Precise Whipstock Setting Enables Drilling of 1,992-m Sidetrack with Zero NPT in ERD Sakhalin Well

TrackMaster CH whipstock mills window and exits casing in less than 4 hours in single trip for RN-Sakhalinmorneftegaz

**CHALLENGE**
Optimize whipstock setting depth and mill a window out of 9\(\frac{5}{8}\)-in casing for geosteering through pay zones in extended-reach drilling (ERD) project.

**SOLUTION**
Use WhipSim® whipstock simulation software to design the whipstock operation with trajectory and bending stress in consideration, which selected the TrackMaster CH* cased hole whipstock system to exit the window. The sonicVISION® sonic-while-drilling service was included to locate casing collars and evaluate cement quality for best whipstock placement.

**RESULT**
- Successfully set whipstock and milled window in a single trip, taking less than 4 hours.
- Performed 1,992-m sidetrack in ERD project, achieving all directional objectives with PowerDrive X6* rotary steerable system (RSS) and directional PDC bit.
- Executed project with zero NPT.

**Plan sidetrack for ERD project on Sakhalin Island**
RN-Sakhalinmorneftegaz LLC, a subsidiary of Rosneft and one of Russia’s oldest hydrocarbon producers, is developing more than 30 ERD wells on Sakhalin Island of far-east Russia. The operator drilled a cased hole well in this region and decided to drill a sidetrack through the 9\(\frac{5}{8}\)-in casing for an extended-reach well through the reservoir. Thorough prejob planning was necessary to design and select the technologies fit for the project.

**Use integration software for optimal whipstock placement and drilling performance**
Schlumberger used integration technologies such as IDEAS® integrated drillbit design platform for the PDC bit and its cutting structure and WhipSim whipstock simulation software to model the whipstock setting and casing exit window. Services for the plan included sonicVISION sonic-while-drilling service to locate casing collars and evaluate cement quality behind the casing, TrackMaster CH whipstock system to create the exit window, and the durable PowerDrive X6 RSS coupled with an 8\(\frac{1}{2}\)-in directional MDi616 drill bit with ONYX® PDC cutters from Smith Bits, a Schlumberger company.

The TrackMaster CH whipstock system needed to be set in the optimal location to reduce the risk of tracking along the exterior of the original casing. To model whipstock placement, WhipSim software was run to estimate the effective dogleg for trajectory planning and determine the bending stresses across the whipstock and through the exit window for BHA and subsequent completion string planning.
CASE STUDY: TrackMaster CH whipstock mills window and exits casing in less than 4 hours in single trip

The IDEAS platform specially designed the directional PDC drill bit for superior directional control while reducing shock and vibration, and ONYX cutters were incorporated in the design to retain sharpness at high ROP to TD.

The team also placed a Hydra-Jar AP* double-acting hydraulic drilling jar to mitigate the risk of getting stuck on the challenging 3D extended-reach well. Jar-Pact* impact tool BHA placement software was run to evaluate BHA configuration for maximum impact in case of stuck pipe.

Milled window in less than 4 hours, geosteered sidetrack to TD with zero NPT

With sonicVISION service identifying and evaluating surroundings downhole, the TrackMaster CH whipstock system was set between casing joints with good cement behind the casing. The window and rathole were milled out in less than 4 hours and the sidetrack was successfully kicked off according to plan. This precise placement of the whipstock enabled the PowerDrive X6 BHA to drill 1,992 m to TD, using real-time azimuth and inclination to geosteer through the pay zones. The sidetrack achieved 2.8°/30-m dogleg severity. When the BHA was tripped up after TD, the ONYX cutters were graded 1-1 for minimal wear.

The integration technologies used for design and selection of application-optimized services enabled RN-Sakhalinmorneftegaz to drill the extended-reach well with zero NPT.

Contact your local Schlumberger representative to learn more.