



IN-LINE INSPECTION (ILI) CAPABILITIES

Overall Project Management:

- Cost, scope, schedule, and risk management
- Procurement and contractor management support
- Stakeholder and communications management
- “Cradle-to-grave” dig management
- GIS-based dig program management software

Tool Selection:

- Integrity Management Plan (IMP) and/or threat review for appropriate tool technologies
- Identification and selection of ILI technologies practical to identified threats (e.g. caliper, magnetic flux leakage (MFL), circumferential magnetic flux leakage (CMFL), straight beam ultrasonic testing (UT), electro-magnetic acoustic transducers (EMAT))

Deliverable: Summary of all commercially available technologies and analysis of which to apply to the system at hand.

ILI Feasibility Assessment:

- Assessment of line for mechanical pig passage
- Evaluation of technology and its requirements (e.g. UT requires liquid couplant)
- Identification of any pipeline modifications that may be required (e.g. longer launcher/receiver, bend configuration, valve replacement, wall thickness (WT) changes, diameter changes)

Deliverable: Summary report with line-log/pipe-tally type analysis.

Pipeline Modification Design:

- Design and construction support, if required (e.g. trap install or re-design, valve replacements, meter bypass design)

Deliverable: Design and construction documents

Specification Writing:

- Establish ILI Vendor reporting requirements (scope and timing of reporting deliverables)

Deliverable: Specification or project-specific guideline that the client can internalize.

Pipeline Cleaning and Gauging:

- Specification of chemical cleaning agents
- Specification of mechanical cleaning tools
- Tool procurement
- Subcontractor management

Deliverable: Summary report of chemical and cleaning tool selection, PM documents

Above Ground Markers:

- Location selection
- Survey placement

Deliverable: AGM recovery forms.

ILI Operations*:

- Field coordinator – monitor run conditions from launch to receive, oversees pig tracking team(s)
- Client support with tool run medium flow control for optimal run conditions
- Tool tracking

Deliverable: tool tracking calculators, GIS-based tooltracking web portal

** LSC does not operate any valves, trap doors, etc. during tool runs.*

ILI Acceptance:

- Evaluation of tool run data coverage for acceptance
- Evaluation of preliminary ILI Vendor report for acceptance

Deliverable: Submitted checklist reports for data, preliminary, and final reports, pipeline feature population analysis



INTEGRITY MANAGEMENT

IN-LINE INSPECTION (ILI) CAPABILITIES

Dig Selection:

- Confirm all digs with required response intervals
- Evaluate predicted anomaly populations and recommend validation dig selection
- Develop remediation plan

Deliverable: Summary of recommended digs, remediation plan.

Dig Package Creation:

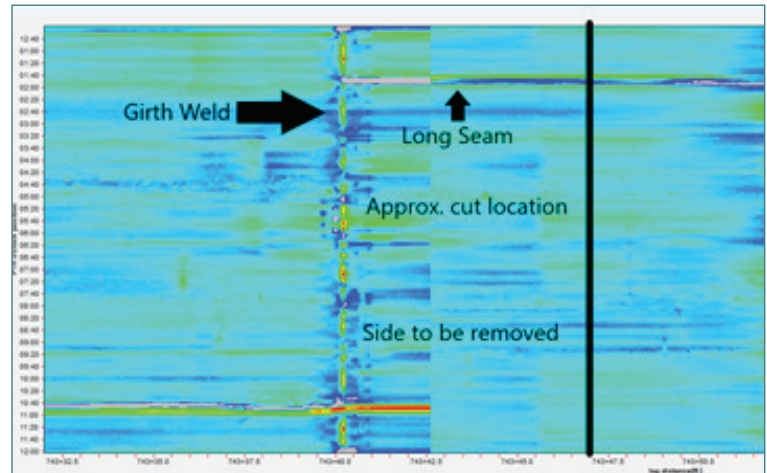
- AGM verification
- Line location and site sweeps
- Redundant dig site location using GPS and chainage from a known position using tool data

Deliverable: Dig survey form(s).

Dig Inspection:

- LSC “Dig Tech” includes non-destructive examination (NDE), magnetic particle testing (MT), phased array ultrasonic testing (PAUT), creafom, sub-meter accuracy survey equipment, coating inspection, & environmental site data documentation
- Confirm dig and anomaly location, examine defects, document findings, complete client-required reporting
- Increase data delivery efficiency and records management accuracy through engineering review of inspection reports and submission through a streamlined GIS-based web portal

Deliverable: NDE reports, client-required reports, ILI-specific reports, dig data web portal



ILI signal data review for acceptable tie-in locations

Engineering:

- Review of ILI data prior to and during digs
- QC of NDE reports and repair selection advice during digs
- API 1163 validation report to summarize findings (e.g. predicted vs actual results, unity plots, stats, dig summaries)
- Remaining strength calculations, response time calculations, and reassessment interval determination based on NDE results and tool performance
- MAOP Verification and Final Report Analysis

Deliverable: API 1163 report, ILI raw data alignment reports, summary of repair selection.