

BRINEDRIL-N[®] and BARADRIL-N[®] Systems Successfully Drilled Longest Offshore Well on Location

OFFSHORE, UAE

CHALLENGES

Reentering an existing well to create the longest lateral ever drilled in the target formation. Challenges included:

- » Drilling in low-pressure carbonate reservoir formation that was very susceptible to fractures and losses
- » Recommending a fluid that could provide filtration control and combat seepage losses while maintaining minimum static and circulating densities

SOLUTIONS

Baroid proposed the BARADRIL-N[®] and BRINEDRIL-N[®] systems to deliver several benefits:

- » Temperature stability
- » No additional lubrication
- » Cost-effective time savings

RESULTS

- » Drill-in fluid systems enabled operator to access target zone and to drill longest lateral in formation
- » Operator drilled sections successfully without any fluid-related issues
- » BARADRIL-N fluid performance was maintained, despite four days with no circulation

OVERVIEW

An offshore field in the UAE has been extensively developed with advanced techniques, including extended-reach drilling (ERD). Considerable experience has been gained with laterals up to 3,000 feet (914 meters) long.

An operator planned to reenter an existing well to drill two sections to create the longest lateral ever drilled in the formation. If successful, this was intended to set a precedent for future field development. The reservoir was a depleted carbonate formation that presented many challenges associated with hole stability, fractures, and losses.

The operator challenged Baroid to provide a fluid that could provide excellent filtrate control and the capability to combat seepage losses while maintaining minimum static and circulating densities.

NON-DAMAGING RESERVOIR DRILL-IN FLUIDS HELP CUSTOMER REALIZE SIGNIFICANT OPERATIONAL EFFICIENCIES AND COST SAVINGS

Baroid implemented its Technical Process with extensive testing to customize fluid solutions capable of meeting and surpassing the customer-specified design targets. As a solution, Baroid proposed two non-damaging water-based reservoir drill-in fluids for this water injector well: BRINEDRIL-N[®] fluid was proposed for the upper section to minimize the solids loading while achieving the required density of 11 lb/gal (1.31 SG), and BARADRIL-N[®] fluid was proposed for the lower section at a density of 9.5 lb/gal (1.14 SG).

BARADRIL-N and BRINEDRIL-N fluids are clay-free, acid-soluble, water-based reservoir drilling fluids that are customized to provide effective fluid loss control and reliable wellbore stability by using sized BARACARB[®] bridging agents. The brine base of BRINEDRIL-N fluid gives access to higher densities while maintaining a low-solids loading. BARADRIL-N fluid is a low-density drilling fluid system suitable for low-pressure gradients.

The fluids demonstrated full functional requirements in the field: an 8.5-inch section over 7,000 feet (2,134 meters) long was drilled successfully with a buildup angle up to 82°. Secondly, over 2,000 feet (610 meters) of a 6-inch section was drilled directionally, landing at 90.5°. All of this was achieved without any fluid-related issues while drilling, tripping, liner running, or cementing operations.

Time Savings
7.5 DAYS

At over 9,000 feet (2,743 meters) long, this was, at the time, the longest lateral drilled into this formation.

During drilling of the 6-inch section, the top-drive system (TDS) failed and the BARADRIL-N fluid was left static in the well for four days at 235°F (112°C). After circulation, all fluid properties were confirmed to be in specification with no solids settling and very low fluid loss values. No additional lubrication was required to successfully run the 7-inch liner, indicating a gauged hole and thin filter cake.

DRILL-IN FLUID SYSTEMS CREATE ECONOMIC VALUE

At over 9,000 feet (2,743 meters) long, this was, at the time, the longest lateral drilled into this formation.

The BRINEDRIL-N and BARADRIL-N fluid systems demonstrated their value by not only successfully accessing the target zone, but also by maintaining condition during an unplanned extended static period.

Time savings of 7.5 days in the upper hole sections were achieved, thanks to the implementation of these fluids; frequent trips for bit and/or downhole tools were experienced while fluids showed excellent downhole stability despite the prolonged static periods. Forty percent savings of the planned cost per barrel were also achieved. The customer recognized this success, and now plans to create even longer ERD lateral sections in future wells.

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