CASE STUDY

Direct Displacement Using Baroid Casing Cleaner and CFG™ Modeling Saves 10 Hours on Deepwater Operation

OFFSHORE BRAZIL

CHALLENGE

An operator offshore Brazil needed to reduce the time and cost associated with using indirect displacement to replace synthetic-based mud with the selected completion fluid.

SOLUTION

A direct displacement design was implemented, using a Baroid surfactant-based casing cleaner. CFG™ cleanup displacement modeling optimized flow rates and volumes during the displacement.

RESULTS

Baroid's direct displacement design and wellbore cleanout system helped the operator save 10 hours of rig time, valued at USD 150,000.

OVERVIEW

In a deepwater field offshore Brazil, the operator was using the indirect displacement method to replace the synthetic-based mud (SBM) with the selected completion brine. This required using seawater to initially displace the SBM, and then circulating the seawater until it exhibited a turbidity value of less than 30 nephelometric turbidity units (NTU). At that point, the seawater was displaced with a calcium chloride ($CaCl_2$) completion brine.

CHALLENGE

The seawater circulation could take over 12 hours, and the customer needed to reduce the time and cost associated with the displacement operation.

SOLUTION

The Baroid team recommended the direct displacement method as the best way to reduce time and improve efficiency. This approach was implemented successfully on a 5,732-meter (18,806-foot) pre-salt well, resulting in its adoption as a best practice by the operator.

The direct displacement design was based on extensive testing to determine the optimal concentrations of a Baroid surfactant-based casing cleaner and to help ensure compatibility between the SBM, wellbore cleanout spacers, and the final CaC_{l2} brine.

Next, Baroid's Completion Fluids Graphics (CFG™) cleanup displacement modeling software was used to optimize flow rates and volumes during the displacement. The outcomes of the testing and CFG modeling were shared with the customer throughout the process. Additionally, the Baroid completion fluid engineers were very experienced with performing direct displacements in deepwater operations, and they provided close supervision of each step.

RESULTS

The combination of effective cleaning spacers, wellbore cleanout tools, and an optimized direct displacement design resulted in a 10-hour time savings for the operator with an estimated value of USD 150,000.

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