



CASE STUDY

# **SIMULTANEOUS CRACK AND METAL LOSS INSPECTION**



## **CHALLENGE**

As part of a major oil and gas production company's pipeline integrity plan, a scheduled MFL metal loss inspection of a 48" diameter offshore loop line was halted when the caliper run encountered a severe dent. This 48 km (30 mile) pipeline is a crucial asset of the operators.

Due to the identification of a severe dent, successful inspection had now become a difficult challenge as a new technology would be required to inspect the loop line. The selected tool must be capable of negotiating the substantial ID reduction anomaly and inspect for mechanical damage, metal loss, gouges, and crack-like anomalies, all in a single run. Achieving high accuracy whilst maintaining a critical reporting threshold for cracks (1 mm depth, 25 mm length) was an essential element for the operator's post inspection Finite Element Method integrity assessments. It was also essential that the ILI report clearly and concisely interpret the results providing thorough analysis for future survey reference.

The entire program had to be completed within 6 months, from contract award to submission of final report, Fitness for Purpose assessment and Finite Element Method report.

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## **NDT GLOBAL DELIVERED COMPREHENSIVE INSPECTION DATA OF COMBINED CRITICAL FEATURES IN A SINGLE RUN**

## **SOLUTION**

After evaluating available solutions, the operator asked NDT Global to inspect the pipeline. A combination run consisting of Evo 1.0 UC, Evo 1.0 UMP and Atlas UG robots delivered a comprehensive inspection in a single run. These technologies accurately detect, locate, and size metal loss and axially oriented crack-like anomalies, providing high-resolution mapping and XYZ coordinates for the pipeline. In particular, the company's innovative Enhanced Sizing for ultrasonic crack inspections removes depth sizing boundaries that previously existed for depths above 4 mm (0.16 in).

NDT Global's technology is unique in its ability to perform a combination UT compression wave type ILI robot run, with XYZ mapping, for the detection of metal loss and lamination anomalies, while having the ability to simultaneously complete crack detection.



## RESULTS

➤ **High-accuracy inline inspection** using NDT Global's ultrasonic technologies successfully detected metal loss and crack-like features.

➤ **Critical reporting threshold** for cracks 1 mm (0.04 in) depth, 25 mm (0.98 in) length) was maintained.

➤ **Results will guide future inspection** frequency, using trend analysis, and anomaly tracking, while applying only the most stringent internationally accepted codes, standards and specifications.

➤ **Data and recommendations** enable the operator to prevent pipeline failures by; removing or repairing significant defects, determine the interval between future inspections with or without repair of identified defects and calculate maximum allowable operating pressure (MAOP).

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## TECHNOLOGY SELECTION GUIDE

		● Metal loss	● Crack	● Milling	● Deformation	● Mapping										
		Internal	External	Narrow axial	Gouges	Axial	Hook	Circumferential	Lamination	Lack of fusion	Dents	Wrinkles	Roof topping	Ovalities	Bends	Pipe coordinates
<b>Metal loss</b>	Internal	●														
	External	●	●													
	Narrow axial	●	●	●												
	Gouges	●	●	●	●											
<b>Crack</b>	Axial	●	●	●	●	●										
	Hook	●	●	●	●	●	●									
	Circumferential	●	●	●	●	●	●	●								
<b>Milling</b>	Lamination	●	●	●	●	●	●	●	●							
	Lack of fusion	●	●	●	●	●	●	●	●	●						
<b>Deformation</b>	Dents	●	●	●	●	●	●	●			●					
	Wrinkles	●	●	●	●	●	●	●	●	●	●	●				
	Roof topping	●	●	●	●	●	●	●	●	●	●	●	●			
	Ovalities	●	●	●	●	●	●	●	●	●	●	●	●	●		
<b>Mapping</b>	Bends	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Pipe coordinates	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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