Statoil Reaches Section TD in One Run in High-Well-Density Statfjord Field

PowerDrive Orbit RSS and collar RPM surveys enable improved hole cleaning.

**CHALLENGE**

Drill 8½-in section of reentry well in high-well-density environment with high packoffs; maintain high flow rate of 2.3–2.35 m³/min [14.5–14.8 bbl/min] required for hole cleaning.

**SOLUTION:**

- Improve hole cleaning with WARP‡ fluids technology, which contains micronized weighting material.
- Maintain directional control using the PowerDrive Orbit* rotary steerable system (RSS) in severe stick/slip and high flow rate conditions.
- Avoid nearby producing wells by conducting collar rpm cessation surveys with magnetic ranging technology.

**RESULTS:**

- Reached target TD of 950-m [3,116-ft] section in one run.
- Avoided close-proximity wells and ensured sufficient hole cleaning.
- Averaged 25 m/h while drilling the first 475 m [1,558 ft] of the section despite stick/slip severity of 90–100%.

Drill challenging reentry well from 42-slot platform

Statoil planned to drill a reentry well from one of its 42-slot offshore platforms in the Statfjord field, one of the largest and oldest fields on the North Sea continental shelf. Slot recovery had become challenging in this environment because of close-proximity wells and hole cleaning issues related to mud system limitations.

In this specific well, Statoil expected to encounter severe packoffs because of cement agitation in the 40-m rathole, located below the 9⅝-in casing shoe. Statoil needed an RSS capable of managing these conditions and efficiently drilling the 8½-in section on target.

**Use PowerDrive Orbit RSS to remain on target despite well collision risks**

After modeling the dynamic downhole conditions of the Statfjord field using VIRTUAL HYDRAULICS† software, Schlumberger experts recommended drilling the well with PowerDrive Orbit RSS and WARP fluids technology. This fluid contains micronized weighting material to improve hole cleaning and requires a high flow rate of 2.3–2.35 m³/min, which can cause standpipe pressure to exceed the limitations of conventional RSSs. Unlike a conventional RSS, the PowerDrive Orbit RSS is designed with metal-to-metal seals on the bias unit that expand the tool’s flow rate window.

**Reached section TD on target and in one run**

To avoid nearby wellbores and ensure sufficient hole cleaning, Schlumberger conducted collar rpm surveys rather than pump cycling. The collar rpm cessation surveys were coupled with magnetic ranging technology to allow Statoil to drill close to an offset producing well at a minimum separation factor of 0.18 and a center-to-center distance of 34 m [111 ft]. Statoil drilled the 950-m section according to plan and in one run.

Despite experiencing stick/slip severity of 90–100% in the first 475 m of the section, the PowerDrive Orbit RSS drilled the reentry well on target. As a result of the durability demonstrated on this job, Statoil plans to use the PowerDrive Orbit RSS in other reentry wells in this field.

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