

Oceaneering Repairs Subsea Leak at Gulf of Mexico Field

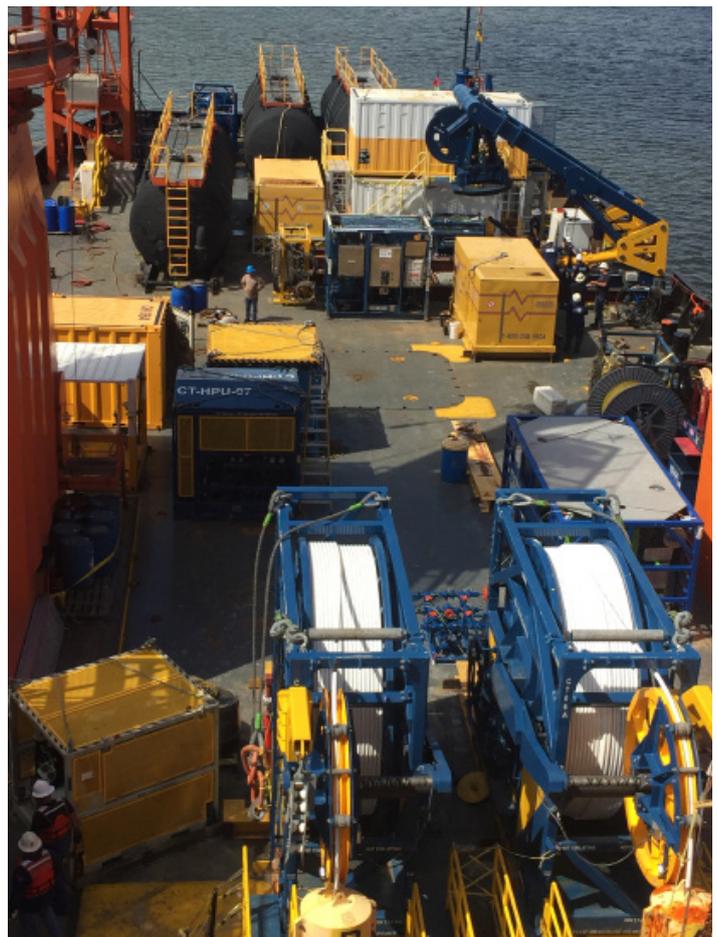
Oceaneering successfully remediates hydrates in order to bring production from the field back online

Project Overview

A client contacted Oceaneering to investigate a possible subsea production leak at a Gulf of Mexico field in 6,700 ft of water. Oceaneering determined that a jumper had failed due to movement at a pipeline end termination point, which was caused by temperature fluctuations in the field's flowlines. As a result, seawater had infiltrated the field, forcing the operator to shut in production of 60,000 b/d.

Issues

With the extent of damage initially unknown, Oceaneering's inspection and remediation plan had to account for a wide range of possible scenarios. The remediation plan also would have to address multiple intervals of hydrates in the flowlines. Hydrates, which are formed by the pressure and temperature curve in a well, can stop the flow of hydrocarbons through the flowline by forming a blockage. An operator is then forced to shut in well production, resulting in lost revenue. Oceaneering needed to ensure the hydrates didn't impede its effort to restore production.



The Oceaneering Solution

Oceaneering's inspection of the field for further damage involved multiple vessels, assets and personnel from Oceaneering's Inspection, Survey, ROV, Service, Technology & Rentals (ST&R), and Subsea Project (SPG) teams. During this campaign, Oceaneering used metrology to determine if the subsea connection point, or PLET, was in fact moving, causing the fatigue issues leading to the failure. Oceaneering installed newly designed infrastructure and remediated the hydrates to ensure these issues did not persist, allowing production to resume.

Execution Plan

Oceaneering arrived on location within a few hours of being called by the client, and started surveying and inspecting the field to determine the extent of the damage. Oceaneering next measured the distance between the subsea infrastructure using the original as-built survey as a baseline. This information was utilized by the client to fabricate new jumpers that could withstand the anticipated thermal expansion. The new jumpers were installed, and sleepers were added to the flowlines to reduce fatigue within the flowlines. The sleepers reduce fatigue by allowing flowlines to move freely, reducing negative forces on the PLET and putting less stress on the jumpers.

Oceaneering addressed the hydrates with its hydrate remediation spread, which included a vessel of opportunity, the multi-purpose service vessel HOS Iron Horse. The spread also included assets and personnel from Oceaneering business units ROV, Survey, Flowline Remediation Skid (FRS), Subsea Hydraulic Power Unit (SHPU), Coiled Tubing and associated tooling from ST&R, as well as third party providers. Oceaneering used these assets to bring the flowline pressure below the hydrate curve and evacuate the lines of any fluids, therefore removing the blockages and returning the line back to service.

Challenges

To obtain the metrology needed to fabricate the new jumpers, Oceaneering determined it needed LiDAR (Light Detection and Ranging), a remote sensing method that uses a pulsed laser to measure distances. However, the fact that

LiDAR is not an Oceaneering technology, and that only two LiDAR systems are available in the Gulf of Mexico, made it difficult for Oceaneering to access this technology. In addition to LiDAR, Oceaneering had to bring in third-party assets as needed. Oceaneering also had to rely on all of its business units' personnel and equipment to work as a team to cover any gaps.

Equipment Highlights

- » MSV Ocean Intervention II
- » MSV Ross Candies
- » MSV Cade Candies
- » MSV Cade Candies
- » MSV Iron Horse
- » MSV Connor Bordelon
- » ROV (Remotely Operated Vehicle)
- » Survey
- » Service, Technologies and Rentals
 - » Hydrate Remediation Skid
 - » Flowline Remediation System
 - » Subsea Hydraulic Power Unit
 - » Tooling
- » Engineering
- » Project Management

Results

Oceaneering's SPG and ST&R groups were successful in remediating the hydrates, allowing Oceaneering's installation group to install the new jumpers and sleepers. Oceaneering offered an all-inclusive solution to a dynamic and fluid situation in a cost-effective and timely manner. As a result, production was brought back online.

Project Highlights

Oceaneering used its expertise across several business units to evaluate the situation and come up with an effective plan of execution in a compressed timeline.