

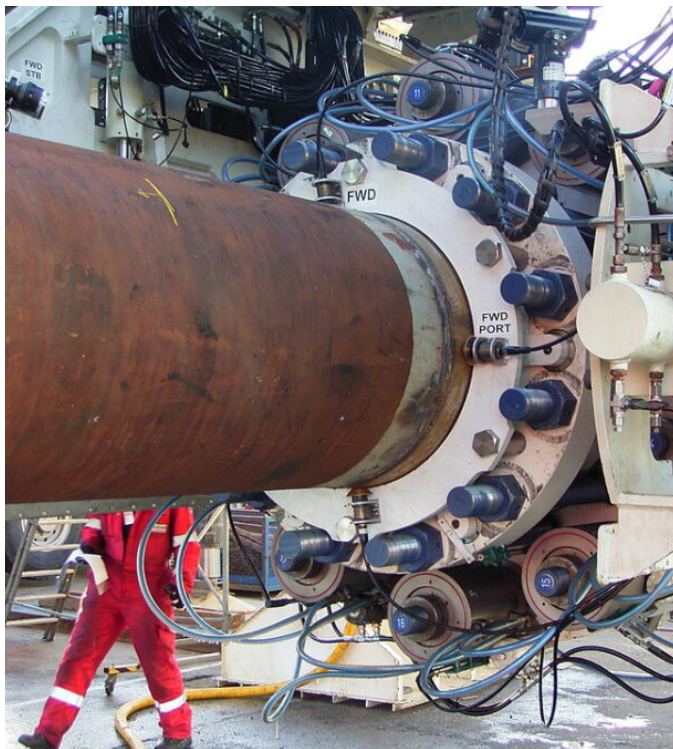
MORGRIP® ACHIEVES ANOTHER FULLY DIVERLESS CONNECTOR SUCCESS

CASE STUDY

MORGRIP® TEAMED WITH A MAJOR NORWEGIAN ENERGY COMPANY TO SUCCESSFULLY COMPLETE A COMPLEX DIVERLESS REPAIR TO A 30", 210BAR PIPE, 200M DOWN IN THE NORWEGIAN OIL AND GAS FIELDS.

THE PROBLEM

The pipeline which links between two large platforms in the North Sea was damaged by the anchor of an unknown vessel. Repairs were originally planned into a long-term work schedule. A routine inspection then discovered a slight leak at the damage site and a permanent repair became essential.



01 // MORGRIP® mechanical connector, ready for installation

THE SOLUTION

A new section of pipeline and two huge mechanical connectors had to be moved into place from giant steel frames in an intricate operation using remotely-operated installation systems. This highly complicated repair involved the MORGRIP® team and engineers from the Norwegian energy company, as well as its repair contractors.

Due to the pipe positioning at 200m depth, a diverless repair was essential. Under a working agreement, the Norwegian energy company maintains a contingency stock of connectors with MORGRIP® to allow emergency repairs to start as soon as possible.

The repair operation was far from simple. Even in perfect conditions, the depth, size and weight of the pipe would have caused problems; occasionally poor weather on the surface added to the complexities.

The damaged pipe was coated with concrete and asphalt, therefore prior to the arrival of the repair team, the seabed around the pipeline was cleared by the Norwegian energy company to allow adequate working conditions.

As the repair began, 100 tonne, H-frame rigs were lowered from the surface to hold the severed ends of the pipe. These are designed to hold and manoeuvre the pipe ends into position using dynamic positioning and remote cameras.

A separate Coupling Installation Frame (CIF), capable of ultra precise alignment movements, was lowered to the sea bed holding a new 25m section of pipe with a connector on the end. The two pipe ends were carefully aligned inside the connector and hydraulically energised.

The CIF was repositioned on the other end of the insert pipe and the procedure repeated to complete the repair. External pressure testing facilities within the connector ensured that the installation could be fully tested prior to any further pipeline operations or testing.

Joint testing and other repairs allowed oil and gas flow from the two platforms to resume just five months after it was originally shut down.

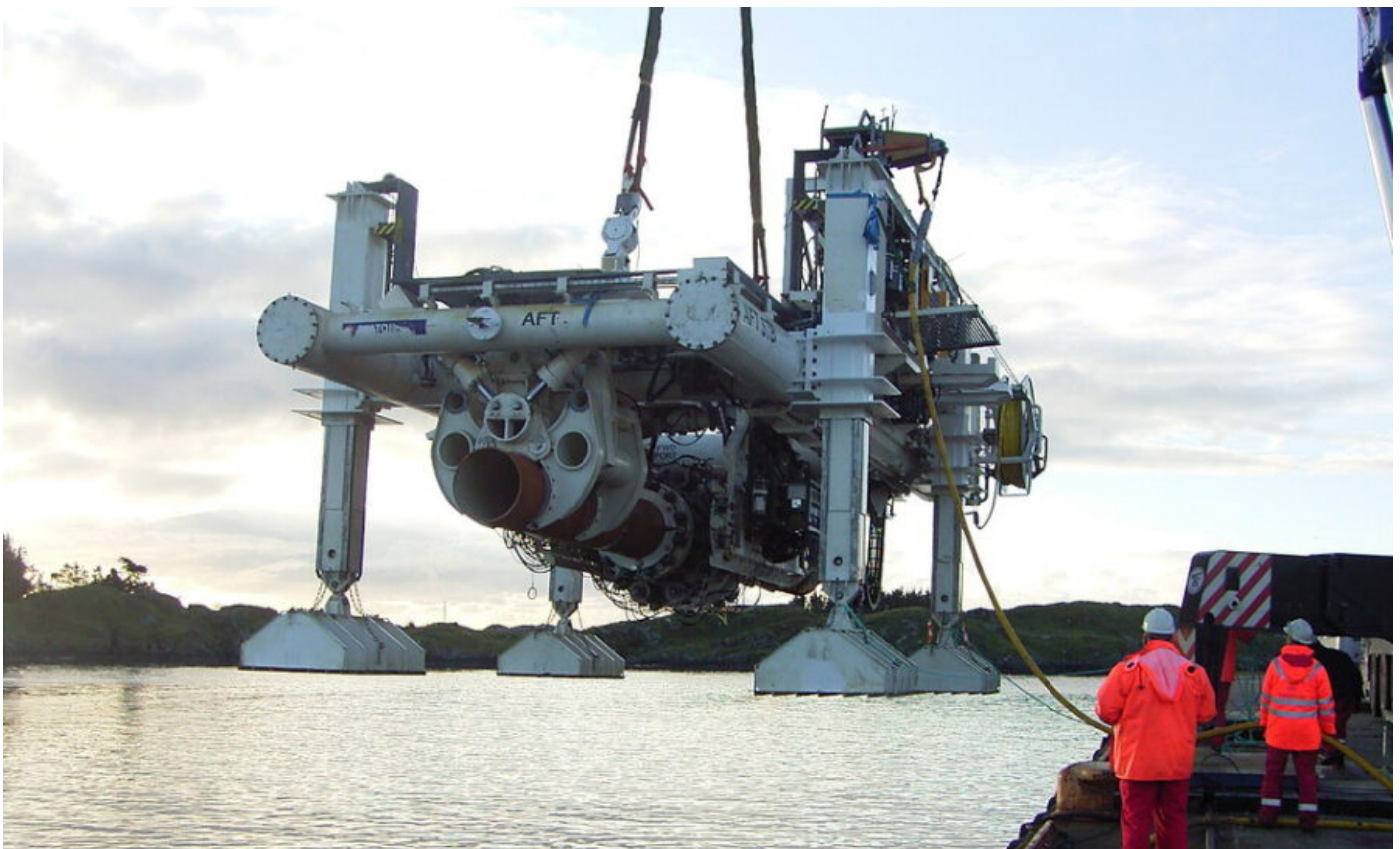
“The experience gained from the repair will boost the knowledge base for future pipeline repairs in emergency response work on the Norwegian continental shelf.”

Vice President of the Norwegian energy company

MECHANICAL CONNECTOR KEY FEATURES

- MORGRIP® mechanical connectors had already been proven in deepwater. In 2002, the company mounted the first diverless repair over 300m below the North Sea on a 12" pipe. The system is capable of diverless repairs up to 42" pipe diameter.
- MORGRIP® connectors are designed to accommodate the installation forces caused by pipe stab as pipes are aligned. Seals and ball bearings are retracted during these phases, so loads are minimised.
- Following pipe stab-in, the ball bearings are released and a multi-stud tensioner tightens stud bolts along the length of the connector body. Ball bearings on the inner surface of the connector indent and the seals tighten onto the pipe ends, holding them tight. Hydraulically-operated motors rotate the hexagonal nuts to mechanically lock the connector on to the pipes, and joint integrity can be checked with an external pressure tester on the connector.
- Connectors are available in pressure ratings of up to 2500#, and are DNV approved as a permanent replacement for a welded connection.

For more information visit www.connectorsubsea.com.



02 // The connector installation frame is lowered into the water