Engineering Center Optimizes Drilling to Save USD 18 Million in Deepwater GOM Well for Shell

Cohesive drilling solution delivers 26,678-ft well in 18 days less than AFE

**CHALLENGE**
Drill each hole section shoe to shoe in one run, including a uniquely sized 10¼-in section, in the challenging HPHT environment of Desoto Canyon while optimizing ROP and ensuring a high-quality, clean wellbore.

**SOLUTION**
Use the fully integrated, multidiscipline petrotechnical engineering center for prejob planning, BHA design, and job execution, assembling PowerDrive X6* RSS, MLWD services, Rhino* integrated borehole enlargement systems, PDC drill bit, and drilling fluids with prejob simulation and analysis of the entire drilling system.

**RESULTS**
- Delivered well 18 days ahead of plan, saving approximately USD 18 million off AFE.
- Optimized drilling with an integrated team specialized in drilling, MLWD, bits, reamers, and fluids.
- Drilled each section of the 26,678-ft well to TD in one run with zero NPT, avoiding midsection BOP trips.

**Plan HPHT exploration well in deepwater Gulf of Mexico**
Shell planned to optimize drilling performance in the deepwater well, located in the Eastern Gulf of Mexico. With scarce offset data, Schlumberger coordinated a cohesive multidiscipline team for planning and execution of the high-risk project that faced an HPHT environment up to 340 degF, salt avoidance, and TVD greater than 25,000 ft.

**Analyze BHA components and fluid systems for optimal performance**
For BHA optimization, i-DRILL* engineered drilling system design was used for predictive modeling to simulate BHA tendencies and stability for each of the BHAs. The team analyzed potential for stick/slip and shock and vibration (S&V) and BHA behavior in multiple scenarios given the unknown environment. VIRTUAL HYDRAULICS† software—a proprietary integrated suite of programs from M-I SWACO, a Schlumberger company—predicted the swab and surge pressures in the wellbore as well as ECD and provided a hole cleaning overview.

**Saved USD 18 million and 18 days off AFE**
The six hole sections were each finished in a single run without tripping up for regulatory BOP tests, tool failure, or hole conditioning, resulting in zero NPT. The 26,678-ft vertical well was drilled with minimal stick/slip and S&V and in great condition for logging evaluation and casing runs. Schlumberger drilled the well in 18 days less than AFE, saving Shell approximately USD 18 million.

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