

# 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

## SPECIALIZED SOLUTIONS



### 1. Pre-Assessment & Feasibility Studies

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

- 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



### 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

- 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



### 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

- 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



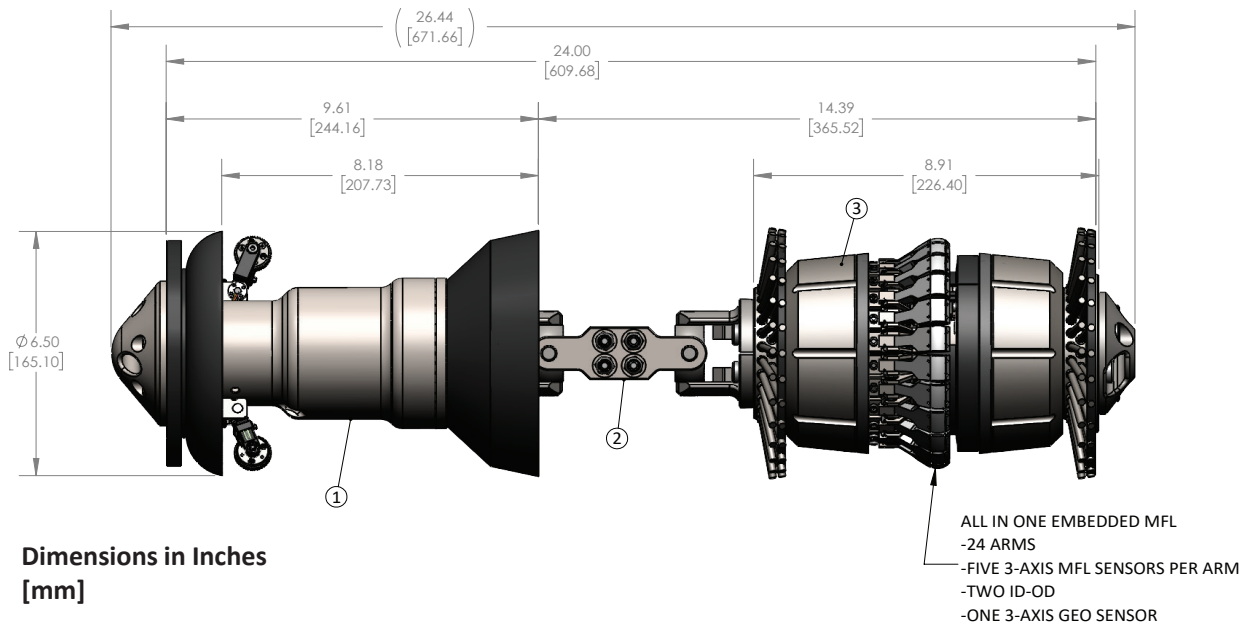
### 4. Program Updates, Reassessment

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

- API 1163 training courses
- APTITUDE™ calculates predicted failure pressure and remaining life of steel pipelines
- Synthesis™ 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.



## REPORTING/PERFORMANCE SPECIFICATIONS

With 80% certainty and 95% confidence

### 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" / 11 mm

Run time: 50 Hours

Weight: Tool - 55 lbs / 25 Kgs

Tool with tray - 96 lbs / 43.6 kgs

Shipping - 420 lbs / 191 kgs

### 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:  $\pm 5^\circ$

From Closest Girthweld:  $\pm 0.1"$

From Closest AGM:  $\pm 0.1\%$

Overall Line Length:  $\pm 0.15\%$

Bend Angle Accuracy:  $\pm 5^\circ$

Bend Radius Accuracy:  $\pm 0.25D$

### IMU

Overall Accuracy (X, Y):  $\pm 3$  feet ( $\pm 1$  m)

Overall Accuracy (Z):  $\pm 9"$  ( $\pm 0.2$  m)

Recording Frequency: 1092 Samples Per Second