Case Study

DC FracPORT sleeve allows for isolation of a lost-circulation zone

United States, James Lime
StackFRAC HD System

Background

Packers Plus is known for providing innovative, technology-based solutions for oil and gas producers' well completion needs. One such need is the capability for future operations post-stimulation. This can include water or gas shutoff, isolation of a lost-circulation zone, or refracturing. To fulfill these requirements, Packers Plus designed the Drillable Closeable FracPORT™ (DCFP) sleeve for the field-proven StackFRAC® multi-stage fracturing system.

Challenge

The James Lime formation in Texas and Louisiana was discovered in 1960. It is a highly heterogeneous Lower Cretaceous carbonate with both oil and gas reserves. An operator working in the James Lime gas trend in east Texas had been running the DCFP in its James Lime horizontal wells, recognizing their utility due to the potential for water production in this area.

During the drilling of a horizontal in Shelby County, the operator encountered a lost-circulation zone. Knowing that this would present difficulties for the completion, the operator chose to run a StackFRAC system with DCFPs so they would be able to close off any problem zones after stimulation.

Solution

An 8-stage StackFRAC liner was run to a total depth of 9,575 ft. Stages one through five were effectively stimulated, but during treatment of stage six and seven, the well went on vacuum due to the lost-circulation zone spanning zones six to eight. Having previous experience successfully closing a DCFP on a James Lime well for water shutoff, the operator knew the technology was robust. The operator decided to mill out the ball seats on stages six to eight and then close off the DCFPs to isolate the lost-circulation zone.

Results

The DCFPs were successfully closed using a flow-activated shifting tool. Various indicators at surface showed that the DCFPs had closed properly, including latching in at expected collar

locator depths and a gain and subsequent release of overpull weight. To further confirm that the DCFP was closed, the shifting tool was run back through the port, and no overpull weight was observed. Because the well was on vacuum before closing of the DCFP, a major indicator that it had successfully closed was the fact that well pressure returned and it was flowing.

Stage eight was known to be a good production interval in other wells, so the operator decided to re-open it to assess its viability. This was also executed using a flow-activated shifting tool. Again, all indicators at surface showed that the DCFP opened properly. Unfortunately, opening of this zone caused the well to go on vacuum again. Therefore, the operator chose to re-close it and continue with production from stages one through five.

Overall, three DCFPs were closed, with one being re-opened and re-closed again. During stimulation, the DCFP is opened via ball-actuated hydraulic pressure. Post-stimulation, the DCFP design allows it to be opened and closed using a variety of shifting profiles with or without the ball seat in place.