



Completion Fluids/Filter Cake Breaker

Delayed-reaction N-FLOW™ 325 breaker system helps increase production from 1,000 bbl/day to 4,000 bbl/day

Location: Al Khalij Field, Offshore Qatar

Operator's Challenge

A major operator in Qatar planned to plug existing perforations in the liner, then drill an open hole in a carbonate formation. The well was to be completed with a slotted liner and stimulated with a filter cake breaker to improve reservoir productivity. The reservoir temperature was 54°C (130°F) with a formation pressure range of 0.58-SG (4.8-ppg) to 0.97-SG (8.1-ppg) equivalent mud weight (EMW).

Halliburton's Solution

The Baroid team recommended stimulating the open hole with the N-FLOW™ 325 breaker system, a delayed-reaction 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 extending time for completion operations. The N-FLOW 325 system can be placed across the entire openhole interval before acid is generated, improving overall cleanup.

A series of laterals were explored, and the final reservoir section was almost 1,000 m long. Following logging operations, the slotted liner was run and set with no issues. The hole was displaced to inhibit sea water and circulated clean. Losses while circulating with sea water were limited to 0.6 m³/hr.

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

In this case, the delay time specified by the operator allowed the breaker to be spotted uniformly throughout the entire perforated liner length. Calcium carbonate and polymers in the filter cake were removed.

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

The expected production rate was 1,000 bbl/day. After completing the N-FLOW 325 treatment, the actual production rate was 4,000 bbl/day.

CHALLENGE	SOLUTION	RESULT
The operator wanted to effectively stimulate a new carbonate reservoir in a mature well.	The N-FLOW™ 325 breaker system was placed throughout the reservoir interval prior to converting to acid, ensuring uniform stimulation.	The expected production rate was 1,000 bbl/day, but, after the N-FLOW 325 treatment, the production rate quadrupled to 4,000 bbl/day.