

Oceaneering delivers subsea pig launcher solution

Project Overview

A customer contracted Oceaneering to design, build, and qualify a deepwater, reusable subsea pig launcher and associated support hardware to be used in the event that maintenance pigging of single-tieback flowlines is required.

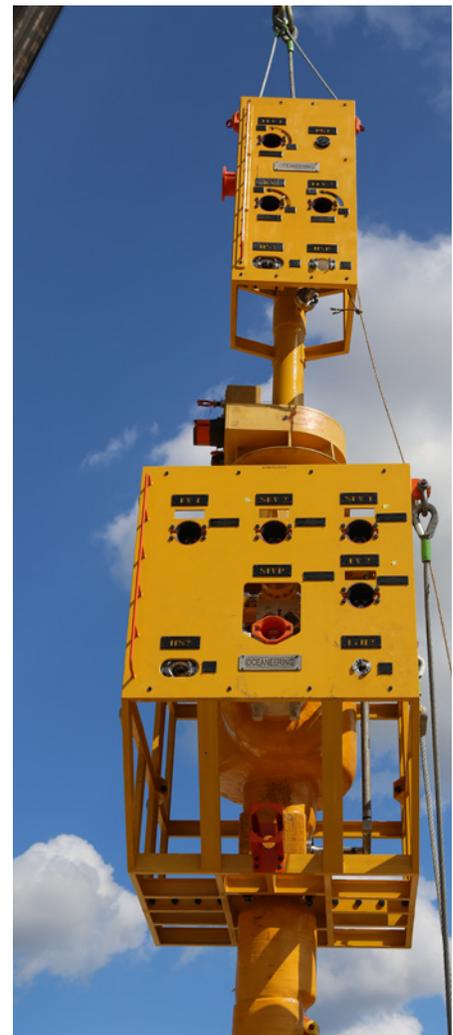
The pig launcher the customer requested is capable of launching at least five maintenance pigs annually. For robustness and pigging philosophy flexibility, the launcher was qualified using three different styles of pig designs.

The Oceaneering Solution

The solution enhanced previously successful designs while integrating the customer's free-issued equipment to reduce cost and improve schedule. The integrity-critical aspect of the project scope was achieved by adding a saver sub module (SSM). The module provided a permanent interface and a secondary isolation valve between the flowline end termination (FLET) and pig launcher.

Additionally, the project scope included a wet parking skid that provides an intermediate subsea storage facility and it is the first piece of hardware deployed during installation. The skid supports the landing and storage of the SSM while the pressure cap from the existing FLET is removed. Upon successful removal, the wet-parked SSM can be installed onto the production FLET.

The designed solution also considers transportation and installation requirements. The launcher and hardware can be safely shipped from Houston and can be installed using standard offshore rigging under potential rough sea conditions. The subsea interfaces are based on common ROV tooling for simple and flexible subsea installation and operations.



Execution Plan

Oceaneering was awarded the contract in early March 2015, followed by kicking off detailed design, procurement, and fabrication. The customer's free-issued equipment, including connectors, piping, and valves, was delivered to the Oceaneering Houston facility in multiple stages from July to November 2015. Fabrication of the pig launcher was completed at Oceaneering and vendor locations through August 2016. Factory Acceptance Testing (FAT), System Integration Testing (SIT), and Qualification Testing were completed in October 2016.



The qualification process was completed over a three-week period at Oceaneering's Houston site. The testing required one week of setup, the delivery and positioning all equipment, four days of customer-witnessed testing (including demonstrating various lifting conditions), three test pig runs, and flushing operations. The first pig test was performed using a plain, foam pig. The second test used a foam-scraper pig which is more difficult to launch but capable of removing more stubborn pipeline deposits. The final qualification test was performed using a multi-disk scraper pig, which was the most difficult to launch due to its aggressive, high-stiffness design. Testing was followed by another week of disassembly and shipment back to facilities for a final touch-up.

Challenges

- » Procurement and delivery of valves from a key supplier

- » Identification of suitable fabrication vendor
- » Meeting demands of complex engineering requirements
- » Labor-intensive assembly and testing regiment

Equipment Highlights

- » Launcher module (pig launcher)
- » Launcher module stand (launcher module transportation, topside pig loading, deployment, testing)
- » Saver sub module (SSM)
- » SSM transport and test stand
- » Wet (subsea) parking skid
- » Pressure caps (x 2)
- » Ground and test support equipment
- » SIT (pig launch demo)

Results

A versatile, integrated Oceaneering execution team provided constant communication and supported fast decision making to maintain the tight delivery schedule. Transparency and clear communication between Oceaneering and the customer enabled the team to overcome obstacles. The introduction of this deepwater pig launcher solution allows maintenance pigging of existing single tie-back flowlines and can help customers simplify the planning and execution of new field layouts.

