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Conductor Pre-Installation, Deepwater Brazil

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Abstract

This paper presents the requirements that led to the successful implementation of a subsea hydraulic hammer for installation of conductors offshore Brazil.

The Parque das Conchas development required conductors both for wells and for the two Artificial Lift Manifolds (ALM). For the 36 inch well conductors it was important that the conductors were installed off the rig critical path and for the 48 inch ALM conductors the critical issue was the accuracy of the conductor height for subsequent manifold placement. The solution was to install the respective conductors using a subsea hammer deployed from an Anchor Handling Vessel (AHV).

The ALM templates were transported offshore vertically on the AHV's A-frame, submerged and rotated to a horizontal position, and deployed to the seafloor. Once the templates were correctly positioned, the well and ALM conductors were transported offshore on a specially outfitted barge. The conductors were launched from the barge while connected by a line to the anchor handler. Then they were lowered and allowed to self-penetrate into the seabed. Once all the conductors were installed, they were hammered to depth using a subsea hydraulic hammer. Both ALM templates were placed accurately in position within 1.5 deg heading and 0.5 m in the horizontal plane and all conductors were successfully installed within verticality and height tolerances.

The campaign included many industry firsts, in water depths ranging between 1650 and 1920m in relatively harsh met-ocean conditions. The industry firsts include:

- Vertical template transportation/insertion through water plane followed by horizontal lowering from AHV
- Deepwater hydraulic hammer spread deployed and operated from AHV
- A new depth record (1920 m water depth) for deepwater hammering.

With the installations in Brazil the operating envelope of deepwater conductor installation with a hydraulic hammer has been significantly increased and provides a viable alternative to conductor installations with a deepwater drilling rig.

Introduction

The BC-10 block, operated by Shell Brasil E&P, is located in the Campos Basin, off the coast of Brazil, approximately 120 km SW of the city of Vitoria in Brazil (**Fig. 1.**). In late 2007 operations commenced to install the facilities and wells for the Parque das Conchas project; a cluster development of discovered fields known as Ostra, Abalone and Argonauta (**Fig. 2.**).

The Operator was investigating solutions for the installation of conductors that could receive a mud line Electrical Submersible Pump (ESP) module that provides the artificial lift for the field. The conductor size had to be 60 m long with an inside diameter (ID) of 45 inches. Another complicating factor was that these conductors had to be very accurately installed through the ALM templates with respect to stick-up above mud line (**Fig. 3 and 4**). It was realized that any opportunity to reduce the use of rig time, both in terms of cost and availability, would add value to the project; the proposed off-line installation of both the ALM and well conductors was seen as an opportunity to do so.

In view of the high global utilization rate of deepwater drilling units, InterMoor was investigating where there could be opportunities to save rig time based on innovative offshore solutions. Performing installation operations from the 'Back of the Boat' (the Contractor's area of expertise) could yield cost effective solutions for reducing rig time utilization for the Operator.

Jointly, the Contractor and Operator developed installation concepts that satisfied both the Parque das Conchas conductor installation requirements and utilized safe offshore deployment procedures.