



Neptune Completes Tension Leg Platform Repair in the Gulf of Mexico Using its Patented Underwater Dry Welding Technology

CHALLENGE

Six weld indications on a seven year old tension leg platform (TLP) in the Gulf of Mexico were identified as needing repair. After consultation with the operator of the TLP, Neptune Underwater Services (USA) recommended a timely and cost effective engineering, design, fabrication and repair solution that complied with the American Bureau of Shipping (ABS) permanent repair requirements.

OVERVIEW

Five transverse indications located at depths up to -94fsw (-29 metres) on the pontoon to base node connections and one transverse indication located on one of the tendon porches were in need of repair. Working in conjunction with the engineering firm that constructed the TLP, the Neptune team recommended application of the NEPSYS permanent repair solution to the project in situ, as neither conventional welding processes nor dry docking offered a viable solution.





Prior to the commencement of the repair work, the Neptune team performed a pre-project inspection of the damage to determine the size and scope of the repairs required. Specific measurements and video footage of the damaged areas was also obtained to ensure the unique weld habitats could be engineered and fabricated to exact specifications.

The team of eight qualified and ABS approved diver/welders used E7016 specially coated electrodes and two separate habitats to perform weld repairs to both 90° and 130° connections on the 1" and 3/4" EH36 mild steel. All repairs were completed in five days (working daylight hours only) and the entire welding procedure (3G Vertical Up) was approved by ABS as Class A, compliant with the standards set by AWS D3.6.

OUTCOME

On completion, the repairs were non-destructively tested (NDT) and examined independently utilising two different methods – magnetic particle inspection that is used to detect any surface imperfections and Ultrasonic Shear Wave Testing that is used to test the entire depth of the weld. Both tests returned results that confirmed full penetration welds of the highest standard.

The project was a milestone achievement for the Neptune team as it represented the first of its kind applied to a TLP and the first in the Gulf of Mexico to gain ABS approval. The NEPSYS process has since been added to the ABS Attending Surveyor's Training Update Program at ABS Americas in Houston, Texas.

The NEPSYS group worldwide continues to undertake research and development into the enhancement of the already proven NEPSYS solution.

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CASE STUDY