High Build Rate RSS Drills Curve and Lateral of Marcellus Shale Well in One Run and 100% in Zone

PowerDrive Archer RSS run with electromagnetic telemetry system achieves 128 ft/h only 1 ft to the right and above plan.

CHALLENGE
Reduce costs and improve drilling efficiency in horizontal wells in the Marcellus Shale.

SOLUTION
Drill the curve and lateral section in one run with the PowerDrive Archer* high build rate rotary steerable system (RSS).

RESULTS
- Drilled the curve and lateral to TD at 11,210 ft in one run—100% in the zone and only 1 ft to the right and 1 ft above the plan.
- Achieved an average ROP of 128 ft/h.

Reduce drilling time and trips down the hole in long horizontal well
An operator in the Marcellus Shale wanted to improve ROP and decrease the number of trips in horizontal wells. The operator wanted to complete the curve and lateral in just one run, which was not previously possible with traditional motor BHAs due to the length of the laterals. In addition, there was a need to trip after the curve for the dedicated RSS run.

Use highly durable RSS to drill curve and lateral in one run
Schlumberger proposed using PowerDrive Archer high build rate RSS with an electromagnetic (EM) telemetry system to drill the curve and lateral in just one run—the first deployment of this technology pairing. The PowerDrive Archer RSS builds high angles from any deviation to land at the lateral section sooner for increased hydrocarbon production potential. It provides accurate and precise control to land the well trajectory in zone and drills high-quality wellbores with low friction and tortuosity for increased ROP. Adding EM telemetry to the BHA enabled connectivity independent of circulation and the transmission of real-time surveys at up to 4 bps. Real-time gamma ray (GR) measurements were used to guide geosteering throughout the lateral.

The curve was landed 1 ft to the right and 1 ft above plan, and the lateral was placed 100% in zone.
CASE STUDY: PowerDrive Archer RSS run with EM telemetry system achieves 128 ft/h while drilling 100% in zone

The BHA included a Spear* SDi513 shale-optimized steel-body PDC drill bit from Smith Bits, a Schlumberger company. The Spear bit is specifically designed to efficiently drill the curve and lateral in one hole section.

**Reached TD in one run for one of the fastest ROP wells in area**

The PowerDrive Archer RSS drilled the curve and lateral with an average ROP of 128 ft/h. The curve was landed in just one run approximately 1 ft to the right and 1 ft above the plan. The lateral was placed 100% in zone with the use of real-time GR measurements. The well exceeded the operator’s expectations, with no deviation from the plan. The operator now plans to use the PowerDrive Archer RSS and EM telemetry for other wells in the Marcellus Shale.

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The Schlumberger directional drilling team landed the curve and lateral sections with no deviation from the plan, taking full advantage of the lease.

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