance and create sustainable value.

Our innovative approach allows us to utilize groundbreaking technology and develop in-house solutions for difficult to inspect assets.

We challenge convention.