Weatherford Premium Hydraulic Rotating Liner Hanger System and Diamondback™ Reamer Shoe

Reach TD to Achieve Zonal Isolation

Objectives

- Ream with liner to mitigate challenging hole conditions
- Reach target depth and achieve zonal isolation despite hole instability and weak formations

Our Approach

- Based on experience from nearby offsets, a Caspian Sea operator planned to ream with liner to isolate a problem formation in the 8 1/2-in. section of an upcoming well. The operator had previously been disappointed by competitor liner systems that prematurely released and failed to reach total depth (TD) or achieve zonal isolation. They called on Weatherford to provide a liner solution that could withstand reaming through tight spots and high circulation rates. It would also have to provide clear indications of shear and setting pressures to determine accurate pumping and cementing rates to avoid harming weak formations.
- Weatherford liner systems experts proposed a hydraulic-rotating liner-hanger system, with an R-type running tool, and a reamer shoe. A bearing in the Weatherford premium hydraulic rotating liner hanger (WPHR) enables reciprocation and vigorous rotation of the liner while running in the hole, so it can be set in high-angle and extremely deep wells. It was run in conjunction with a rotating running tool. The liner-top packer, which connects the liner to the running tool, is lock-wired to the polished-bore receptacle to prevent backing off during aggressive rotation to bottom. The reamer shoe is reinforced with carbide cutting structures to increase durability.
- A Weatherford crew deployed to the rig with the liner installation equipment. They successfully ran the liner to TD despite several hours of reaming and circulating to work through tight spots. While cementing, they rotated the liner hanger to enhance coverage around the liner. Next, they set the liner top packer and tested it to verify successful annular isolation.

Value to Customer

- The Weatherford 7-in. WPHR liner hanger , reamer shoe, and running tool enabled the operator to reach TD and achieve isolation of the target zone with no losses or damage to the formation.
- The job was completed with clear indications of shear and setting pressures.
- The capability to rotate the liner while cementing significantly improved the quality of the cement bond.

From left to right, R-type running tool, WTSP5R3 high-pressure liner-top packer, WPHR premium hydraulic-rotating liner-hanger and the Diamondback™ reamer shoe help operators reach and isolate challenging formations.

LOCATION
Turkmenistan Offshore, Caspian Sea

WELL TYPE
Exploration

HOLE SIZE AND ANGLE
8-1/2 in., 29° deviation

LINER SIZE AND TYPE
7-in., 32-lb/ft JFEBEAR™

LINER TOP
11,211 ft (3,417 m)

LINER SHOE
13,853 ft (4,223 m)

BOTTOMHOLE TEMPERATURE
190°F (88°C)

BOTTOMHOLE PRESSURE
12,123 psi

TOTAL DEPTH
13,862 ft (4,225 m)

PRODUCTS/SERVICES
- 7-in. WPHR premium hydraulic-rotating liner-hanger system
- WTSP5R3 high-pressure liner-top packer
- WPBR polished-bore receptacle
- Jointed SWP single-wiper plug system
- Diamondback™ reamer shoe
- R-type running tool

* JFEBear is a trademark of JFE Steel Corporation