Schlumberger

PowerDrive X6 RSS and SonicScope Service Used for First Time in Openhole Kickoff in Labaganskoye Field

Rotary steerable system and multipole sonic-while-drilling service drills through challenging fractures, onshore

CHALLENGE

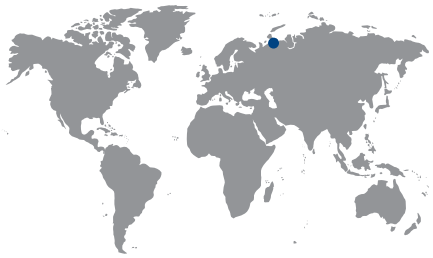
- Drill four multilateral wells with five horizontals each.
- Maintain the planned trajectory through fractured formations.
- Perform four openhole sidetracks.

SOLUTION

Use the PowerDrive X6* rotary steerable system in the 675 and 475 tool sizes in combination with the SonicScope* multipole sonic-while-drilling service to effectively map formation fractures and maintain the planned trajectory.

RESULTS

- Reduced the kickoff time from 32 to 22 hours
- Drilled shoe to shoe in a single run
- Drilled four openhole sidetracks and five laterals without changing the BHA
- Drilled the longest lateral (1,525-m) section in a single run profile in well history



Drill four wells with five horizontals each through fractured formation layers

To increase production while optimizing cost, LLC RN-Severnaya Neft wanted to drill four multilateral wells with five horizontals each in Labaganskoye Field. Because of Schlumberger's achievements in Western Siberia, Severnaya Neft contacted Schlumberger about advanced logging-while-drilling (LWD) services to evaluate fractures in productive formation layers and increase oil recovery.

The technology would have to drill horizontally through faults and perform an openhole kickoff in a carbonate formation with an RSS. Because neither Schlumberger nor the operator had experience with drilling multilateral wells through this formation in the region, they performed extensive planning and modeling to reduce the risk of sticking and mud losses. A motor BHA would be ineffective in sliding mode because of the risk of buckling in the horizontal section, so they decided to use a BHA that included a passive cutting structure to avoid nonintentional walk or build.

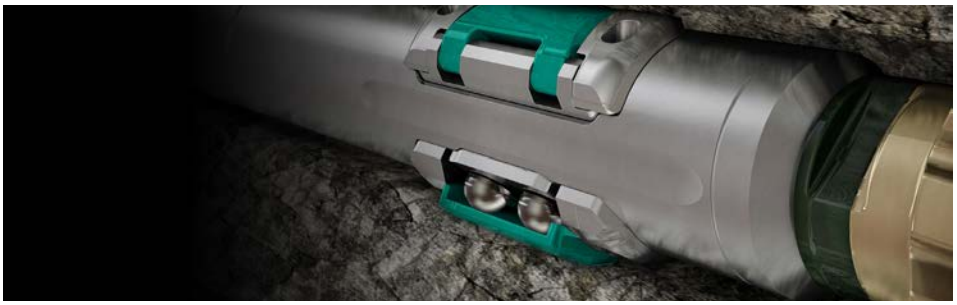
Use a PowerDrive RSS and the SonicScope service to enable drilling to plan

Based on the offset data from other locations, DLS requirements, and openhole sidetracking experience, Severnaya Neft decided that a BHA with an RSS would be best in this application.

After agreeing to modify the bit to avoid bit balling in the 219.1-mm section, Severnaya Neft decided to use the SonicScope multipole sonic-while-drilling service to evaluate formation properties and the PowerDrive X6 RSS to drill in rotary mode, minimizing drilling risks such as drillstring buckling and sticking. This information, along with data from the ImPulse* integrated MWD platform and VISION* azimuthal density neutron service, was used to identify formation porosity and permeability with the ELANPlus* advanced multimineral log analysis. The SonicScope service enables full formation evaluation without a separate wireline logging run after drilling.

Drilled shoe to shoe in a single run and saved 10 h of kickoff time

The high-quality data gained from the SonicScope service enabled full formation evaluation while drilling to ensure positioning the well inside productive layers. The PowerDrive X6 RSS enabled drilling shoe to shoe in a single run—four runs less than planned for this section. The longest horizontal section was drilled in a single run at 1,525-m MD. Four openhole sidetracks and five laterals were drilled without changing the BHA, with only 285.5 circulation hours and 354.3 operating hours. This was the first time that four kickoffs were completed using the same BHA with an RSS in a single run. The process resulted in a kickoff time reduction from 32 h to 22 h. Since this initial deployment, Severnaya Neft has been successfully using these technologies and process for more than a year on this project.



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