Hybrid Cemented Frac Sleeve Solution Saved USD 120,000, Reduced Required Hydraulic Horsepower by 60%
Location: Anadarko Basin, Texas Panhandle

An operator near Canadian, Texas in the Anadarko Basin needed to effectively fracture a well with a 7,000-ft (2130-m) cemented lateral. The operator initially wanted to stimulate the entire lateral using CT-activated Baker Hughes OptiPort™ frac sleeves—a technology that enables rapid fracs using the sleeves as a single entry point—but the length and geometry of the 5.5-in cased lateral meant that the coiled tubing (CT) string might experience lock-up before reaching the target depth. The last 1,500 ft (460 m) of the lateral would potentially go untreated as a result.

Baker Hughes worked with the operator to customize a hybrid cemented frac sleeve completion system consisting of three sleeve technologies: pressure-actuated Alpha™ sleeves, FracPoint™ ball-activated frac sleeves, and CT-activated OptiPort frac sleeves. The combined technologies provided a frac sleeve solution for extended-reach laterals requiring cement isolation.

The frac sleeves were run as part of the casing string, and the Baker Hughes Alpha sleeve and six cemented FracPoint sleeves were positioned across the deepest stages of the lateral. The Alpha sleeve was used to provide initial reservoir access, and the ball-activated FracPoint sleeves were used to complete treatment of the lower stages, where the wellbore exceeded the reach of CT. The OptiPort CT-activated frac sleeves were used to complete the uppermost 37 stages in the lateral, which were within the safe operating limits of CT.

The use of single-entry frac sleeves provided an estimated 60% reduction in required hydraulic horsepower compared to plug-and-

Results
- Improved efficiency and reduced environmental impact by lowering hydraulic horsepower required during treatment by an estimated 60%
- Enabled interventionless fracturing of deepest stages and required no post-frac intervention
- Saved 3 days and an estimated USD 120,000 by using a hybrid cemented frac sleeve completion system built on proven technologies

Challenges
- 7,000-ft cemented lateral with the toe of the well extending beyond the reach of CT
- Customer wanted to use single-entry fracturing across entire lateral for improved fracturing effectiveness to increase production

Baker Hughes solution
- Provided interventionless reservoir access at the toe of the well using a pressure-actuated Alpha sleeve
- Installed FracPoint cemented frac sleeves to deliver interventionless fracturing operations at depths beyond the reach of CT
- Used OptiPort sleeves to efficiently treat remaining 37 stages
perf completions used in offset wells. The single-entry frac sleeves require no post-frac milling or intervention before putting the well on production, saving at least 2 days of mill-out time on this well. The Alpha sleeve saved another day that would have been required for a tubing-conveyed-perforating run to the toe of the well.

Combining the proven multistage fracturing capabilities of the Baker Hughes frac sleeves allowed the operator to successfully treat a 7,000-ft lateral in only 4 days. Compared to a standard plug-and-perf operation using composite plugs, it is estimated the operator saved a total of USD 120,000 while dramatically reducing the hydraulic horsepower required.

Ball-activated FracPoint sleeves offered interventionless single-entry fracturing beyond the reach of CT.

The CT-activated OptiPort multistage fracturing system reduced required hydraulic horsepower and environmental impact, and provided better control of the fracture with a single entry point.