

Providing the Most Precise Diagnosis

For Pinhole and Pitting Corrosion



Challenge

In 2012, NDT Global performed an ultrasonic metal loss (UM) inspection for a US-based operator on a 8", 60 km (37 mi) pipeline, with known external corrosion. The inspection identified corrosion features, but did not have the highest-resolution scanning grid for an accurate sizing of small pitting corrosion.

The operator began a rehabilitation campaign to include verification digs of over 51 features, to validate the accuracy of the UM inspection. The digs showed the successful identification of all features.

Upon further review of the non-destructive examination (NDE) data, analysts identified many features outside of the performance specifications. Several of these features were under-called, the majority of which were below what was at the standard detection and sizing thresholds in the industry at the time.

Without the correct feature depth, the operator could not plan the appropriate remediation.

Solution

Following the initial dig verification program, NDT Global worked alongside the operator to create a new set of requirements focusing on the accurate sizing of pittings and pinholes.


An ultrasonic metal loss with pitting resolution technology was chosen, this UMP configuration is specified to detect 5 mm (0.20 in) diameter pinholes at $\geq 90\%$ probability of detection (POD).

The UMP performance specification states a depth sizing accuracy of ± 0.4 mm (± 0.016 in) at 90% certainty. With its now standard UMP service, NDT Global has increased its specs to 1.5 mm (0.06 in) axial sampling.

The operator forecasted an accurate rehabilitation campaign, comprised of 45 digs addressing over 100 identified features.

After comparing the NDE and ILI measurements, NDT Global found 93% of the features reported by the ILI were accurate to the depths measured by the NDE.

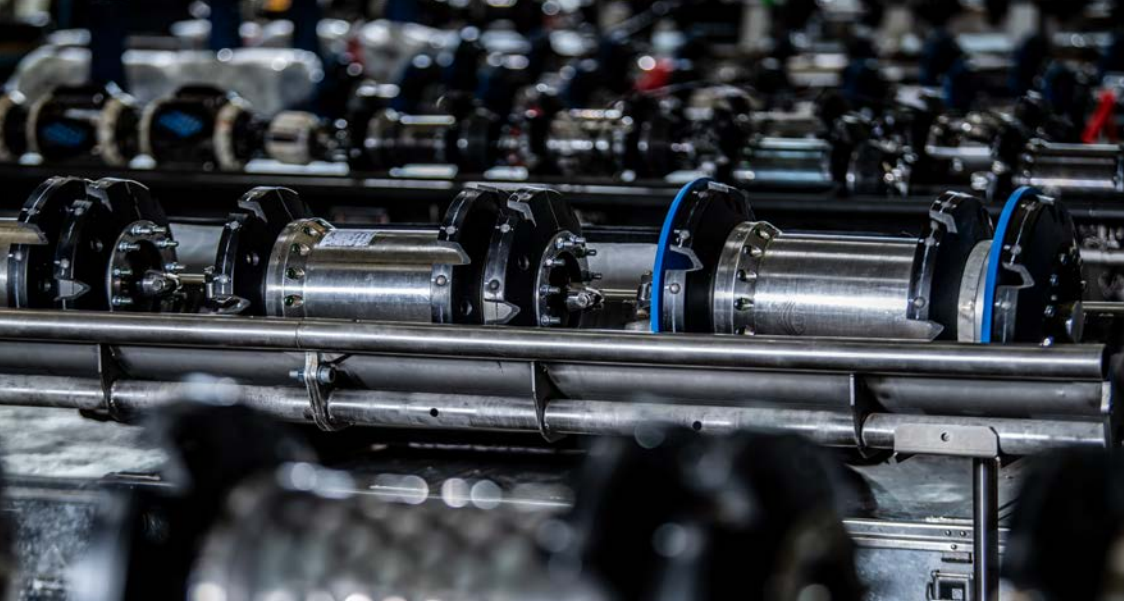
 Axial Cracks

 Circumferential Cracks

 Metal Loss

 Geometry Ovalities

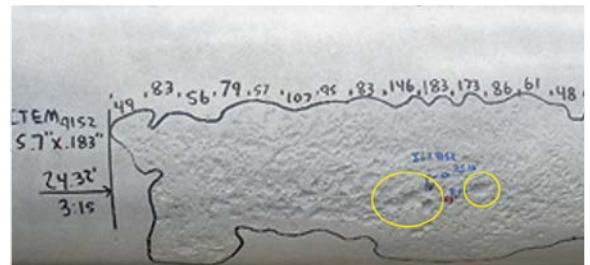
 Mapping



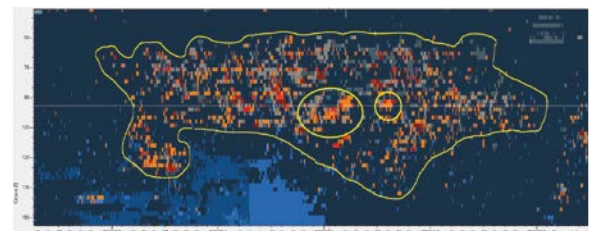
Results

- NDT Global provided the **highest accuracy** measurement of steep-sided, deep pits and pinhole corrosion in this pipeline. This highlights the capability of NDT Global's UMp configurations to detect and size difficult to find anomalies with small diameters. Such accuracy enables operators to maximize the impact and return of investment of their dig programs.
- **Assurance.** Following the inspection results, the operator had confidence in knowing the true corrosion state of its pipeline. The proven accuracy of the data provided helps to reduce risks associated with the pipeline integrity plan. Such results allow operators to improve their ability to maintain critical assets in a cost effective manner. In instances such as this, any originally planned allowances and conservatism tighten up.
- **Significant savings.** The accuracy of inspection analysis data that NDT Global provides ensures that analysts target the identified sections in the field, rather than applying wide tolerances, saving the operator money in its pipeline integrity plan. The pipeline operator can monitor developing anomalies and implement a long-term remediation program with strategically selected digs.

The performance specification of NDT Global's UMp configuration states a depth sizing accuracy of ± 0.4 mm (± 0.016 in) at 90% certainty.



Example of steep-sided pitting corrosion within area of general corrosion



Data analysis scan of same steep-sided pitting corrosion