Case study: Uintah Basin, Utah

ControlSET FLEX-LOCK liner hanger system reached bottom after 6 days of aggressive washing and reaming

A customer in the Uintah Basin was having difficulty with getting liners to total depth (TD). The long laterals required constant liner manipulation to reach bottom. On one trip, the customer ran a liner into the wellbore but the LT assembly ran into the wellbore after only 24 hours. To make progress, over the course of the next 6 days, the system had to be rotated at torque values ranging from 7200 to 10,000 ft-lb. While washing down, pressures reached 1,800 psi (12.4 MPa). Finally, after days of struggling to run the liner from 13,000 to 20,902 ft (3962 to 6371 m), progress stalled out. The customer was compelled to set the liner top at 9,834 ft (2997 m), resulting in a liner shoe depth of 20,902 ft (6371 m), approximately 570 ft (174 m) off bottom. When a competitor tried and failed to close the gap, the customer contacted Baker Hughes.

As a solution, Baker Hughes suggested the **ControlSET™ FLEX-LOCK™ V liner hanger system** because of its robust torque and combined loading capabilities. The ControlSET hanger incorporates a pressure-balanced system to prevent the hanger from premature setting while circulating with high pressures during the mud/air swap process associated with floating liners. In addition to unlimited circulation pressures, the ControlSET system provides a higher torque rating of 13,700 ft-lb (577 N m).

Also recommended was the **ZXHD™ liner top packer** that combines the proven V0-rated sealing capabilities of the **ZXP™ liner top packer** with a streamlined design that secures the packer to the casing and holds the liner firmly in place. The **HRD-E™ hydraulic released running tool** was included to provide the torque transition from the drill string to the liner.

A bottomhole assembly ran the 5 x 7-in. ZXHD liner top packer and the ControlSET FLEX-LOCK V liner hanger system into the wellbore. In a total of 147 hours, the Baker Hughes tools washed and reamed the customer's liner to bottom. The operation resulted in the successful actuation of the hydraulic set hanger, release of the HRD-E running tool, a successful cement job with a confirmed plug bump, and a positive set and test of the ZXHD liner top packer.

Baker Hughes delivered an additional 400 ft (122 m) of lateral length over the previous operator, a difference of 4%. With the liner top having the capability to be set and tested, the customer also saved the time and expense of not having to perform any remediation work, or to have to pull the liner for a re-run due to the liner top not functioning or not reaching optimal depth in the well.

Pleased by the results on the first installation and the 4% increase in lateral completion length as compared to the competitor's system, the customer awarded Baker Hughes 100% liner work for both drilling rigs.

Challenges

- Increase operating parameters (torque, circulation pressure, and slackoff weight) to complete greatest lateral completion length
- Prevent a misrun from occurring
- Deliver a liner hanger that would not pre-set, or prematurely release in the event aggressive rotation and circulation were required to reach target depth

Results

- Enabled a successful liner installation after having to aggressively wash and ream to bottom.
- Increased lateral length by 4% increase as compared to a competitor's system
- Eliminated remediation work had the liner pre-set or released early
- Experienced no health, safety and environmental (HSE) issues or nonproductive time (NPT)
- Reduced methanol usage and handling