



Baroid Completion Fluids – CFS™ -648 Casing Cleaner

Optimized displacement using CFS™ -648 casing cleaner delivers successful wellbore cleanout with restricted pipe movement

Location: United Kingdom, North Sea

Challenge

During a displacement, pipe movements generally assist the cleanup process. Restrictions in pipe movement can create very challenging conditions. Specific completion requirements of a North Sea well meant that pipe rotation and reciprocation were restricted during the cased-hole displacement. The well was drilled to 8,291 feet with an openhole section of 473 feet and a maximum deviation of 57°. An 11-ppg ENVIROMUL™ oil-based mud (OBM) was to be displaced to 10-ppg sodium chloride brine with < 0.05 percent solids and visibly free from oil.

Solution

While applying the Baroid’s Technical and Black Book design processes, the team identified restriction of pipe movement as a specific challenge. As a result of lab testing, CFS™-648 surfactant-based casing cleaner was selected for the job due to its strong solvent action and high cleaning capacity. CFS-648 cleaner proved to be more powerful than available alternatives and was ideally suited to the technical constraints presented by this application (Fig. 1). It is also a Cefas-approved product, and is on the Offshore Chemical Notification Scheme (OCNS) list without a substitution warning. The displacement design was optimized using modeling and simulation in Baroid’s Completion Fluids Graphics (CFG™) proprietary software package. CFG software can be used to optimize critical parameters such as pump rates, circulating pressures, and annular velocities. A displacement designed to meet the challenges of the application was programmed and presented to the customer. As this was the first completion for the customer in this field, the Critical First Well Execution Process was implemented, ensuring that performance criteria were identified before the operation and measured during the displacement. The challenges presented by the completion and restricted pit space were overcome by careful planning, preparation, and execution of the operation. The wellbore cleanup operation was executed as planned, and the cleanliness standards were achieved after minimum over-displacement and recirculation (Fig. 2). The successful completion and subsequent well testing reinforced the high quality of the whole campaign and the part that CFS-648 cleaner played in the process.

CHALLENGE	SOLUTION	RESULT
Limited pipe reciprocation and rotation during displacement threatened to complicate the wellbore cleanout process	Used optimized design incorporating CFS-648 casing cleaner in order to deliver efficient OBM displacement and to clean brine with minimal interface	Brine consumption was reduced, and rig time and waste disposal were minimized, thus saving the operator approximately US\$9,000

Economic value created

The design and execution of the displacement using CFS-648 cleaner provided a series of benefits for the customer. The efficient displacement created clearly identifiable interfaces that maximized mud recovery and minimized over-displacement. Brine usage was reduced, while rig time and waste disposal were minimized. This equated to an estimated US\$9,000 in savings for the operator.

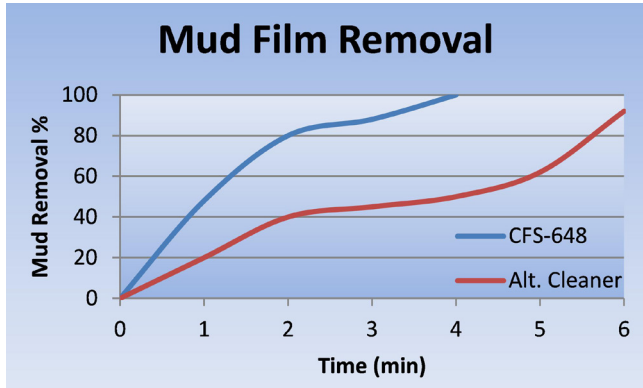


Fig. 1. Mud removal comparison of casing cleaners in selected completion brine.

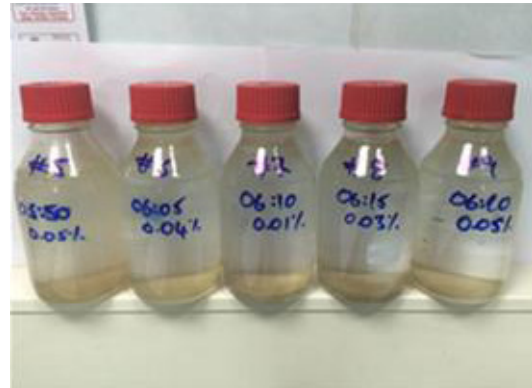


Fig. 2. Closed-loop circulation samples following use of the CFS™-648 casing cleaner pill.