



IN-LINE INSPECTION (ILI) ANALYSIS SUPPORT

OVERVIEW

Operators have several options for integrity assessments of their pipelines include coating surveys, CIS, depth of cover, direct assessment, pressure testing, and in-line inspection (ILI). Among all integrity assessment methods, ILI yields the highest discovery of anomalies and is the most cost-effective method on a per-mile basis. ILI is your best choice to meet your regulatory, safety, operational, and reliability demands. ENTRUST Solutions Group has a team of highly qualified and experienced engineers in multiple offices across North America who provide ILI analysis support to pipeline integrity.

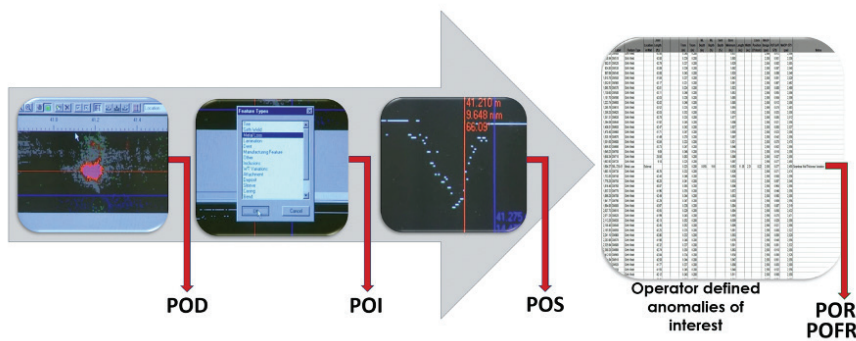
With decades of operational and project experience, our professionals provide expertise in ILI data analysis of various technologies (MFL, hard spots, ultrasonic metal loss and crack detection, EMAT, deformation, and mapping), metallurgy, and GIS data integration. ENTRUST can assist through the life cycle of the inspection or perform specific tasks, including:

PROJECT PLANNING AND SUPPORT

- ILI plan and procedures support
- ILI tool selection, bidding, and procurement
- Risk, contingency planning, and threat assessments
- Scheduling
- Post-run analysis
- Data quality assessment in the field and data acceptance
- Preliminary report evaluation and data analysis verification
- Immediate conditions and permitting
- Integrity dig management
- ILI verification and validation per API Std 1163
- Direct examination of anomalies including metallurgical analyses
- NDT results evaluation, repair determination, and repair/replacement decisions

PRE-INSPECTION ACTIVITIES

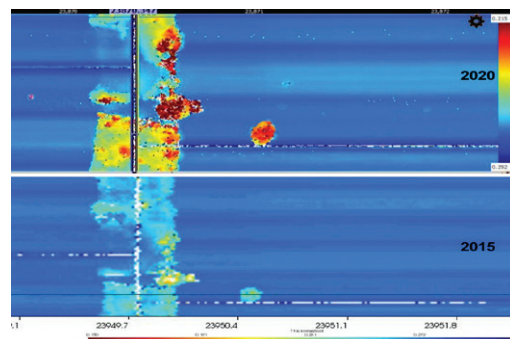
- ILI program management
- Pipeline cleaning method selection
- Potential debris sampling
- Software Analysis for data integration with other integrity evaluations (CIS, ACVG, etc.)



ILI verification and validation levels 1, 2, and 3 per API Std 1163. Evaluation of probabilities of detection, identification, sizing, reporting, and false reporting

ADVANCED ILI DATA ANALYSIS AND POST-ASSESSMENT

- Run-to-run analysis, comparison, and growth rate estimates for crack, deformation, hard spots, and metal loss surveys. Run Comparisons (Corrosion growth and crack growth signal-to-signal calculations)
- Global and local strain analysis for dents and deformations. Strain Demand and Strain Capacity Analyses
- Advance analysis services (MFL, hard spots (HS) MFL, C-MFL, ultrasonic for crack detection/metal loss, and EMAT)
- Secondary ILI data analysis and assessments for channeling corrosion, narrow axial external corrosion, selective seam weld corrosion
- ILI trouble shooting, speed excursions, sensor loss, tool rotation, and data degradation
- Final report evaluation and performing run to run comparisons with previous assessments to establish any monitored conditions, one-year, or two-year conditions
- Integrated solutions (combining seamlessly GIS and integrated management solutions (IMS) to match tens-of-thousands of anomalies from multiple ILIs and other critical surveys
- On-site metallurgical evaluation during the pipeline excavation, NDE activities and comparison with ILI data analysis results
- Project completion reports containing all completed documentation and data from the duration of ILI Projects
- Enhanced ILI crack and corrosion signal analysis (Foot by foot analysis, develop response plans, feature confirmation)
- Corrosion consulting and management of environmental assisted cracking, pitting corrosion, erosion, microbiologically influenced corrosion, and corrosion under insulation
- Fitness-for-service assessments and calculation assessments for corrosion and crack anomalies (B31G, B31G Modified, Effective Area (RSTRENG), API 579-1/ASME FFS-1, NG-18, LnSec, Newman-Raju, and Failure Assessment Diagram)
- Screening ILI data and looked for SCC, hook cracks, lack of fusion, and other axially oriented anomalies using transverse flux technologies such as Rosen ILI Axial Flaw Detection and BJ's Transverse Field Inspection (TFI)
- Advance ultrasonic data analysis and assessment of clad pipe, solid corrosion resistance alloys (CRA), CRA weld overlay, risers in high pressure/ high temperature offshore pipelines
- Offshore pipeline design support for piggability



Corrosion growth rate estimation