

Bespoke Clamp Cures Conundrum – Saving Millions in the Process



Overview

A 36-inch crude oil line was suffering from wall thinning as a result of internal corrosion. TEAM was called in to design, engineer and manufacture a long-term solution that could be installed without the need to shutdown production.

Project: Bespoke designed self-sealing encapsulation engineered to provide a long term, cost-effective solution to the problem of internal corrosion

Location: United Kingdom

TEAM Service: On-Line Leak Sealing and Repair

Need and Challenge: The 36-inch crude oil line was suffering from wall thinning as a result of internal corrosion due to general wear and tear. One option would have been to replace the line, but this would have involved shutting down production of the oil field, with costs running into many millions of pounds in terms of lost production, time and an unplanned shutdown – clearly not a favorable option.

Solution and Outcome

TEAM was called in to design, engineer and manufacture a long-term solution that could be installed without the need to shutdown production. Within two weeks, an initial bespoke enclosure had been designed taking into account all considerations and operator requirements. A template was then constructed to ensure that all measurements were accurate and that the structure would clear all obstructions.

Not only was there the issue of complex geometry to consider in designing the solution, but a further consideration was the fact that there was an immovable obstruction just 100mm away from the 180° return, making access awkward. TEAM's solution was a specially-designed six-part self-sealing repair clamp, mitered to match the geometry of the pipeline. Fluoro-elastomer was employed providing a high integrity seal, which is compatible with the hydrocarbon line contents over the required design life of the encapsulation. Once fitted, the

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enclosure was injected with resin to provide the defective pipeline with support.

The design was validated using Finite Element Analysis (FEA) to ensure that the design met code requirements and that deformation, particularly at the clamp's joint faces, was within acceptable tolerances to ensure leak-tight integrity. The enclosure was engineered to the design pressure of the line (20 bar) and is a long-term solution to the problem of internal corrosion/erosion.

This work may have been performed by a company subsequently acquired by TEAM.