Removing stresses from pipeline inspection

Thomas Hennig, of NDT Global Ireland, looks at the integrity challenges facing pipeline operators, and the developments and innovations the company has introduced to address them.

Understanding the need to continually evolve and develop, NDT Global has introduced innovations over the last 12 months, delivering better data to alleviate the stresses involved with combating corrosion and cracking found in pipelines.

**HIGHER ACCURACY AND RESOLUTION TO ILI FOR CRACKS**

Frequently invisible to the naked eye, axially oriented cracks that go undetected compromise both the long- and short-term integrity of a pipeline, potentially leading to operational failure. Stress corrosion cracking (SCC) is a classification of cracking that poses a particular threat to pipelines.

Traditionally manifesting as crack colonies aligned axially on the external side of the pipe (see Figure 1), SCC also develops in the transverse pipelines.

Material properties such as toughness, residual strength, and yield strength form the basis of crack assessment. Instances where the depth is the integral quantity for calculating the safe operating pressure of a pipeline place particular prominence on the use of size to assess a crack.

Due to the complex nature and continual evolution of cracking threats to pipelines, the development of ILI tools to provide the highest resolution and most accurate data possible is necessary. With a long-term goal of eliminating pipeline failures due to cracking, NDT Global’s introduction of enhanced sizing means this goal is closer to realisation.

This methodology brings with it precision to crack sizing, scalability of the experience and knowledge of its UT crack inspection team.

**MITIGATING COSTS FROM SEvere CORROSION**

Be it internal or external, corrosion severely affects the integrity of a pipeline. Internal corrosion can arise when the transported medium carries traces of water or bacteria, while external corrosion is often the result of third-party damage or environmental factors.

Various factors increase the corrosion growth rates affecting a pipeline. Due to this variety, it is imperative for pipeline operators to have as much information as possible regarding the status of their pipeline and its corrosion growth rates.

To mitigate the volatility of a pipeline’s operation due to corrosion, forecasting the rate of change becomes a necessity further highlighting the importance of conducting multiple inspections. The information made available through conducting numerous ILIs pair operators in a better position to understand the rate of change affecting their pipelines, while also forecasting the remaining lifespan of a line.

This information is particularly pertinent in relation to highly corroded pipelines, where analysts use it to extrapolate the anticipated reduction in the highest possible allowable safe operating pressure. In 2015, NDT Global committed to offer only high resolution metal loss inspection services to combat the threats posed by corrosion.

The Eco series 1.0 UMP tool delivers a two-fold improvement in the minimum sizing threshold over standard inspections, reliably detecting defects as small as 5 mm (0.5 inch) in diameter. Higher resolution inspection of features identifies the true deepest point of a pinhole morphology within a larger area of corrosion with an overall shallower depth.

**WORKING IN UNISON**

While these enhancements being technical developments, they are merely part of the grand scheme of things in relation to pipeline integrity management programs. The ability to complement these technological advances with an experienced and knowledgeable team ensures that NDT Global provides pipeline operators with a comprehensive ILI service.

The accuracy with which NDT Global understands the need to continually evolve and develop, NDT Global has introduced innovations over the last 12 months, delivering better data to alleviate the stresses involved with combating corrosion and cracking found in pipelines.

**FIGURE 1: an example of an SCC colony.**

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