



Operator Saves USD 180K with New Drilling Lubricant in 8½" Extended Well Section

BARALUBE® W-1021 ENABLES SINGLE BHA RUN BY REDUCING TORQUE AND ELIMINATING TRIP TO CHANGE DRILL PIPE

OFFSHORE QATAR

CHALLENGES

- » Drill an extended well section with a complex profile without exceeding torque limits
- » Optimize fluid performance to avoid loss
- » Stabilize wellbore to allow comprehensive pipe conveyed logging (PCL) runs

SOLUTION

BaraLube® W-1021 drilling lubricant selected to:

- » Enhance lubricity of LSND fluid system
- » Improve fluid loss performance
- » Provide necessary wellbore stability for logging operations

RESULTS

- » Achieved superior wellbore stability and flawless fluid performance throughout the interval
- » Eliminated a trip to change drill pipe from 5-in. to 4-in. to overcome expected torque limitation
- » Ran successful PCL logs due to the excellent hole condition
- » Enhanced filtration control property of the mud system by over 30 percent, without additional chemical treatments
- » Saved operator 72 hrs. of rig time, equivalent to approximately USD 180K

DRILLING HIGH-RISK RESERVOIR WITHIN TORQUE LIMITS

A major operator offshore Qatar planned to drill an 8½-in. limestone-based reservoir of over 21,000 ft. (6,400 m) in length with a water-based drilling fluid. The section contained shale incisions in a convoluted well trajectory and long horizontal section. The primary goal of the interval was to drill to the target depth without exceeding the maximum torque limits.

Shale inhibition, high torque, and stick and slip values were identified as key risks when drilling offset 8½-in. intervals. On previous wells, maximum torque limits had been reached with the 5-in. drill pipe, necessitating a trip out of the hole to change the drilling assembly to include 4-in. drill pipe in order to drill successfully to the section total depth (TD).

NEW LUBRICANT TECHNOLOGY REDUCES FLUID FRICTION AND LOSS

The Halliburton Baroid Technical Team recommended the use of BaraLube W-1021 to enhance the lubricity of the low-solids non-dispersed (LSND) fluid system programmed for the interval. Formulated with 3% v/v liquid lubricant, laboratory testing confirmed that the inclusion of BaraLube W-1021 in the LSND fluid provided an additional 30 percent reduction in the fluid's coefficient of friction.

BaraLube W-1021 is a micro-sized capsule containing customized lubricating oil, which is released upon exposure to friction and shear. In addition to its biodegradability and acid solubility, BaraLube W-1021 reduces fluid loss without affecting rheology.

Adding BaraLube W-1021 treatment to the circulating system is recommended to be performed through premixed additions. A concentrated pill containing 40 lb/bbl BaraLube W-1021 was prepared and bled into the active system over two full circulations. Additional concentrated pills were mixed and bled into the active system to maintain a final concentration in the active system of 12 lb/bbl (equivalent of 1.4% v/v oil). Significant torque reduction was observed while drilling, which helped the operator to reach programmed depth without issues.

DRILLING OBJECTIVES MET IN A SINGLE RUN

The 8½-in. interval was drilled with stable fluid properties to reach section TD in just one run. The reduction in torque eliminated any additional trips.

The following benefits were realized with the new lubricant technology:

- » Encapsulated lubricant ensured targeted delivery of torque reduction
- » Superior hole conditions delivered, enabling PCL runs to be completed successfully
- » No need to change out drill pipe, saving 72 hours of rig time, worth an estimated USD 180K