BaraECD® High-Performance Fluid System Enables Operator to Successfully Drill MPD Well

FLUID SYSTEM EFFECTIVELY CONTROLS ECD IN WELL WITH NARROW DRILLING MARGIN

GULF OF MEXICO

CHALLENGE

Narrow pore pressure/fracture gradient drilling window resulted in the need to:

» Minimize ECD and fluid losses in the depleted sand formation
» Successfully get the production liner to the bottom of a tight-tolerance hole

SOLUTION

BaraECD® high-performance fluid system, along with WellSET® lost circulation treatment, in order to:

» Provide low, controlled ECD
» Achieve adequate hole clearing and resistance to barite sag
» Minimize stress on the formation due to pressure cycles
» Design an LCM treatment to mitigate potential losses in the depleted sand formation

RESULTS

» Successfully drilled well to total depth, with no losses experienced in the depleted sand
» Achieved average ECD numbers between 0.55 lb/gal and 0.6 lb/gal, a reduction of 0.309 lb/gal compared to conventional invert emulsion fluid systems

CHALLENGE

On the Ensco 82 rig located in the Gulf of Mexico in 2012, the operator was drilling a managed-pressure-drilling (MPD) well in a depleted sand formation in the South Timbalier field. Given the narrow pore pressure/fracture gradient drilling window, the challenge was to minimize equivalent circulating density (ECD) and fluid losses in the depleted sand formation, while getting the production liner to the bottom of a tight-tolerance hole

SOLUTION

Due to the narrow drilling window, Baroid engineers recommended the use of a BaraECD® high-performance internal olefin-based fluid system. The BaraECD fluid system was engineered to provide low, controlled ECD in wells with narrow drilling margins, while also providing adequate hole clearing and resistance to barite sag.

The BaraECD fluid system was able to reduce the ECD that had been experienced in similar wells by 20–50 percent, allowing the operator to minimize stress on the formation due to pressure cycles. No losses were reported while drilling, running the 5-inch liner, or circulating prior to the cementing job.

In addition to the BaraECD fluid system, Baroid’s engineered WellSET® lost circulation treatment was used to design a lost circulation material (LCM) treatment to mitigate potential losses in the depleted sand formation. A recommended blend of lost circulation materials was tested in the lab and then applied to the fluid. No fluid losses were encountered in the sand at any point during the drilling of the well.

RESULTS

Following the use of the BaraECD system, the average ECD numbers observed were between 0.55 lb/gal and 0.6 lb/gal, well below the 1.0 lb/gal ECD requirement. This marked an ECD reduction of 0.309 lb/gal compared to conventional invert emulsion fluid systems. The well was successfully drilled to total depth, with no losses experienced in the depleted sand, or during the liner run or while circulating prior to the cement job.

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