Case Study

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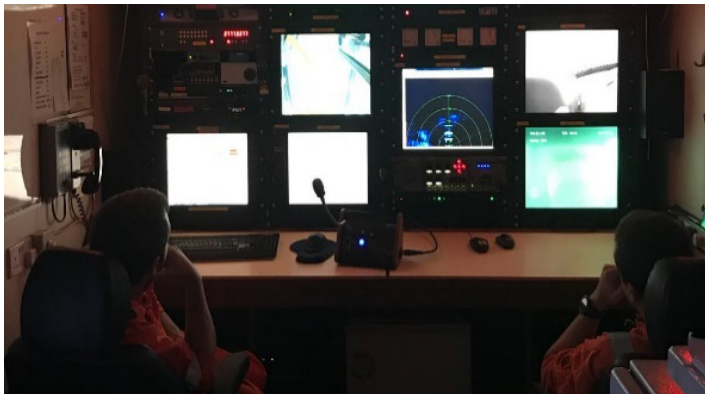
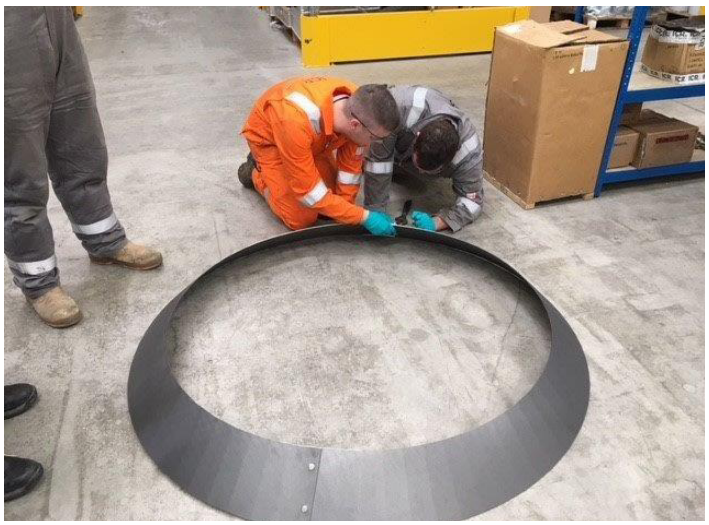
Technowrap™ Engineered Composite Repairs

2K Splashzone - Subsea Clamp Overview

Date
July 2018
Client
Middle East Operator
Location
Arabian Gulf





Scope

ICR was initially contacted regarding a crack that had developed on a subsea 48" pipe carrying crude oil in Saudi Arabia. ICR proposed an engineered composite repair solution to repair the defect, however on this occasion the client opted for an alternative solution and installed a sleeve clamp which they believed was a more tried and tested option. However, following clamp installation, the client reported the pipe was still weeping and the clamp had left a 6mm gap. In order to retain pressure and avoid an oil spill, ICR intervened and provided full project management of a unique and complex remedial scope of work.

The long term goal for the client is to cut and replace the pipe therefore the scope required a solution which would retain pressure so the line could be purged at a later date for replacement. ICR recommended an overwrap of the clamped pipe using an engineered composite repair system which would be installed by trained air divers and project managed topside by two experienced ICR technicians. A metal shim was fabricated to butt up against the clamp and give a gentle gradient to help the cloth transition from the clamp to the pipework.

Solution

ICR engineered a bespoke Technowrap™ 2K Splashzone composite repair design to encapsulate both ends of the clamp to ensure fluid and pressure retainment.

Design Conditions	
Depth	33m
Design Temperature	140°F
Operating Temperature	75-140°F
Design Pressure	590 PSI
Max. Operating Pressure	200 PSI

This was a completely tailored approach providing a solution to avoid an oil spill which to ICR's knowledge, has never been done anywhere else in the world.

Challenges

Due to the complex geometry of the clamp and to create a smooth repair profile, two custom steel collars were fabricated by IPS in Aberdeen then shipped along with composite materials to the Middle East to ensure quality control in the UK.

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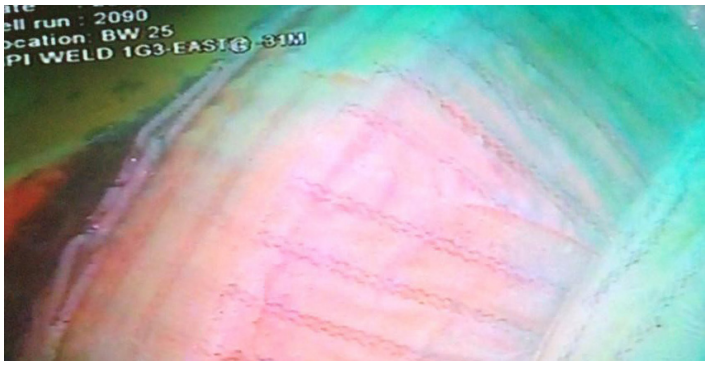
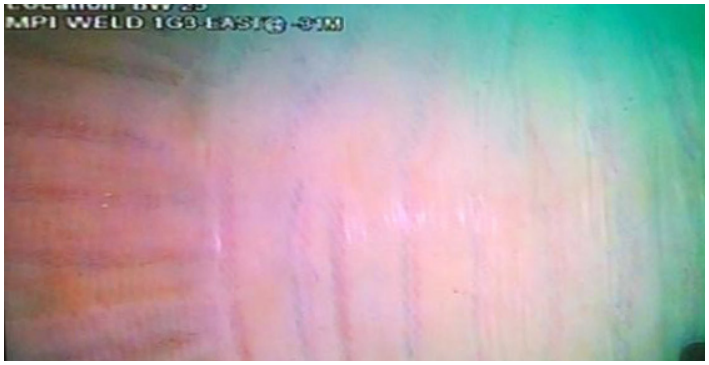


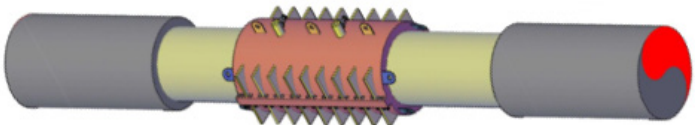


Third party composite repair trained divers installed the collars at either side of the clamp and once in place, composite repair materials were prepared topside and sent down to divers for application, all of which was closely supervised and directed from a live video feed on onboard.

Pressure testing was delivered over six hours following curing. ICR successfully completed the complicated subsea composite repair scope of work in 10 days from first application to the conclusion of the pressure test.

Results & Benefits

- Integrity solution that supports the client's long term strategic goals
- Significant costs savings on environmental mitigation as well as a cost effective alternative to pipe replacement
- A quicker solution delivered by multi-skilled divers and technicians
- No disruption to production and avoided an emergency shutdown



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