CASE STUDY

HALLIBURTON

Middle East

Operator achieves successful isolation amid challenging conditions

IsoBond™ cement system enables excellent cement bond log results during 4 1/2-in. frac string operation

CHALLENGE

- Place cement for challenging 4 1/2-in. frac string operation
- Achieve proper zonal isolation
- Execute planned fracturing operation

SOLUTION

- Deploy Isobond™ cement system and Tuned® Defense™ cement spacer supplemented with BridgeMaker™ LCM

RESULT

- Recorded excellent CBL
- Standardized IsoBond™ cement system application for all challenging frac string/liner operations

Overview

The increased demand for energy worldwide drives operators to seek innovative methods for hydrocarbon production. Unconventional extraction is a widely used method that involves hydraulic fracturing to unlock the vast potential for unconventional oil resources. When fracturing operations are performed through a cemented string, proper zonal isolation is imperative to achieve optimum fracturing results and maximize oil extraction.

Challenge

An operator in the Middle East, ADNOC, faced several issues in the past attributed to poor zonal isolation for the frac strings cemented in an unconventional field. This led to zonal communication while fracturing, changes to the fracturing programs, and overall loss of production, which increased costs. The systems used to cement these frac strings were limited to mechanically enhanced systems with post-expansion properties, which did not achieve satisfying cement bond log (CBL) results.

Solution

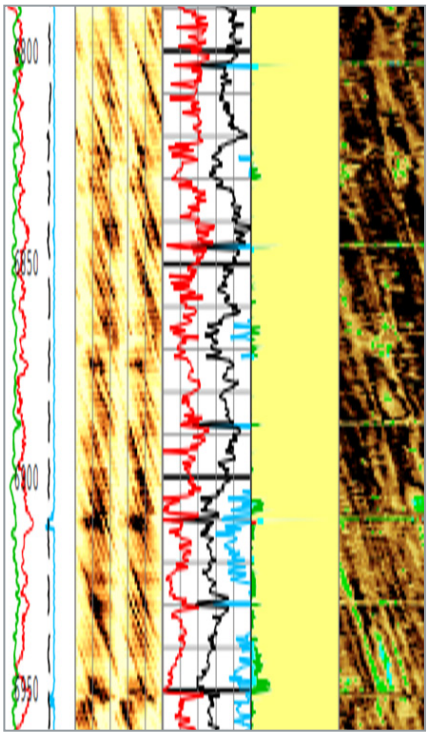
Halliburton supported the operator to identify the cause of repetitive poor CBLs. As a result, Halliburton proposed the IsoBond™ cement system to minimize fluid loss to the formation. IsoBond cement system provides tight fluid-loss control to help ensure successful cement slurry placement across challenging formations.

The system builds rapid gel strength, and this short transition time reduces the risk of gas or fluid flow through the cement slurry. The increased anchoring capability of the system supports zonal isolation and prevents debonding that can create a flow path for fluid or gas migration up the annulus. To further ensure proper bonding around the pipe, the system was designed with a preset expansion material to overcome cement shrinkage during the cement setting stage.

Halliburton supplemented Tuned® Defense™ cement spacer with BridgeMaker™ II lost-circulation material (LCM) and pumped it downhole ahead of the IsoBond cement system. Tuned Defense cement spacer is designed to optimize fluid rheology, mitigate losses, improve mud displacement, and prepare the wellbore for cement. BridgeMaker II LCM enhanced the cement spacer to help prevent losses and achieve the desired top of cement (TOC).

Result

This operation resulted in the flawless execution of the first IsoBond cement system application in the Middle East region by ADNOC for a challenging 4 1/2-in. frac string placed in an 8 1/2-in. openhole with more than 3,000 ft of lateral section. All operational objectives were met with no losses during cement placement. Excellent CBL results were achieved with good cement bonding across the zones to be fractured. After successful execution and evaluation of the first IsoBond™ cement system by ADNOC, the operator decided to standardize IsoBond cement system applications across all challenging frac string/liner operations.



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