Statoil saves big with new rotary steerable system

A NEW ROTARY STEERABLE system tool developed to improve drilling speed through difficult 12 ¼-in. formations saved operator **Statoil** more than $1 million on a single well in Norway's subsea development Asgard.

The tool was unveiled to the public in early March at the 2004 IADC/SPE Drilling Conference held in Dallas.

Remarked Statoil Manager of Drilling Technology **Roy Marker** of the Schlumberger PowerDrive vorteX system, "This is an example of how an oil company and service company can work together. The only way [for operators] to reach our goals is to work together with our preferred suppliers."

Mr Marker served on the IADC/SPE Program Committee for the 2004 conference.

ASGARD FIELD

Statoil's Asgard Field is one of the world's largest subsea developments. It lies in 365 m of water and comprises 60 subsea wells, three fields and 15 templates, Mr Marker said.

ROPs ranged as low as 6-9 ft/hour in the field's Lysing formation, where costs could run as high as $350,000/day.

Drilling the first well, Mr Marker explained, took about 40 days, with 12 different bottomhole assemblies.

Use of the new tool increased average ROP to 135.5 ft/hr from 65 ft/hr in the field, while cutting trips and big costs by 50%.

Statoil used the device in all 12 ¼-in. sections in the development, Mr Marker added.

The system was described by Schlumberger Business Development Manager **Paul Wand** as a high-torque, low-RPM device, especially intended for hard-rock formations.

The tool includes an inclination-hold function that allows a tangent or horizontal section to be drilled automatically, without intervention from the directional driller.

Mr Wand explained that this automatic downhole control enables higher ROPs and improved accuracy. The system can be stabilized at any of four locations along its length, he added.

Maximum speed at the bit is 220 rpm, and operating torque tops out at 22,000 ft-lb (30,000 N-m). Nominal OD is 9 ⅝-in., collar ID is 11-in. and the overall length is 50.6 ft.

The 8,900 lb tool can be used with a mzaximum weight on bit of 60,000 lb and a flow rate of 600-1,200 gal/min.

UNDERPOWERED RIGS

Mr Wand said that further applications for the system could include rigs with lower torque capability for directional drilling.

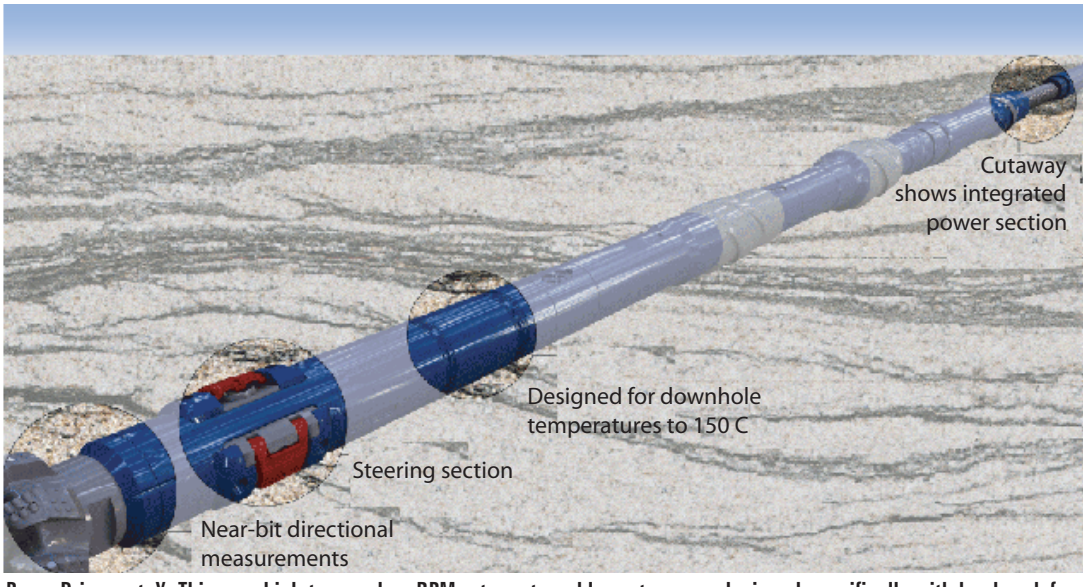
Mr Wand explained that, in particular, Schlumberger had in mind units such as Russian land rigs operating with aluminum drill pipe.

Due to the properties of the pipe, sliding during directional drilling is very difficult, if not impossible.

The tool is also said to reduce the risk of sticking, as well as wearing casing and drillstring.

Schlumberger is engaged in a followup project with Statoil, **BP**, and **Shell** to develop a 3 ⅛-in. version of the tool.

Tests should be completed on the device by yearend.



PowerDrive vorteX: This new high-torque, low-RPM rotary steerable system was designed specifically with hard-rock formations in mind. Also, developers Schlumberger say the tool could be used with rigs lacking sufficient torque to easily drill directional wells. Initially developed for 12-¼-in. sections, work on a 3-⅛-in. system is under way.