

SAFE-SURF EU Casing Cleaning Agent Reduces Solids in Brine to Less than 0.05%, North Sea

Efficient chemical additive increases displacement efficiency, improves cleanup times, and reduces costs

CHALLENGE

Optimize displacement efficiency on a rig with limited pit space and reduce costs through improved cleanup times.

SOLUTION

Use the SAFE-SURF EU* casing cleaning agent to enhance cleanup performance.

RESULTS

Achieved operator objective of decreasing solid-in-brine level to less than 0.05% and demonstrated water-wet pipe with no residual oil after the pipe string returned to surface.



Optimize displacement efficiency while complying with stringent regulations

An operator was drilling the Cygnus field in the North Sea. Traditionally, complying with North Sea environmental restrictions requires the use of lower-performance chemicals, resulting in increased costs, waste volumes, and rig time for well cleanup. Because pit space was limited on the operator's rig, the operator sought to optimize displacement efficiency by deploying a casing cleanup chemical that would fulfill performance requirements while meeting the strict environmental standards of the region.

Improve well cleanup performance with SAFE-SURF EU agent

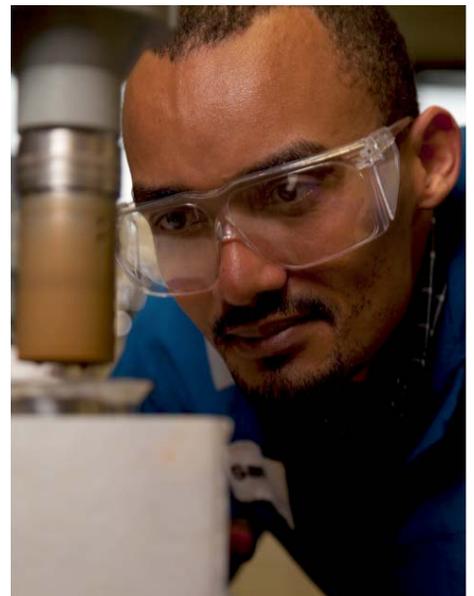
M-I SWACO proposed using the SAFE-SURF EU casing cleaning agent, which features a gold rating in the Centre for Environment, Fisheries, and Aquaculture Science (CEFAS) list of Chemical Hazard and Risk Management (CHARM) chemicals. The agent provides effective cleanup performance for efficient displacement while enabling operators to meet North Sea environmental standards. Designed primarily for downhole cleanup in oil and gas wells, the SAFE-SURF EU agent performs the tasks of thinning, dissolving, and dispersing oil-base mud residues as well as leaving all downhole tubulars and metal surfaces in a water-wet state.

On the basis of previous displacement operations in the Cygnus field, M-I SWACO prepared a detailed pit management program. Spacers were prepared in advance, and the wellbore cleanout string was run in the hole. A concentration of 10.8-lbm/galUS [1,296-kg/m³] VERSAPRO* invert-emulsion reservoir drill-in fluid system was circulated and conditioned.

The pill train consisted of

- 50-bbl [8-m³] base oil followed by a 60-bbl [9.6-m³] high-viscosity push pill containing 5% SAFE-SURF EU agent
- 75-bbl [12-m³] wash pill containing 10% SAFE-SURF EU agent by volume
- 50-bbl [8-m³] high-viscosity catch pill containing 5% SAFE-SURF EU agent by volume ahead of 11-lbm/galUS [1,320-kg/m³] calcium chloride brine.

The chemicals were placed directly in the pits and blended by agitators in the pits. No foaming was observed after adding the chemicals.



After running the SAFE-SURF EU agent, the operator confirmed that the brine contained less than 0.05% solids by volume, achieving its goal. The agent helped optimize the operator's displacement efficiency and saved rig time in the North Sea operation.

The pill train was pumped at 3 bbl/min [0.48 m³/min] down the 5-in drillpipe and 2½-in washpipe to the no-go landing nipple located at 12,374-ft [3,772-m] MD. Once all of the pills were 500-ft [152-m] MD above the MFCT* multifunction circulating tool technology, the tool was opened, and the flow was increased to 14 bbl/min [2.2 m³/min].

Met operator's goals with 0.05% solids

As soon as the returns were pill free, the flow rate was reduced to enable sampling at regular intervals. After an additional 70 bbl [11.2 m³] of brine was pumped—12% above the theoretical well volume—the brine was determined to contain less than 0.05% solids, the target level set by the operator. Furthermore, once the string was removed and returned to surface, pipe inspection indicated that the pipe was water-wet with no indication of residual oil.

Using the SAFE-SURF EU agent helped the operator optimize displacement efficiency and reduce costs through shorter cleanup times while meeting all North Sea environmental regulations.

miswaco.com