GaugePro Echo near-bit reamer eliminated a 25-hour trip and enabled casing run in unstable formation

An operator challenged by unstable shale intervals and subsequent cementing issues in an offshore Norwegian field needed a more efficient way to ream the pilot hole and improve casing operations.

Baker Hughes, a GE company (BHGE), recommended its new **GaugePro™ Echo digital on-command reamer**. The reamer, with its near-bit placement feature and unlimited digital activation cycles, eliminates a reaming trip by drilling the rathole within a short distance of total depth (TD). The tool operates independently of pump flow rates and sends back real-time information including blade status and position, hydraulic oil pressure, temperature, and vibration, and includes a triple failsafe system to ensure it can trip out of hole. When used with an **AutoTrak™ rotary steerable system bottomhole assembly (BHA)**, up to three reamers can be added and individually activated to provide flexibility while maintaining directional control in challenging formations.

This operator implemented a BHA consisting of the BHGE GaugePro Echo digital reamer, an AutoTrak rotary steerable system, a flexible stabilizer, and **OnTrak™ MWD service**.

A standard ball drop under-reamer was placed 164 ft (50 m) above the bit and was used to open the 12-¼ in. hole to 14-½ in. After reaching TD, the ball drop under-reamer was deactivated and the BHA was pulled back until the GaugePro Echo reamer blades were in the previously opened 14-½ in. hole. The GaugePro Echo reamer was digitally activated via downlink, and under reaming of the rathole commenced. Throughout the under-reaming operation, tool performance and confirmation of opening diameter was monitored in real time.

Drilling parameters were optimized throughout the rathole reaming operation in response to erratic torque values encountered in the unconsolidated rathole interval. The original TD was also successfully extended by drilling another 6.5 ft (2 m) while under reaming with the GaugePro Echo.

Challenges

- Unstable formation in 12-¼ in. section mitigated by under reaming to 14-½ in.
- Cement and hole stability issues in longer ratholes, requiring a rathole distance of less than 33 ft (10 m)

Results

- Reduced rathole by 84% from 164 ft (50 m) to 26 ft (8 m)
- Eliminated a dedicated under-reamer run
- Saved an estimated 25 hours rig time and $350,000 USD

After reaching the revised TD, the GaugePro Echo was digitally deactivated and the BHA was tripped out of the hole. The 9-⅝ in. casing liner was then successfully run to TD and cemented in place.

By using the digitally-activated GaugePro Echo reamer near the bit in this unstable formation, the operator was assured of the tool's operation while drilling the final rathole. Casing was set, and the typical follow-up dedicated run was eliminated, saving the operator an estimated 25 rig hours and USD $350,000 USD.

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