BaraECD® NAF Delivers Consistent Wellbore Stability in Deepwater Well, Saving 24 Days of Rig Time

HIGH-PERFORMANCE FLUID SYSTEM OPTIMIZES DRILLING OPERATION

WALKER RIDGE, DEEPWATER GULF OF MEXICO

HOLE CLEANING AND SAG ISSUES ON OFFSET WELLS RESULT IN ABANDONMENT

Two deepwater wells drilled in the same field by the same operator encountered serious hole cleaning and barite sag issues, directly related to the large hole size, high deviation, and bottomhole temperature (BHT). The wells – drilled using a competitor’s fluid system – were ultimately abandoned.

For the third well, a re-drill operation, the operator awarded Baroid the drilling fluid services. This well successfully reached total depth (TD), using the high-performance BaraECD® non-aqueous fluid (NAF) system.

Building on that success, the operator wanted Baroid to design a BaraECD system that would help meet the challenges of the proposed fourth well: four large-bore intervals, including three intervals with a maximum deviation of 59°. The planned true vertical depth (TVD) was over 28,000 feet (8,534 meters) with a measured depth (MD) over 30,000 feet (9,144 meters). The BHT was expected to exceed 200°F (93°C). These were the same conditions that caused hole cleaning, barite sag, and wellbore stability issues on the first two wells.

CUSTOMIZED NAF SYSTEM PROVIDES LOW ECD, ZERO SAG, AND STABLE WELLBORE

The Baroid technical team recommended using the high-performance BaraECD NAF system to achieve effective hole cleaning and prevent barite sag. The system is proven to minimize equivalent circulating density (ECD) while drilling. Its fragile gel structure provided excellent suspension during static conditions, helping to prevent barite sag.

The formulation was designed to maintain consistent and predictable properties, achieved with precise additive concentrations and optimized oil/water ratios (OWRs). The drilling fluid program incorporated well-specific properties and practices for each interval to ensure that the desired results were obtained throughout the well.

The BaraECD system performed exactly as predicted. The rates of penetration were higher than expected, losses while drilling were negligible, and there were zero indications of barite sag.

The fluid rheology and OWR values were managed closely to provide the best possible hole cleaning without negatively impacting hydraulics.
WELL REACHES TOTAL DEPTH 24 DAYS AHEAD OF PLAN

The well reached TD successfully, 24 days faster than the operator’s well plan estimate. The final well depth was 30,853 feet (9,404 meters) MD and 28,325 feet (8,633 meters) TVD.

The reliability and consistency provided by the high-performance BaraECD system allowed for the optimization of other aspects of the drilling operation, resulting in general improvements to efficiency.

There were several known loss zones, particularly in the first interval. Losses while drilling the four intervals were negligible (221 bbl), even though the drilling fluid was overbalanced in an effort to avoid wellbore stability issues seen on offset wells. The ECD averaged about 0.5 ppg over surface mud weight throughout the well.

The daily cost of operating the deepwater rig was estimated at USD 1 million. Reaching TD 24 days ahead of plan saved the operator approximately USD 24 million. Baroid was awarded two additional rigs based on this outstanding performance.