

# RoGeo MHT Service

## In-line High-Resolution Axial Strain Measurement



Optimize pipeline uptime and performance



World's largest ILI tool fleet ensures high availability



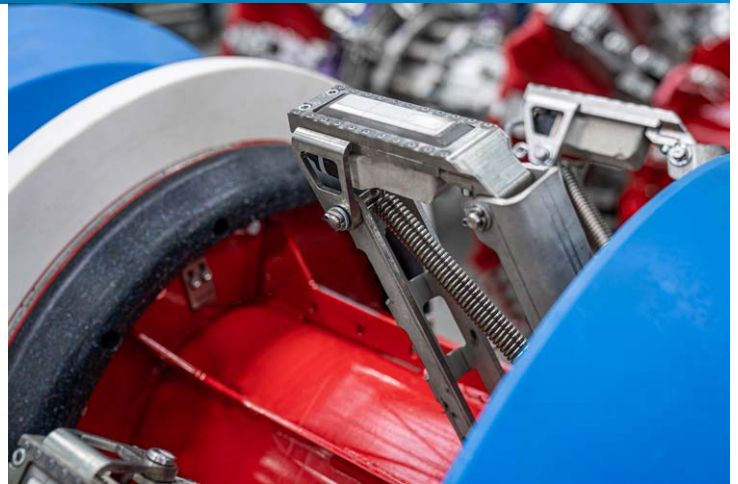
Enables integrity assessments of on- and offshore pipelines

Pipeline assets are at risk of reduced operational performance, damage and eventual failure because of geometrical deformation. High-resolution in-line inspection (ILI) and mapping of your pipelines can detect, categorize and locate deformation, enabling you to act before minor damage turns into a major shutdown. You cannot predict geohazards, climate extremes that might damage your pipelines. However, you can design and implement a holistic and integrated geometric deformation risk management strategy. This reduces your risk and, as part of a wider integrity management framework, can identify multiple threats to further safeguard your pipeline assets.

A very specific deformation of a pipeline is strain. A pipeline stressed by earth movement, wash-outs, or landslides responds with a corresponding strain pattern. In particular, the axial strain is a challenge since it is not an obvious deformation, like e.g., bending of a pipeline or ovality. Depending on the actual layout of the pipeline, an axial strain can occur several hundred meters away from the original cause. Another aspect is the differentiation between an elastic and a plastic strain of the pipeline material since the corresponding integrity assessment and measures are entirely different. High-resolution in-line inspection and mapping of your pipelines can detect, categorize, and locate stress and strain, enabling you to prepare an appropriate response.

### Characterizing axial strain and differentiation between elastic and plastic strain

RoGeo MHT uses a magnetic hysteresis technology sensor (MHT) to accurately measure uniform longitudinal stress from axial loading caused by a geohazard event. The technology goes one step further by differentiating between the elastic and plastic strain of the pipeline material.



- Detects and sizes axial strain pattern on the pipeline
- Enables early and appropriate mitigation by differentiating between elastic and plastic strain
- Combines different integrity assessments and measures to deliver a single view of the stresses and strains affecting your pipeline assets

### RoGeo MHT Supports Pipeline Health Monitoring in Geohazard Zones

- Improves pipeline uptime by monitoring and managing pipelines in geotechnically active regions and pipelines that are susceptible to significant strain
- Avoids catastrophic pipeline failure through the assessment of circumferential pipeline anomalies such as cracking
- Plans inspection, site survey, and maintenance internals by tracking changes to your pipeline's strain and stress profile

# Technical Specifications

## Detection and Sizing Accuracy for Stress and Strain

	Stress & Strain	Elastic Elongation	Plastic Elongation <sup>1</sup>
	POD	90 %	90 %
	POI	90 %	90 %
	Detection Threshold at 90 % POD	0.01 %	0.5 %
Material Specific Calibration <sup>2</sup>	Absolute Strain Sizing Accuracy	+ - 0.01 %	+ - 0.02 %
	Absolute Stress Sizing Accuracy	+ - 21 MPa	-
Generic Calibration <sup>2</sup>	Absolute Strain Sizing Accuracy	+ - 0.03 %	+ - 0.02 %
	Absolute Stress Sizing Accuracy	+ - 63 MPa	-

<sup>1</sup> POD, POI, and Threshold are achieved as stated. Sizing accuracy is given only for areas affected by bending.  
<sup>2</sup> at 80% certainty

## Location and Orientation Capabilities

Axial position accuracy from reference marker	1:1000 (1 m on 1000 m marker distance) (1 ft. on 1000 ft. marker distance)
Axial position from closest weld	±0.1 m (±4")
Circumferential position accuracy	±10°

The axial positioning accuracy is given at 90% certainty and is based on the following conditions:

- Distance between upstream (u/s) and downstream (d/s) marker/reference point < 2000m (6560 ft.).
- Actual above-ground distance to both u/s and d/s marker/reference points have been measured and correlated.
- The difference between the pipeline and soil contour is less than 0.2 m (8").

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