

MPD Reduces Drilling NPT, Increases Wellbore Stability in Large-Hole Sections of Slanted Well, Gulf of Mexico

Operator uses rotating control device to initiate managed pressure drilling operations in large-hole sections of deepwater field development project

CHALLENGE

Drill two large-hole sections in a 65° slanted deepwater well.

SOLUTION

Use the @balance Speed sealed rotating system (SRS) in an X2 large-ID housing and managed pressure drilling (MPD) equipment and software to handle expected high flow rates in the large-hole sections.

RESULTS

- Successfully completed MPD operations in two large-hole sections.
- Controlled borehole instability and heavy mud losses.
- Reduced total drilling NPT.



Improve drilling and tripping operations with MPD and RCD technology

An operator needed to drill two large-hole sections in a deepwater well in the Gulf of Mexico. To successfully drill the well from the tension leg platform, the operator needed to use MPD while drilling the 14.5-in × 17.5-in [36.8-cm × 44.5-cm] and the 12.25-in × 14.75-in [31.1-cm × 37.5-cm] sections. These two sections required a large-ID RCD to enable the use of MPD techniques. In addition, the rotating control device (RCD) needed to withstand a 1,200-galUS/min [276-m³/h] flow rate and the cuttings load resulting from a 100- to 200-ft/h [30.5- to 61-m/h] ROP.

Use the @balance Speed SRS to overcome MPD drilling obstacles

To meet objectives for the well, M-I SWACO recommended deploying the @balance Speed SRS for the first time in the deepwater field development project. To handle the drilling challenges expected from the well, the operator used the @balance Speed SRS in combination with M-I SWACO drilling fluids, solids control equipment, a specialized MPD manifold integrated into the rig's circulation system, and a specialized MPD control software developed specifically for high flow rates. The @balance Speed SRS enabled MPD operations in the two large-hole sections.

It took 6 drilling hours to drill the 662-ft [202-m] of the 14.5-in × 17.5-in section. It took 22 drilling hours to drill the 2,034-ft [620-m] of the 12.25-in × 14.75-in section. Each section was drilled with a single SRS. After completing both sections, the SRS showed minimal signs of wear. Furthermore, the @balance Speed SRS did not experience any issues with rotations exceeding 160 c/min. The two sections were successfully drilled to their planned total depths without incident.

Solved borehole instability, controlled heavy mud losses, and reduced total drilling NPT

The combined use of the @balance Speed SRS and MPD equipment and software prevented mud loss, minimized drilling NPT, and stabilized the borehole. The design of the @balance Speed SRS enabled hardware changeout in less than 30-min operational time, which reduced the total drilling NPT. Also, the @balance Speed SRS exceeded expectations while handling the high flow rate and cuttings load resulting from the high ROP.

As a result of the successful MPD operation using the @balance Speed, an X2 large-ID housing is permanently installed on the platform.



Use of the @balance Speed SRS resulted in reliable well pressure and fluid control during MPD operations.