

Pipeline Life Extension

Installation: Subsea gas pipeline

Project: Subsea pipeline life extension. The pipeline is operating since 1990.

Client: Confidential

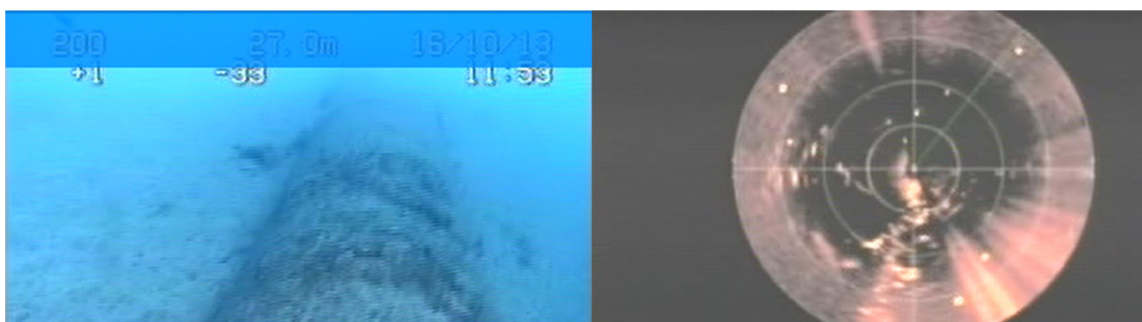
Date: 2016

Subsea Pipeline Life Extension¹

Many pipelines are approaching or have exceeded their original design life. Many companies want to continue with the operation of these assets; recovering oil and gas reserves or carry on with the transmission or distribution of products.

Procainsa SA carried out the pipeline life extension for this subsea pipeline based on ISO / TS 12747: 2011, which provides a guide to carry out the process and evaluate the feasibility to extend the life of the pipeline above the specified life design.

This case shows the life extension of an offshore gas pipeline. The case will focus on the implementation of a new cathodic protection system using sacrificial anodes.



ROV Inspection

To avoid confidentiality issues, some pipeline data has been intentionally omitted or distorted.

The subject pipeline is a 18" pipeline was constructed with a steel type API 5L X52 and was commissioned in the early 90's. Its MAOP was 120bar and currently its operating pressure is 55bar. Its product is gas.

Initially the current state of pipe integrity was studied. The existing documentation is obsolete, only Operation data could be used, which discarded fatigue problems.

It was necessary to wait until the next year to carry out a new inspection campaign, where ROV and ILI inspections were carried out, the future integrity of the pipeline was analysed: future threats identification, extension life assessment and remaining pipeline life assessment.

¹ This case was presented during the International Conference and Exhibition in the Field of Corrosion and Cathodic protection, CEOCOR 2016 CONGRESS- 17-20 May 2016, Ljubljana (Slovenia)

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After study the inspection data, corrosion rate assessment, cathodic protection survey, it was established that the pipeline can continue to operate safely, provided it maintained the same system of operation and inspection.

The only problem was found in the cathodic protection system of a protection structure. The photograph shows that the anodes were totally depleted.

Based on the DNV-RP-B401 standard, a new cathodic protection system was designed using Al-Zn-In Alloy sacrificial anodes.



Corrosion on the Protection Frame

The identified remedial works on the protection frame and the recommended maintenance shall be conducted; more details are given in next table.

Threats	IMR Tasks	Inspection Frequency	Year											
			1	2	3	4	5	6	7	8	9	10		
Corrosion	Anode replacement (Pipeline)	No required												
	Anode replacement (Protection frame) and commissioning new CP systems	Asap	✓											
	A follow up survey should be considered within 1 year	As required	✓											
	CP Survey	5 yearly				✓						✓		
	ROV survey	5 yearly				✓						✓		
	In line inspection	Max 10 yearly											✓	
	Repair Pipe wall thickness	No required												
Gas dew point	Monitoring													
Fatigue	Operational data (pressure, temperature, flow...)	Monitoring												

Project Manager - "This work was carried out in our oldest pipeline and critical in our gas network. The Procainsa study was professional from the beginning to the last day of the project. The table with year-to-year recommendations was a great help to forecast the maintenance and inspection budget. "