

IN-LINE INSPECTION (ILI) ASSESSMENT PROGRAM

COMPREHENSIVE ILI ASSESSMENT OF PIPELINES WITH UNMATCHED EXPERTISE

TURN-KEY AND CUSTOM-TAILORED ILI SOLUTIONS TO MATCH YOUR INTEGRITY PLAN

SERVICES



1. Pre-Assessment & Feasibility Studies

- Threat and technology integration
- Feasibility studies
- AGM design for mapping inspections
- Pipeline trap design, modifications and management of construction



2. ILI Execution & Field Support

- Partnership with EnviroCal to inspect 6 to 12-inch OD pipelines (MFL, Deformation, Mapping)
- Tool familiarity and operational knowledge
- ILI Validation Spool (API 1163 level 3 validation compliant) – MFL & Deformation only
- Field support for tool run project management and data quality assessment review



3. Post Assessment Analysis

- Code compliant response criteria evaluation (49 CFR 192 & 195)
- Fitness-for-Service evaluations
- Statistical growth calculations
- Probability of exceedance (PoE) analysis
- Reassessment interval determination



4. Program Updates, Reassessment

- ILI Program audits and enhancements based on code requirements
- Root Cause Analysis (RCA)
- Engineering Critical Assessment (ECA)
- Training

SPECIALIZED SOLUTIONS

- Over 30 years of combined ILI experience on the team
- Deep integrity management expertise and threat knowledge
- Expertise in pioneering new technology for threat assessments

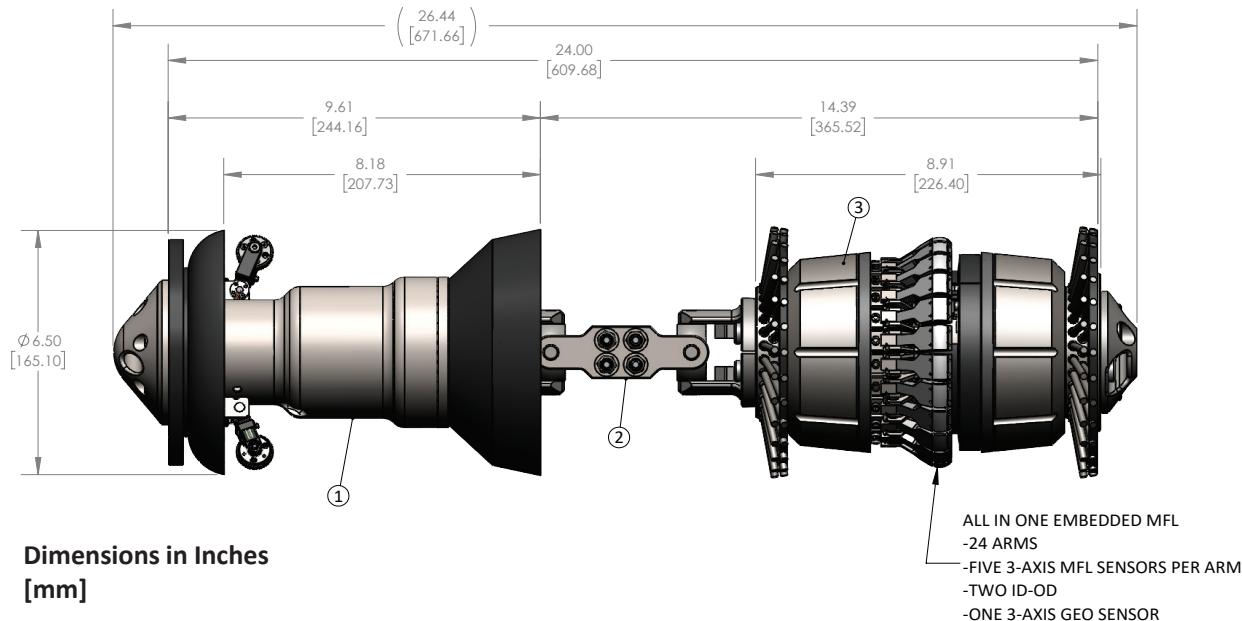
- ILI Tool: EnviroCal partnership Flexibility for pipeline inspections with back-to-back 1.5 radii fittings in the 6-12- inch range
- ILI Validation Spool
 - Proven performance to ensure accurate tool results
 - Mitigates unnecessary risk and cost

- Pit-to-pit matching of multiple ILI runs leading to practical decision-making regarding anomaly evaluation and repairs
- Analysis tools and strategies to complete Probability of Exceedance (PoE) analysis and forecasting.
- Probabilistic analysis for consideration of tool tolerance

- API 1163 training courses
- APTITUDETM calculates predicted failure pressure and remaining life of steel pipelines
- SynthesisTM probabilistic analysis tools
- NDE programs and support

Structural Integrity has partnered with EnviroCal to deliver an innovative way to inspect complex, small diameter pipelines

EnviroCal 6" RS-MFL - Designed to navigate complex pipeline configurations, including back-to-back 1.5R fittings in the 6 to 12-inch range, to provide accurate inspection results.



SENSORS

Total Sensors: 456
Geometry: 48
IDOD: 48
Tri-axial MFL: 360

Odometer: 2 Accelerometer: Tri-axial Gyroscopes: Tri-axial
Recording Frequency: Up to 6000 Sa/s
Equivalent Axial Sampling: 0.039" / 1 mm
Circumferential Sensor Spacing: 0.051" / 1.32 mm

PHYSICAL CAPABILITY

Minimum Bore: 5.3" / 134.62 mm
Minimum Bend Radius: 1.5D back-to-back
Maximum Pressure: 1500 PSI / 103 Bar
Temperature Range: 167° F / 75° C to -20° F / -29° C
Max Velocity (within 0.432"): 7 mph / 11 kph or 10 ft/s / 3 m/s
Wall Thickness: Up to 0.432" / 11mm
Run time: 50 Hours
Weight: Tool - 55 lbs / 25 Kgs
Tool with tray - 96 lbs / 43.6 kgs
Shipping - 420 lbs / 191 kgs

REPORTING/PERFORMANCE SPECIFICATIONS

With 80% certainty and 95% confidence

Metal Loss

Minimum Depth: 10% of W.T.
Depth Accuracy: \pm 10% of W.T. (\pm 15% in Seamless)
Length Accuracy: \pm 0.39" / 10 mm
Width Accuracy: \pm 0.39" / 10 mm

Geometry

Minimum Depth: 0.5% of Pipe OD
Deformation Accuracy: \pm 0.5% of Pipe OD
Ovality Accuracy: \pm 0.5% of Pipe OD
Length: \pm 0.1" / 2.54 mm
Width: \pm 0.1" / 2.54 mm

Location

Orientation Accuracy: \pm 5°
From Closest Girthweld: \pm 0.1"
From Closest AGM: \pm 0.1%
Overall Line Length: \pm 0.15%
Bend Angle Accuracy: \pm 5°
Bend Radius Accuracy: \pm 0.25D

IMU

Overall Accuracy (X, Y): \pm 3 feet (\pm 1m)
Overall Accuracy (Z): \pm 9" (\pm 0.2m)
Recording Frequency: 1092 Samples Per Second