

Case study – 16 inch crude oil separator line

Integrity issue

A 16 inch crude oil separator line was suffering from internal corrosion. The measured remaining wall thickness was 3.4 mm. It was estimated that the corrosion rate was 0.6 mm/year. The repair was designed for a 2 year life where it was assumed therefore that the remaining wall thickness at end of life of the repair was 2.2 mm. It was proposed to use a Futurewrap composite repair to reinstate the integrity of the pipework.

Design

The design of the Futurewrap repair was according to ISO 24817. The design approach was for pipework strengthening only with allowance for the remaining wall thickness of the pipework. The design parameters were; internal pressure 12.8 bar, temperature 230°C, design lifetime 2 years. The repair design resulted in a thickness of 5 mm (6 layers) of Futurewrap Glass/HT with an axial length of repair of 1120 mm.

Installation

The installation steps are shown in the photographs. The pipework was depressurised. The surface preparation was to ST3. Full QA/QC measurements were made to demonstrate that the Futurewrap repair was applied in accordance with ISO 24817.

Summary

A 16 inch crude oil separator line suffering internal corrosion was repaired using a Futurewrap Glass/HT composite repair. The repair was completed within 3 days allowing the pipework to be re-pressurised with the pipework returned to its original integrity.



Initial condition of pipework



Completed repair