

LLC RN-Severnaya Neft Saves 3 Days in Well Construction Time Using Directional Casing-While-Drilling Service

Allegro CD service optimizes bit design to increase ROP 135%, Timano-Pechora Basin

Using the Allegro CD* directional casing-while-drilling service, LLC RN-Severnaya Neft (RN-Severnaya Neft) optimized directional drilling into a formation consisting of clay, claystone, and sandstone, reducing well construction time.

Well construction challenges

In conventional drilling operations, wellbore instability due to the long exposure time of the formation can cause well construction challenges such as stuck pipe, which could lead to the loss of the BHA, multiple trips to reach TD, and high NPT.

Although wells in the Labaganskoe Field of the Timano-Pechora Basin experienced high ROP during conventional drilling operations, wellbore conditions caused stuck pipe, and casing was unable to reach TD. In addition, NPT from designated wiper and reaming trips often exceeded drilling time.

What Schlumberger recommended

The Allegro CD service leverages a suite of software, including the IDEAS* integrated dynamic design and analysis platform, to provide a comprehensive risk analysis of drilling conditions and customize a PDC bit for specific applications. Once the bit is incorporated onto the BHA and run downhole with casing, the assembly enables more effective borehole cleaning and promotes a plastering effect: Rotating casing smears cuttings into the borehole wall and seals pores in the formation, producing a stronger borehole.

What RN-Severnaya Neft achieved

Using the Allegro CD service, Schlumberger tested 9⁵/₁₆-in casing and a six-blade, 8¹¹/₁₆-in MDi613 PDC bit using 13-mm cutters and 6³/₄-in positive displacement motor (PDM) in a pilot well. In concert with the PowerDrive X6* rotary steerable system and high-ratio Rhino* integrated borehole enlargement system, the Allegro CD service drilled and cased the first well to 1,056-m TD in one run—with no deviation in the planned trajectory.

For further customization in the next two wells, the Allegro CD service was used to design an 8¹¹/₁₆-in X516 PDC bit with 16-mm Axe* ridged diamond elements and 7¹¹/₁₆-in PDM. The design improved fluid flow for better hole cleaning, generated higher torque by reducing the rpm, and created a more aggressive cutting structure for improved ROP. As compared with the first pilot well, ROP increased 110% in the second well and 135% in the third well, and both wells reached TD in a single run.

For all three wells, casing strings were set at TD without stuck pipe issues, and NPT was reduced by eliminating wiper and reaming trips, saving 3 days in well construction time.

More technical details

See SPE-196784

