

Composites Restore Offshore Riser Integrity

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Malaysia

Pipe Details

- 305-mm (12-inch) diameter riser with back-to-back bends
- 40 bar (580 psi) operating pressure
- 35° C (95° F) operating temperature

Summary

- Extensive external corrosion of a riser on an offshore oil and gas asset
- Corrosion extent 60%
- Trained local installers carried out repairs, installing Clock Spring Snap Wrap, followed by Clock Spring Contour to restore structural integrity to the riser
- Production was not interrupted while the repair was carried out
- The repair will allow the riser to operate in this environment for 20 years

Offshore asset owners closely monitor offshore assets for structural integrity to prevent safety concerns caused by corrosion. Seawater expedites corrosion, and offshore structures often develop pits, which in addition to weakening the metal structure, can have an equally negative effect on joints and welds. Over time, stress caused by pits lead to structural weaknesses and if left unaddressed, eventually cause fractures.

In examining the risers on an offshore production facility, an operator offshore Malaysia identified extensive pitting in a 305-mm (12-inch) riser with back-to-back bends. In some portions of the pipe, pitting had resulted in 60% wall loss. The company addressed this problem with a composite repair.



Riser with localized pitting



Installation of Snap Wrap & Contour

A team of Clock Spring specially trained local experts cleaned the riser, grit-blasting it an SA 2.5 surface preparation, removing rust, coating, and mill scale to produce a near-white surface prior to the application of the Clock Spring repair. The defects were identified and marked so they could be appropriately treated. The defects, which were concentrated at the bends, were first repaired with 76-mm (3-inch) wide Snap Wrap strips along a 1.8-m (6-foot) length of pipe.

In cases like this, where Snap Wrap applied around pipe bends is placed with spacing that exceeds 13 mm (0.5 in), the repair is overlaid by a Clock Spring Contour system.



Riser repair: Before and after Contour installation



Riser repair: Before and after Contour installation

In this application, Contour overwrapped the entire 5-m (16.4-foot) length of the repair to create a solid covering. This hybrid system of prefabricated sleeves and in-the-field cured composite repair merges a robust structural laminate with a flexible protective outer composite

jacket. The repair is designed to last for two decades.

The Clock Spring Contour repair was performed in a day and a half of on-site work without taking the riser out of service.

There are nearly 3,000 trained Clock Spring installers around the world who are qualified to provide repairs with Clock Spring products. Clock Spring regularly offers training classes for installers and can custom design training for individual company needs.