**Saka Indonesia Pangkah Improves On-Bottom ROP by 130% While Drilling High-Angle S-Type Well**

PowerDrive vortex RSS enables safer drilling in environment known for stick/slip and erratic torque risks, Ujung Pangkah field, offshore Indonesia

**CHALLENGE**
Drill an S-type well to TD in a drilling environment with known high-erratic torque and stick/slip risks.

**SOLUTION**
Use the PowerDrive vortex* powered rotary steerable system, comprising a PowerDrive Xceed* ruggedized rotary steerable system and a PowerPak* steerable motor, to mitigate known risks while improving ROP.

**RESULTS**
- Increased ROP by 130% compared with ROP of previous runs and 154% compared with the well plan.
- Improved drilling efficiency, nearly doubling feet per circulating hour.

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**Improve ROP while drilling an S-type well through a high-risk environment**
Saka Indonesia Pangkah needed to drill an S-type well offshore Indonesia in a difficult environment. The well (UPB-12) was planned to be the first S-type well to drill to 9,618-ft TVD (Ngimbang carbonate formation) with a 61° inclination in Ujung Pangkah field. It was also going to be the field's deepest well—nearly double the depth at TD. However, the drilling environment posed high erratic torque and stick/slip risks.

**Mitigate risks using a customised PDC bit and an RSS**
Schlumberger suggested using the PowerDrive vortex system to mitigate these risks while improving ROP and reducing the friction factor. The PowerDrive vortex system is made up of a PowerDrive Xceed RSS and a PowerPak motor and is extremely reliable in abrasive, hot, and high-shock environments.

Saka Indonesia Pangkah planned to use the PowerDrive vortex system, combined with a customized PDC bit as torque risk prevention, to drill the 8½-in section of the well. The plan entailed dropping the angle from 43° at 7,944-ft MD (5,685-ft TVD) to vertical with a 2.6° dogleg severity until planned TD at 11,900-ft MD (9,618-ft TVD).

**Increased ROP 130% compared to the ROP achieved by the previous BHA**
Drilling torque ranged from 5,000 to 7,000 ft.lbf with a consistent WOB throughout the process. The stick/slip ratio was reduced to a maximum of 100%, which enables the operator to mitigate stick/slip even when using a more aggressive bit. The average friction factor during rotation was reduced by 18% from 0.28 to 0.23.

By using the PowerDrive vortex system, Saka Indonesia Pangkah was able to increase ROP by 130% compared with ROP from a standalone BHA and 154% compared with the well plan. The PowerDrive vortex system significantly improved drilling efficiency, saving rig time and reducing overall cost.

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"The PowerDrive vortex system is a proven technology that benefits the drilling process while encountering high torque in high-angle, S-type wells."

Indan Handono  
Drilling Manager  
Saka Indonesia Pangkah

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