

Decommissioning Support for Field Redevelopment in the Persian Gulf

Internal Pile Cutting and Pipeline Demolition



In 2018, Oceaneering assisted in the removal of nine four-leg jackets in the Persian Gulf in preparation for new replacement jackets to be installed. The project scope included project management, tooling, and personnel. The project's location and the importation of equipment required significant planning, vendor management, and mobilization efforts. Oceaneering was tasked to complete:

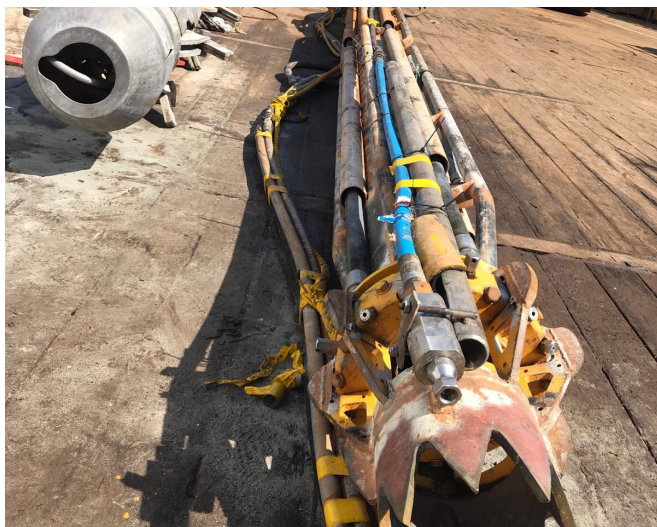
- » 36 off 30-in/76.2-cm-diameter soil plug removal to 9.8 ft (3 m) below the mudline
- » 36 off 30-in-diameter pile cutting approximately 3.3 ft (1 m) below the mudline
- » Pipeline demolition ranging in diameter from 9 in to 40 in (22.8 cm to 101.6 cm)
- » Precision pipeline cutting
- » Dredging operations

Issues

The customer needed cutting and dredging solutions for several scenarios, and required an internal dredging and cutting option for soil plug removal and pile cutting, as well as a solution for pipeline demolition for a range of pipe diameters. Finally, precision cutting and external dredging options were also needed to complete the full scope of work.

The Oceaneering Solution

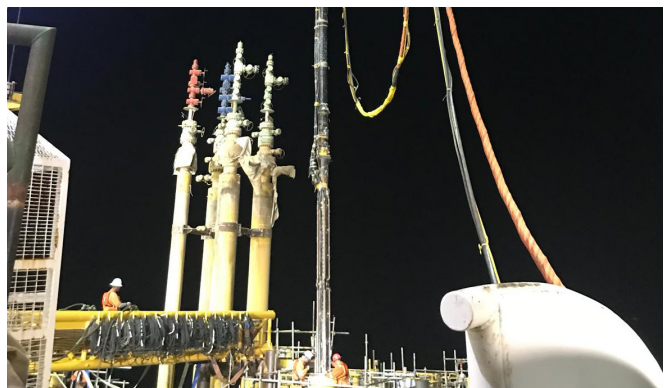
To achieve the scope, Oceaneering deployed multiple tooling spreads. An airlift stinger and compressor system was deployed for soil plug removal, while an internal cutting tool (ICT) system was deployed to complete pile cutting.



Both 7 Te and 20 Te shear spreads were used to complete pipeline demolition. Additionally, 16-in to 48-in (40.6-cm to 121.9-cm) diamond wire saws (DWSs) were used for precision cutting, and a grapple was provided for pipeline recovery. Finally, a 6-in (15.24-cm) diver dredge was deployed for any external dredging requirements. A six-man crew operated two tooling spreads across two heavy lift barges, and additional technicians were deployed to complete the demolition, cutting, and dredging work as required.

Execution Plan

The project execution plan was to deploy from two heavy lift barges, each with an ICT system. Pile cutting was to be completed through internal dredging to the required depth before using the ICT system to complete the internal cut. If there was any issue with completing an internal cut, the diver dredge could be used to clear space externally around the pile before the DWS performed the external cut.



Additional pipeline demolition and platform preparation tasks were to be completed, as required, from a range of other vessels. As pipe sections were cut, a grapple could be used to retrieve the cut section.



The project required exceptional organization of tooling and personnel, as well as multiple mobilizations and de-mobilizations. These actions frequently had to be completed with little warning due to changing requirements

in the field. Operations were supported from multiple locations including the UK, the US, the UAE, and Saudi Arabia. Tooling and personnel were sourced from a global Oceaneering pool of resources. Platform preparation and pipeline demolition began in March 2018, with pile dredging and ICT operations beginning in April 2018. These pile dredging and ICT operations were completed in August 2018, and pipeline demolition was completed in November 2018.

Challenges

In two piles, grout was discovered that had not been accounted for. Oceaneering quickly solved the problem by deploying a diver dredge and a DWS to the affected piles. The dredging created enough space for divers to correctly locate the DWS, which was used to cut both piles.



Oceaneering also faced challenges with the supply, security, and quality of grit for the ICT system. This grit was being provided from a third party based in Saudi Arabia. Oceaneering completed multiple inspections of the third party's base and identified areas of improvement in the sifting process. Oceaneering operations and supply chain teams communicated their concerns with the third party, and, consequently, multiple improvements were made, and the supply, security, and quality of the grit were greatly improved.

As offshore requirements shifted, the client frequently altered its schedule, and Oceaneering was often given minimal notice that a change was about to happen; therefore, Oceaneering teams had to be flexible, adaptable, and quick thinking to meet client expectations.

Both tooling and personnel movements had to be managed rapidly and accurately.



Results

Out of 36 piles, 34 were dredged and cut internally as planned, with the remaining piles cut by the DWS. These pile-cutting operations were completed ahead of schedule. More than 600 pipeline demolition cuts were completed, ranging in diameter from 9 in to 40 in (22.86 cm to 101.6 cm) at an average cutting rate of 15 to 20 cuts per hour. Additional precision cuts were completed using a range of DWSs, and near-continuous operations of 6-in (15.24-cm) diver dredges were conducted from three vessels for the duration of the project.

Project Highlights

- » Efficient operations led to offshore operations completing 1 month ahead of schedule.
- » Rapid mobilization of 2 toolings spreads from a global fleet.
- » Middle East based team developed to support operations.
- » Multiple successful mobilizations and demobilizations of personnel and equipment.
- » Job completed in challenging conditions (40 °C+ temperatures offshore).



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