



CHALLENGE CONVENTION

InVista[™]

Ultrasonic In-line,
Bi-directional Marine-line
Inspection Tool

InVista™ ultrasonic in-line inspection tool surmounts marine loading line inspection challenges

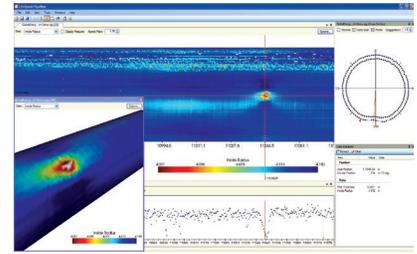
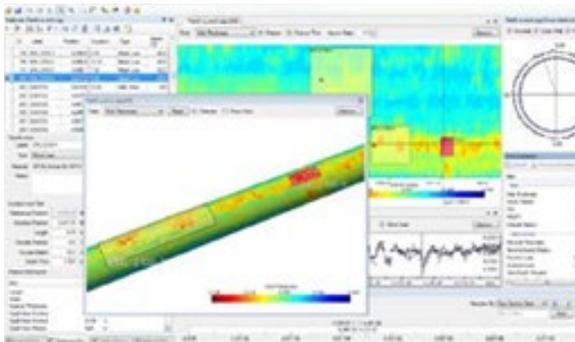
Operators with ties to marine facilities that convey products through wharf- and subsea-loading lines know inspecting them means dealing with line systems that are generally inaccessible, unpiggable, and characterized by operational constraints, resulting in costly and complicated inspection options.

The InVista ultrasonic (UT) in-line inspection (ILI) bi-directional tool provides single-pass, combined geometry and metal-loss data with 100% overlapping coverage. Designed to overcome the most demanding wharf- and subsea-ILI conditions, it provides unmatched data accuracy, operational efficiency, and navigational capabilities.

Delivers accurate comprehensive inspections

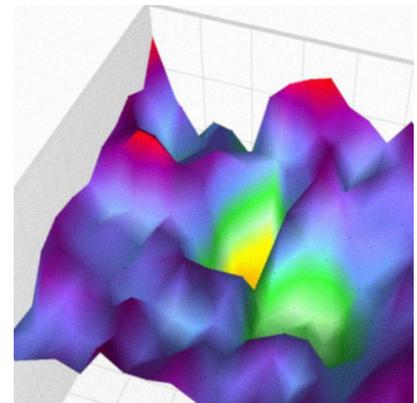
InVista offers operators several key advantages:

- Provides ILI-inspection resolution and coverage unaffected by pipe supports or metal-to-metal contact
- Reduces wear impact and debris collection
- Incorporated geo-spatial data
- Produces less signal distortion while providing powerful 2D and 3D user interfaces



Damage Mechanisms Identified

- + General Corrosion
- + Corrosion under insulation (CUI)
- + Erosion
- + Soil environment corrosion due to coating failure
- + Pitting
- + Deformation (e.g., dents, ovality, bulging, swelling) (HCA) pipe sections



Reliable data calculations provide operational assurance

Based on inspection results, an advanced engineering assessment can be made using Quest Integrity's proprietary software, Streamline™ Universal Platform, which calculates the remaining life and fitness-for-service of marine-loading lines in accordance with API 579/ASME FFS-1 standards.

Accurate corrosion growth rates information helps reduce future failures while optimizing integrity management and operations.

Innovative compact design simplifies deployment

The InVista tool is a self-contained, lightweight, and easily transportable ILI answer for 2- to 48-in diameter and dual diameter marine lines. The tool's miniaturized electronics and unique form factor often requires no lifting machinery and its bi-directional capability enables it to be loaded, launched, received, and unloaded from a single point.

InVista inspections can be conducted under substantially reduced pressure requirements without permanent modifications to piping systems. It is also capable of negotiating back-to-back be bends with >90° short-radius turns, bore restrictions, step changes, reduced port valves, and limited or missing launcher/receiver facilities.

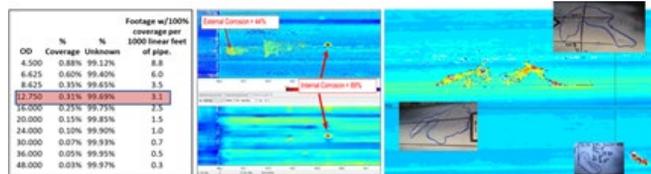


Ensures cost effective marine line integrity

Traditional inspection methods provide a false sense of security. Typically less than 1% of actual marine-line integrity is understood using non-destructive and hydro-testing methodologies.

InVista technology ensures marine-line integrity for operators through efficient and comprehensive inspections that minimize offline status.

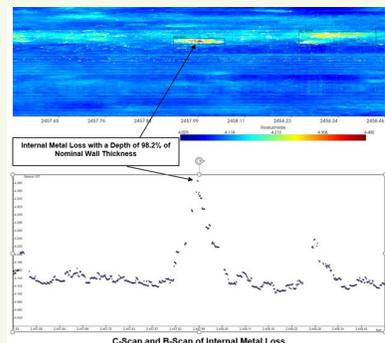
Quest Integrity can provide onsite turnaround and rapid data analysis as it relates to flaw locations, enabling real-time operational decisions. And, InVista inspections never permanently magnetize loading lines, eliminating demagnetization repairs.



CASE STUDY

In-Line Inspection of Six Andeavor, Avon Oil Terminal Wharf Lines

1. InVista Marine was used to inspect six “unpiggable” wharf lines with no history of in-line inspection, limited documentation, no launcher or receiver barrels and a small dock/wharf footprint that ruled out the use of larger equipment.
2. Quest Integrity engineered a solution that enabled navigation of each pipeline through a looped system on the dock, which used adjacent pipelines as water reservoirs to complete the inspection loop.
3. Quest completed the inspection **two days ahead** of the project’s two-week deadline. InVista Marine was able to analyze pipelines that were previously deemed inaccessible and discovered numerous defects missed using other inspection methods. In one line, **89% internal corrosion** was recorded just **3 feet from a prior inspection point**.





Innovative integrity management solutions to guard marine area environments and assets

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Environmental and emergency response costs for pipeline failures in and around marine areas is 30 to 100 times higher than onshore piping.

Added to this are the costs associated with unplanned shutdowns of feedstock and interruptions of export revenue. InVista offers fully integrated, API 579 Compliant Level II Fitness-for-Service marine-line evaluations.

Quest Integrity combines innovative technologies, software, engineering assessment and the deep expertise of our people to consistently deliver unparalleled solutions for the integrity management of crucial assets.