Case Study
i-Frac™ CEM

North Sea Operator Sets Record with 80 i-Frac CEM Sleeves in Extended Reach, Matrix Acidizing Completion

NOV Completion & Production Solutions

i-Frac™ CEM

Background

A North Sea operator was conducting a re-drilling campaign to add incremental production to a mature asset. To maximize production in the high porosity, low permeability chalk, the operator designed the new producer wells with extended reach horizontal sections and matrix acidizing to increase reservoir permeability. A completion solution that maximized the efficiency of acidizing operations in long horizontal wells was required to meet time and budgetary targets. Due to the proximity of the re-drilled wells to existing water injectors, zonal isolation and the ability to shut-off future water break-through was a critical requirement of the completion solution

Solution

NOV Completion Tools proposed using the i-Frac CEM™ system together with the i-Seat to maximize the efficiency of the matrix acidizing job over the long reservoir section. The i-Frac CEM™ system allows for up to 20 ball drop activated sleeves to be run in a single zone and activated with a single ball, while the i-Seat provides a robust landing point for the ball and isolation of the lower zone. The i-Frac CEM™ system has a proprietary cement protection system, isolating critical shifting components from debris during cementing operations. The i-Frac CEM™ system is also compatible with the i-Shift shifting tool, to enable closing of sleeves with coil tubing, wireline or a tractor system in case of water breakthrough later in the life of the well.

Result

A four-zone completion with a total of 76 i-Frac CEM™ sleeves and 4 i-Seats was successfully run to 21,078 ft measured depth (MD) / 10,590 ft true vertical depth (TVD) and cemented in place with a foam cement system. After the liner hanger was set, a clean-out run was performed and the lower completion was pressure tested successfully. The upper completion was run as per program.

All four zones were successfully opened and stimulated at up to 60 barrels per minute with 28% HCl acid.

The completion and stimulation operations were completed within the time and budgetary forecasts, and the well is producing at target initial production (IP) rates.

Case Study Snapshot

Project Area: **North Sea (Norway)**

Date: **2016**

Challenges:

- Running completion successfully in deep, horizontal wells
- Matrix acidizing efficiency over long horizontal sections
- Potential future water breakthrough

Solution:

- i-Frac CEM system and i-Seat to allow for most efficient matrix acidizing method over long reservoir sections
- i-Frac CEM system with cement protection system to ensure successful shifting operations in the future

Results:

- A total of 76 i-Frac CEM sleeves and 4 i-Seats were successfully run to planned depth at 21,078 ft
- All 4 zones were opened and stimulated successfully
- All completion and stimulation operations were completed within time and budgetary limitations
- Production targets have been met

All four zones were successfully opened and stimulated at up to 60 barrels per minute with 28% HCl acid.

Stimulation Engineer with Operating Company