

Operator saves 61 hours and USD \$500,000 with Geo-Pilot® XL RSS Combined with Underreamer

ENGINEERED SOLUTION FOR DRILLING AND TRIPPING IN HETEROGENEOUS FORMATIONS REDUCES WELL TIME

OFFSHORE INDONESIA

CHALLENGE

- » Drill the 12½-inch section of a highly deviated well in one run while minimizing risk of wellbore instability, poor hole cleaning, and packoff

SOLUTION

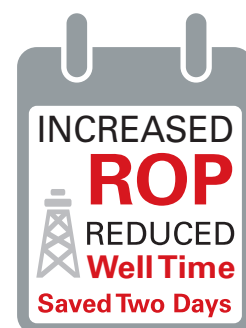
- » Geo-Pilot® XL RSS with a long-gauge bit design combined with an underreamer to maintain directional control, smooth wellbore geometry, and high ROPs

RESULTS

- » Drilled entire section in one run with no issues, saving 61 hours of rig time and USD 500,000

OVERVIEW

In a wellbore section that was notoriously difficult to drill, an operator needed a solution to drill the 4,921-foot (1,500-meter) 12½-inch section of an offshore Indonesia well in one run while building up to a 50° inclination. Due to the well's deviation and the heterogeneous formation that had interbedded layers of coal, unconsolidated sand, and carbonates, the operator faced many complex drilling challenges, such as wellbore instability, poor hole cleaning, and packoff. Sperry Drilling engineered a drilling solution that saved the operator 61 hours of offshore rig time.



OPERATOR NEEDS TO OVERCOME LOST-IN-HOLE AND NPT CHALLENGES IN HETEROGENEOUS FORMATION

When previously drilling in these challenging formations, several bottomhole assemblies (BHAs) had been lost in hole, leading to unplanned sidetracks and costly nonproductive time (NPT). Adding to these formation challenges, changing the mud weight was not preferred until a comprehensive geomechanical study could be completed – thus, hole cleaning and borehole stability could not be optimized. In addition, due to rig limitations, the flow rates could not be altered. With these limitations, and after losing three BHAs and observing several packoffs while backreaming out of hole, the operator turned to Sperry Drilling for both short- and long-term drilling solutions.

SPERRY DRILLING HELPS OPERATOR ENGINEER A DRILLING SOLUTION TO INCREASE DRILLING EFFICIENCY

Sperry Drilling collaborated with the operator to understand the challenges and deliver an engineered drilling solution with optimal directional control and hole quality while using the same drilling fluid and flow rate. By transferring local knowledge and experience from previous drilling operations, Sperry Drilling advised the operator to utilize the Geo-Pilot® XL rotary steerable system (RSS) with a long-gauge 10⅝-inch bit in tandem with an underreamer. The point-the-bit technology utilized in the Geo-Pilot RSS achieves consistently higher build rates in large hole sizes and in interbedded formations while maintaining better hole quality than a push-the-bit RSS. For this operator, as the rock alternated between soft and hard, Sperry Drilling optimized drilling operations with high surface revolutions per minute (RPM) to maintain steering and high rates of penetration (ROPs) without sacrificing hole cleaning. With an underreamer on top of the BHA, Sperry Drilling enlarged the hole from 10⅝ inches to 12¼ inches to increase the clearance between the BHA and the borehole wall, thus minimizing tight borehole issues and ensuring smooth

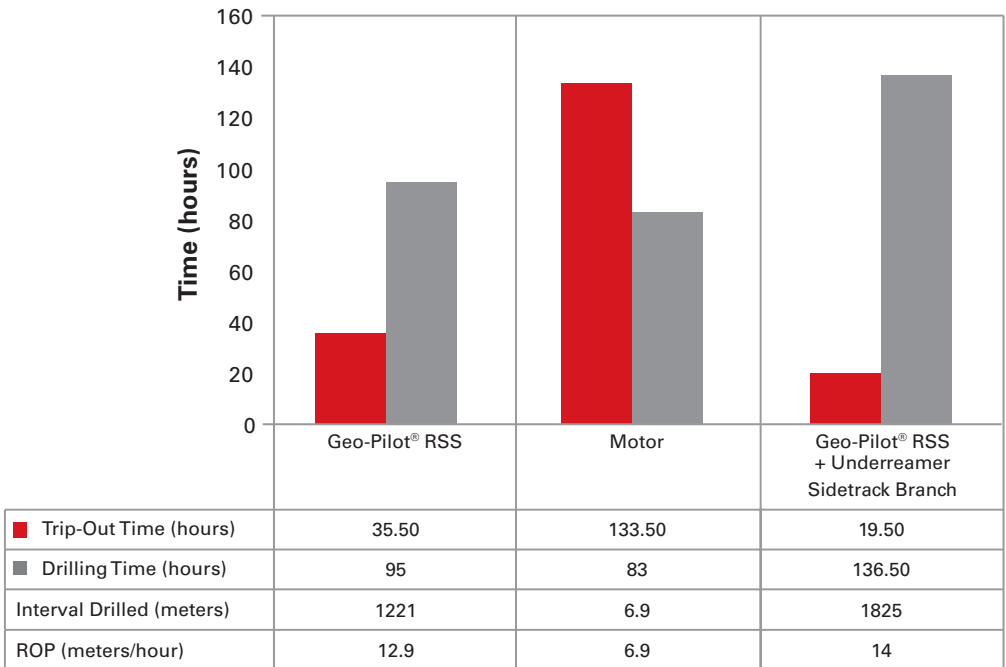
drilling and tripping in the coal layers and unconsolidated intervals. This underreaming configuration could be tripped inside the 13³/₈-inch casing without retracting the reamer, and allowed keeping a standard 9⁵/₈-inch casing size and centralization in a 12¹/₄-inch hole.

GEO-PILOT XL RSS PAIRED WITH UNDERREAMER MAXIMIZES DRILLING PERFORMANCE

With knowledge transfers from previous trips, Sperry Drilling utilized the newly engineered BHA to drill the entire 12¹/₂-inch section in a single run. The new BHA enabled the operator to reduce trip-out time by using an elevator instead of pumping out or backreaming. Compared to a previous RSS run, the new RSS solution improved the drilling interval from 95 hours to 136.5 hours, while increasing average ROP from 42 feet/hour (12.9 meters/hour) to 46 feet/hour (14 meters/hour), thus reducing well time in two ways – faster drilling and staying in the hole longer. In addition, the new RSS solution’s drilling performance offered greater improvements over a motor run. In the first well alone, these efficiencies reduced 61 hours of rig time valued at USD 500,000, setting a field record for trip-out speed. Together, the Geo-Pilot XL RSS, long-gauge bit design, and underreamer helped maximize asset value for the operator by increasing performance and reducing well time – setting the benchmark for drilling highly deviated wells in heterogeneous formations in the field.

Estimated savings: 61 hours of rig time / Equivalent savings: USD 500,000

BHA Performance Comparison in Well 1 (12-1/4-Inch Section)



The Geo-Pilot® XL RSS, with a long-gauge bit and underreamer BHA, tripped out of hole faster and drilled farther and longer than other drilling BHAs without affecting ROP.

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