



Completion Fluids/Filter Cake Breaker

Delayed-reaction N-FLOW™ 325 breaker system helps increase production from 100 bbl/day to 600 bbl/day, saving US\$500,000 in rig time

Location: Al Khalij Field, Offshore Qatar

Operator's Challenge

A major operator working offshore Qatar plugged perforations in the liner and then drilled a lateral in a carbonate reservoir. The new lateral and the existing perforated interval needed to be stimulated with a filter cake breaker to improve reservoir productivity. The target production rate from this well was 100 bbl/day. The reservoir temperature was 54°C (130°F) and the formation pressure range was 0.58-SG (4.8-ppg) to 0.97-SG (8.1-ppg) equivalent mud weight (EMW).

Halliburton's Solution

The Baroid team recommended, N-FLOW™ 325 delayed-reaction filter cake breaker to stimulate the new lateral in the carbonate reservoir and to also reopen the perforated interval that had been temporarily plugged with acid-soluble lost circulation material (LCM).

The N-FLOW 325 breaker is an acid precursor that converts to formic acid downhole with exposure to time and temperature. Unlike hydrochloric acid (HCl), the N-FLOW 325 acid conversion can be delayed, thereby providing enough time for the system to be placed across both production zones before acid is generated, thus improving overall cleanup.

The N-FLOW 325 breaker was delivered in tote tanks for ease of handling. No special containers, vessels, or pumps were required for the procedure.

HSE Advantage

Because the acid liberation action is slow, the solution contains little or no free acid when placed across the zone to be treated. This results in safer work conditions at the surface, compared to acidizing with HCl.

Economic Value Created

A significant increase in production rate was observed after the N-FLOW 325 system was applied. The expected production rate was 100 bbl/day, and the actual production rate was 600 bbl/day.

An estimated savings in rig time of US\$500,000 was also obtained, based on a comparison with conventional acidizing treatments using HCl.

CHALLENGE	SOLUTION	RESULT
The operator wanted to effectively stimulate a new carbonate reservoir and reopen a plugged perforated interval, using a filter cake breaker.	The delayed-reaction N-FLOW™ 325 breaker system was placed throughout the target zones prior to converting to acid, ensuring a uniform stimulus.	The expected production rate was 100 bbl/day, but, after the N-FLOW 325 treatment, the observed production rate was 600 bbl/day.