

Case History

Packer Fluids

Innovative Use of N-SOLATE® Packer Fluid in Gulf of Mexico Drilling Operation

Location: Gulf of Mexico

OPERATOR'S CHALLENGE – An operator in the Gulf of Mexico had previously experienced lost circulation and high equivalent circulating densities (ECD) while drilling with a synthetic-based mud (SBM). Because of extremely cold sea floor temperatures, the SBM was becoming excessively thick when cooling off in the riser, requiring greater pump pressure to move. This increase in required pressure had previously led to lost circulation risk and very high ECDs. The wide range of temperatures in the circulating system led to uneven and slow circulation. Extra circulation of the system was needed at the surface to return the fluid to a high enough temperature before circulating it back down hole, adding to the drilling time.

HALLIBURTON'S SOLUTION – Previously, in a different field, Baroid brought in N-SOLATE® 275 insulating packer fluid given its track record of reducing heat transfer in the production annulus during production. This particular rig consisted of a high pressure drilling riser or dual wall riser, not usually common in Gulf of Mexico (GOM) drilling. Together with the operator, Baroid examined the entire system and developed the following solution: use N-SOLATE packer fluid in the riser wall annulus, to keep the heat from the synthetic-

based mud (SBM) in the main annulus from being lost to cold sea floor temperatures. This would allow the SBM to keep a more consistent temperature throughout the circulating system, and by keeping the fluid warmer in the riser, excessive viscosity could be avoided which improved circulating time while also reducing risk of lost circulation.

Baroid recommended N-SOLATE 600 packer fluid for this operation due its economical benefit of having the ability to be recovered for reuse. Once the N-SOLATE 600 packer fluid was in place, further lost circulation was not experienced and the equivalent circulating density (ECD) was drastically reduced, allowing for a higher circulation rate and faster drilling. The drilling fluid, which was static across the mudline during trips, returned to surface 20 degrees warmer compared to wells without the insulating effects of the N-SOLATE fluid. More consistent circulation temperatures translated into less stress on the wellbore throughout the operation. Circulation flow rate increased drastically, and extra circulation of the fluid at the surface wasn't needed.

ECONOMIC VALUE CREATED – The greatest economic benefits were found in the reduction in drilling time and reduction of fluid costs from significantly reduced lost circulation. The operator was pleased with the success of N-SOLATE packer fluid and its potential for additional wells to help increase drilling rates. Furthermore, they will look into increasing the use of high pressure drilling risers for this purpose as well.