

High Build Rate RSS Delivers Dogleg Assurance in Challenging Formations

PowerDrive Archer RSS saves 4 days and USD 4.5 million offshore Asia

CHALLENGE

Deliver precise well placement in horizontal multilateral project where extremely unconsolidated formations cause difficulty in maintaining directional control.

SOLUTION

Design a BHA using PowerDrive Archer* high build rate RSS to maintain control of well trajectory in extreme drop zones, PeriScope* bed boundary mapper, TeleScope* high-speed telemetry-while-drilling, and adnVISION* azimuthal density neutron services with a Smith Bits SHARC* high-abrasion-resistance PDC drill bit designed using the IDEAS* integrated drillbit design platform.

RESULTS

Successfully drilled and completed a total of six lateral wells without sidetracks, saving an estimated 4 days of drilling and USD 4.5 million. Reduced attic oil, which has potentially delivered several million USD in production enhancement.



High-quality wellbores for multilateral wells in unconsolidated formations

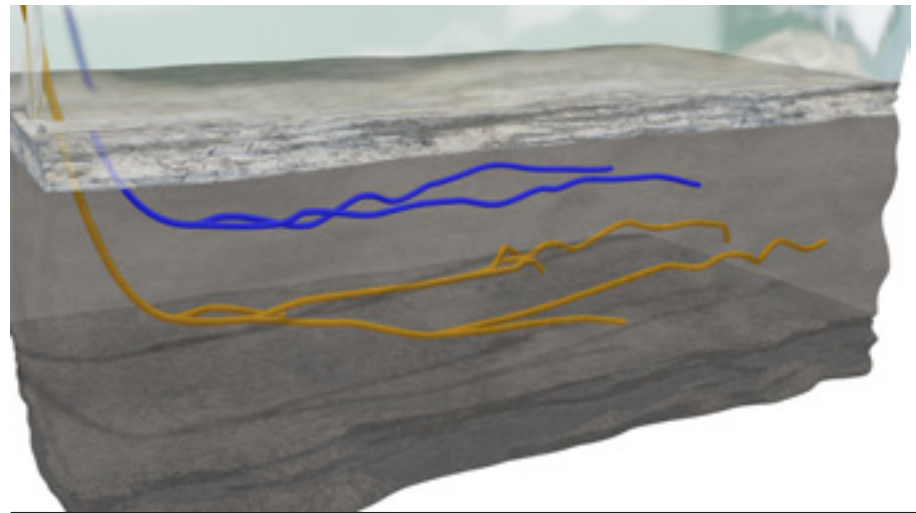
An operator drilling in an offshore oil field in Asia in water depths ranging from 350 to 420 m [1,148 to 1,378 ft] was facing a number of drilling and completion challenges. The wells were designed with an extended-reach drilling (ERD) ratio of up to 1:3. Early in the planning process, many wells were identified that could only be drilled with RSS technology to save time and drill low-tortuosity wellbores. Mud motor drilling would make the drilling process time-consuming and result in a more tortuous wellbore, reducing maximum possible step-out and horizontal section during both the drilling and completion phases.

However, drop zones associated with geological flooding surfaces diminished the performance of other rotary steerable systems because the BHA was not able to hold the desired angle. These drop zones required the use of directional sidetracks or motor BHA drilling to successfully drill the wells to TD.

Fit-for-purpose BHA using high build rate RSS

The operator requested that Schlumberger design a BHA that could drill the next phase of the project with optimal trajectory control. The primary objectives were to steer through drop zones, precisely steer within 1 to 2 m of the reservoir boundary, and minimize time in hole by avoiding sidetracks.

The PowerDrive Archer RSS was identified as the best rotary steerable solution because its 17°/100-ft capability would enable it to cross drop zones and steer in areas where other assemblies could not. Schlumberger worked with the operator to design specific bits and BHAs to deliver top drilling performance and the directional control required in these challenging formations.



PowerDrive Archer wells (in blue) were successfully geosteered through the reservoir without losing directional control as in previous projects with conventional technologies (in yellow).

CASE STUDY: PowerDrive Archer RSS saves 4 days and USD 4.5 million offshore Asia

An assembly incorporating PowerDrive Archer, PeriScope, and TeleScope services and adnVISION tools was designed along with a bespoke Smith Bits 8½-in, 7-bladed, 16-mm SHARC MSi716LKUBPXX cutter bit. The bit was designed specifically for this application using the IDEAS drillbit design platform, and the BHA configuration was modeled at a Schlumberger Product Center.

Improved reservoir exposure, less drilling time, more confidence

The PowerDrive Archer service successfully drilled the six laterals, totaling more than 11,000 m (36,089 ft). Schlumberger well placement engineers used the PeriScope bed boundary mapper to precisely geosteer the laterals with superior directional control and response delivered by PowerDrive Archer RSS.

The unique hybrid steering action of PowerDrive Archer service was used to perform seven efficient openhole sidetracks purely for geological reasons to reduce attic oil. For the first time in the multiwell project, the operator was confident in taking this action.

All the wells were drilled without a single PowerDrive Archer RSS failure, saving the operator an estimated 4 days of drilling time valued at USD 4.5 million.

Contact your local Schlumberger representative to learn more.

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