CHALLENGE
- Drill an S-shaped, extended-reach well shoe to shoe with a drop from 86° to 55° inclination with a planned 2°/30 m dogleg.

SOLUTION
- Deploy the PowerDrive Xcel* rotary steerable system (RSS) to maintain trajectory while drilling an extended-reach well through hard stringers.
- Use near-at-bit gamma ray capability to maintain geosteering within the section.

RESULTS
- Drilled a 2,000-m section in one run.
- Collected accurate formation evaluation data while drilling.
- Successfully completed the planned drop from 86° to land the well at the intended 55° inclination, and set 9½-in liner above the reservoir.
- Minimized hole tortuosity through hard drilling intervals to TD, ensuring smooth postdrilling operations.

Drill challenging S-shaped well trajectory
An operator in Russia planned to drill a challenging S-shaped, extended-reach well with a drop from 86° to 55° inclination. To achieve this, the operator had to minimize tortuosity and maintain trajectory while drilling through hard stringers at a drop rate of 2°/30 m.

In addition, while drilling the operator needed to capture in-depth formation data, including density and caliper measurements for the geomechanics mud-weight window, pinpoint the correct liner setting depth, and calculate equivalent circulating density (ECD). Accuracy was critical because of the risks of losses and to guide completion design. Setting the liner at the right depth would maximize the success of future fluid production.

Use PowerDrive Xcel RSS to optimize steering
Schlumberger recommended drilling with the recently introduced PowerDrive Xcel RSS with real-time gamma ray because the point-the-bit technology performs reliably in high-profile directional drilling operations. It also senses magnetic and inertial stick/slip as well as shock and vibration on three axes.

Given anticipated hard stringers and the S-shaped extended reach drilling, the PowerDrive Xcel RSS will provide the operator with crucial monitoring for optimal placement of the 9½-in liner, while the advanced directional control will enable confident drilling of the complex section without compromising LWD data acquisition.

Drilled and logged section in one run
The PowerDrive Xcel RSS drilled the 2,000-m interval from shoe to shoe in just one run with little or no shock and vibration. The high-quality, real-time data captured by the BHA enabled the drilling team to land the well at the planned 55° inclination and determine the liner setting depth without any additional logging runs. The azimuthal hold feature of the PowerDrive Xcel RSS minimized tortuosity and enabled the operator to float the liner to total depth.

Despite S-shaped well and the varying rock hardness, the PowerDrive Xcel RSS drilled the interval in a single run.