

## Case Study

### MorSafe™ technology extends life of asset



**Above** Hydratight's MorSafe™ 6" CL1500 Flange Clamp solution

**Below** Hydratight's MorSafe™ 10" CL1500 Flange Clamp solution

The need to replace corroded or damaged bolts fitted to live pressurized flanges is becoming increasingly common for many offshore operators working to extend the life of aging assets. Operational requirements mean asset life needs to be extended without disrupting day-to-day activities. It is vital these repairs are completed with unquestioned safety and rigorous efficiency.

#### The Challenge

An oil and gas major identified a problem following an inspection of its turret pipework of a Floating Production and Storage and Offloading vessel (FPSO) fitted with 6" and 10" CL1500 compact flanges. It was found that the integrity of the production flow lines and gas lift riser could be compromised in the future due to corroding bolts. Repair work was vital to ensure the continuing integrity of the asset. Because the pipework system could not be isolated and the turret location was confined it was vital the touch time while fitting was minimized. It also led to the decision not to disturb the existing bolts so hot bolting was ruled out.

#### The Solution

Hydratight provided a simple, safe and secure solution using its MorSafe™ Flange Clamp. The Clamp design, once fitted, eliminates the possibility of leakage or blowout due to gross failure of the corroded bolts. A number of segments are designed to permanently encase the flange and each segment has a number of preinstalled 'backstops'. This patented feature allows the preloading of the Clamp without any significant Clamp load passing through the parent flange or gasket. The preload is designed to exceed the existing load in the corroded bolts so that in the event the parent bolts fail the gasket sealing stress is maintained.

The MorSafe™ clamp does not require any hydraulics or pneumatics to retain the clamp preload, nor does it increase the load on the gasket. The lightweight and compact design fits almost all flange space restrictions; it is easy to handle and fit, enabling fast and safe deployment.

#### The Project

When Hydratight's client identified the need to repair corroding bolts on an aging asset, Hydratight recommended its MorSafe™ Bolt Renewal or Reinforcement Service. After a thorough risk analysis and inspection process the client decided to fit MorSafe™ Flange Clamps to provide surrogate bolt load in the event the existing bolts failed, in order to minimize the risk of future leakage.

The Clamp was designed in accordance with ASME 8 Division 2 so that the MorSafe™ Clamp could be fitted on the flanges indefinitely.

*"A thorough test and qualification program was completed prior to installation, with the same team of qualified Hydratight technicians working on the installation for added security."*

**Paul Holland**  
Global Technical Services Leader, Hydratight

*continued on page 2*

*continued from page 1*

---

A thorough test and qualification program was completed prior to installation, with the same team of qualified Hydratight technicians working on the installation for added security. A decision was made to assign the same technicians to both testing and the installation of the Clamps in order to ensure a smoother and more efficient process, which maximized safety as the installation time in the turret was significantly reduced. Even the tooling used during the test program was subsequently shipped to the FPSO to eliminate any installation issues.

By utilizing the MorSafe™ Flange Clamp, Hydratight was able to safely extend the life of the asset until further repairs could be planned and executed, more than a year after the repair was completed.

For more information, visit [hydratight.com](http://hydratight.com).