FAZEPRO System Contributes to Offshore Field’s Highest Injectivity Rate, Lowest Injection Pressure

Invert-emulsion system and FAZE-OUT breaker help increase injection by 30% at 40% less pressure in horizontal injector well, Equatorial Guinea.

CHALLENGE
Deploy a nonaqueous fluid that deposits a filtercake that can be easily cleaned up for a horizontal injector offshore Equatorial Guinea.

SOLUTION
Use nonaqueous FAZEPRO† reversible invert-emulsion reservoir drill-in fluid (RDF) system and FAZE-OUT† reversible-system water-base filtercake breaker to expedite and simplify the openhole completion process.

RESULTS
Streamlined cleanup and increased performance with 30% more seawater injected at 40% less pressure, which is double the amount injected in the previous best offset.

Dissolving filtercake with acid problematic
An operator’s drilling program for injector wells called for an extended horizontal section up to 9,800 ft [2,987 m] along the edge of the formation to ensure reinjection of formation brine into the correct zone. A primary objective was to drill the injectors to maximize injectivity.

Previous injector wells in the field were drilled with a conventional invert-emulsion fluid, which was needed to provide the required inhibition and lubricity. However, in the filtercake cleanup process, after days of circulating, the acid treatment used to dissolve the filtercake was ineffective. Cleaning up and completing these injector wells required more time than drilling. Moreover, injection volumes were inadequate, resulting in high injection pressures at the wellhead.

Selecting an RDF to simplify openhole completion
For its next injector well, the operator chose the FAZEPRO system to deliver the required inhibition and lubricity while expediting and simplifying the completion due to its reversible filtercake. In the completion process, the FAZE-OUT reversible-system water-base filtercake breaker would be spotted along the openhole section to produce a modified pH adjustment that would convert the filtercake from an oil-wet to a water-wet state for easier and quicker removal.

Eliminating costly rig and coiled tubing time and removing acid treatment hazards
The FAZEPRO system helped achieve the highest injectivity rate and lowest injection pressure recorded in the field. The injector realized a 30% increase in seawater injection—more than twice the amount injected in the best offset well—using 40% less pressure.

Using FAZE-OUT breaker eliminated costly rig and coiled tubing time and removed the hazards associated with conventional acid filtercake removal treatments. The procedure also eliminated two preflush steps and replaced the previously used 15% HCl with a delayed acid-precursor breaker. Each of the three steps in the previous routine required 30-minute soaks compared with the FAZE-OUT breaker.

The FAZEPRO system, integrated with the FAZE-OUT breaker, eliminated the need for strong acid treatments to remove filtercake residue that otherwise would be left by a conventional invert-emulsion fluid. The milder treatments not only reduced costs but posed considerably less risk of formation damage while delivering high-quality formation cleanup.