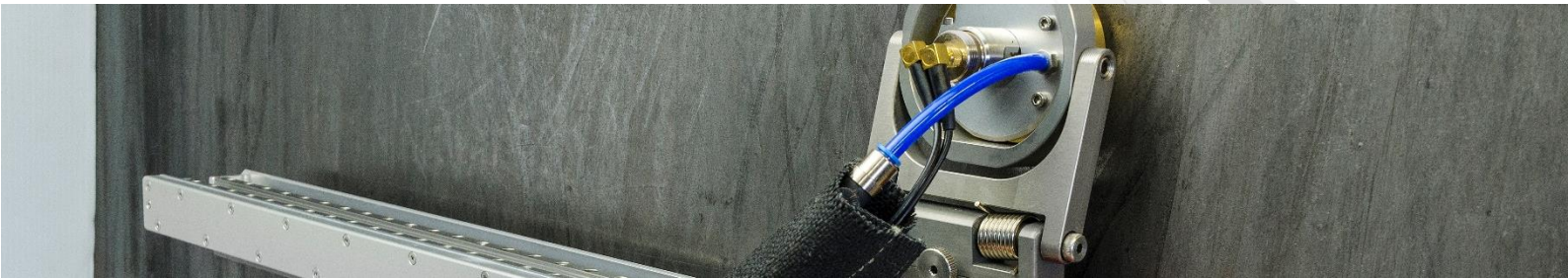


In-service automated UT corrosion mapping of pipeline at risk of sulfidation

In-service, high-temperature corrosion mapping to maximise productivity, safety and plant availability.



Overview

A solution was sought by IRISNDT, a global supplier of integrity, inspection and engineering services, for an automated corrosion mapping of a high-temperature hydrocarbon pipeline susceptible to sulfidation.

Automated UT is a primary means of determining areas of accelerated corrosion from sulfidation, as it the most ubiquitous damage mechanism from naturally occurring sulphur compounds in hydrocarbon products when in contact with low alloy or carbon steel components above a critical temperature of $\sim 260\text{ }^{\circ}\text{C}$ / $500\text{ }^{\circ}\text{F}$. Remaining wall thickness measurements were required to made on a number of identified piping circuits on a refinery and required the use of UT transducers which were able to produce reliable scans with sufficient wear resistance to survive maximise productivity over the length of the circuits.

The Challenge

A $\sim 5\text{ m}$ piping circuit consisting of 6" and 8" NPS diameter carbon steel piping carrying hydrocarbons was identified as being at risk of sulfidation. Ultrasonic corrosion mapping is the primary means of determining areas of accelerated wall loss, and is traditionally undertaken using multiple probes due to soft polymer or graphite wear faces, which leads to degradation of data during the scan, and replacing probes throughout.

The Solution

Ionix' HS582i dual element 5 MHz transducers, based on the HotSense™ ultrasonic platform, were deployed with automated magnetic crawlers and standard UT flaw detectors making for immediate implementation.

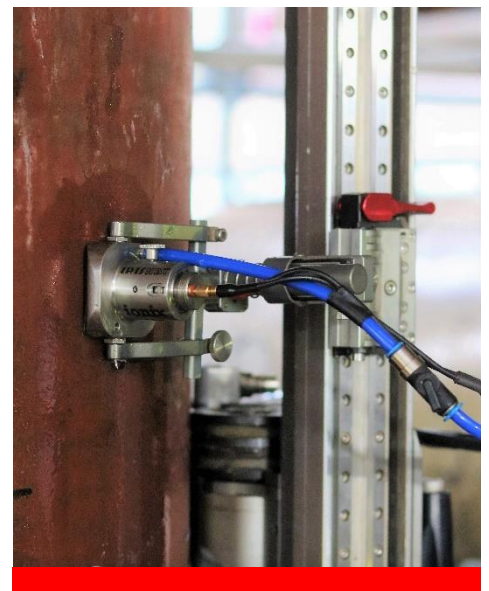
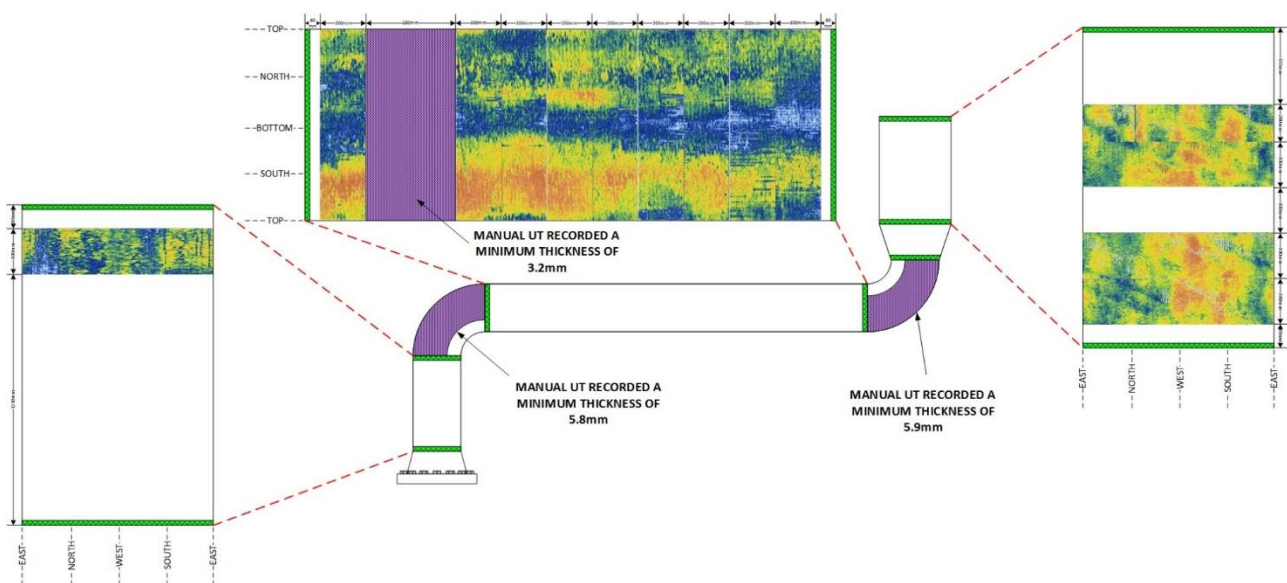


Fig. 1 Ionix HS582i probe in use in a probe holder fitted to an automated corrosion scanning system on refinery piping circuit identified as at risk from sulfidation.

- The HS582i transducers were chosen for their wide operating temperature range; -67 °F to +1,022 °F (-55 °C to +550 °C).
- Increased wear resistance / longer probe life maximized continuous usage and measurement collection
- Manufactured in compliance with international standards to easily fit directly into existing UT inspection procedures
- Compatible with commercial scanners and UT sets. Quick to deploy, calibrate and begin scanning.

Execution

- The Ionix HS582i probe was deployed as a replacement for the incumbent phased array corrosion mapping transducers.
- Wall thickness maps on the designated piping circuits were undertaken with the HS582i using conventional UT flaw detectors, and required no additional training or setup.
- Multiple section thickness measurements were made with a single probe without causing damage to the probe from excess wear.



Testimonial

"The HS582i has become our go to transducer for wall thickness measurements - whether its manual point measurements or scanning. The wide operating temperature range and high wear resistance makes it the perfect tool for the modern inspection professional. The Ionix transducer has made a significant difference increasing productivity" UT Level 3