



Customized BaraXcel™ Fluid System Saves Operator More Than USD 4M in Rig Time

BAROID FLUID ENABLES OPERATOR TO DRILL DEEPWATER WELL 10 DAYS FASTER THAN PLAN

OFFSHORE CAMPECHE, MEXICO

CHALLENGE

Provide an optimal fluid for successfully drilling a deepwater well with an 80° angle, which was expected to have hole-cleaning and lost-circulation issues related to its narrow pore pressure/fracture gradient window

SOLUTION

Organophilic clay-free BaraXcel™ HP NAF system, which was specifically optimized for the expected temperatures and drilling conditions

RESULTS

- » Provided optimal hole cleaning and ECD control
- » Drilled well 10 days ahead of time, with no NPT
- » Saved operator approximately USD 4.3 million

OVERVIEW

In 2016, an operator in the Gulf of Mexico planned to drill a deepwater well to a measured depth (MD) of 4,554 meters (14,951 feet). The planned true vertical depth (TVD) was 3,241 meters (10, 633 feet). The well would reach a maximum angle of 80° in the effort to reach the target reservoirs.

CHALLENGE

The well required drilling in a narrow pore pressure/fracture gradient window. Effective hole cleaning was critical to success. The operator also wanted to maximize rate of penetration (ROP) without risking excessive equivalent circulating densities (ECDs).

New reservoir information gained from drilling this well would be used to update and optimize the field development strategy. Prior wells had encountered hole-cleaning and lost-circulation issues.

SOLUTION

Extensive testing was performed on the Baroid organophilic clay-free BaraXcel™ high-performance (HP) non-aqueous fluid (NAF) system to ensure that it could perform as specified in the difficult well.

The BaraXcel HP NAF system was tested at various temperatures to simulate the range of downhole, mudline, and riser temperatures. This included analyses performed before and after hot-rolling the fluid at 65°C (149°F) for 16 hours, as well as at 4°C (39°F) and at atmospheric pressure. The FANN® 75 high-pressure/high-temperature (HPHT) rheometer was used to evaluate rheological properties under simulated downhole conditions.

Optimal hole-cleaning parameters were determined through modeling with the Baroid Drilling Fluids Graphics (DFG™) hydraulics software. Multiple iterations were performed to account for expected ROPs, flow rates, mud densities, and cuttings loading.

This modeling resulted in a customized sweep protocol, including a train of pills designed to cause turbulent flow in the annulus. This would facilitate cuttings transport and minimize the tendency for cuttings bed accumulation.

During drilling operations, the Baroid lab, tech, and field teams closely monitored fluid properties and treatment concentrations to ensure that the BaraXcel HP NAF system remained in optimal condition.

**USD 4M
SAVED
IN RIG TIME**



RESULTS

The engineered BaraXcel HP NAF system delivered outstanding hole cleaning and ECD control, allowing the well to be drilled 10 days faster than planned, with zero nonproductive time (NPT). The estimated savings on this deepwater operation was USD 4,342,000.

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