



Schlumberger, Halliburton debut landmark downhole systems

TWO MAJOR OIL service companies presented new products at the SPE/IADC Drilling Conference in Amsterdam last February that will increase production and reduce or eliminate potentially huge capital costs of optimizing wells and production capacity.

Halliburton Energy Services updated the industry on field trials of its Geo-Pilot 5200 series slimhole rotary steerable system, while **Schlumberger** introduced its new suite of while-drilling services dubbed Scope.

ROTARY STEERABLE SYSTEM

Halliburton announced the completion of two field trials of its slimhole rotary steerable system that adds slimhole capabilities to its FullDrift drilling suite.

The new slimhole system provides a drilling solution in 6-in. and 6 1/2-in. holes. There are market drivers for even smaller holes, as small as 3 1/2-in. or 3 1/4-in. but the market decreases at that point, at least presently, noted **Brady Murphy**, Vice President for Halliburton's **Sperry Drilling Services**.

The slimhole point-the-bit system can significantly extend horizontal production sections and reach small targets from existing structures, eliminating potentially huge capital investment and extending the life of production facilities by restoring production levels.

Rotary steerable are a \$500 million market and are experiencing about a 45% compound annual growth since 2000, according to Mr Murphy.

Rotary steerable systems can result in 50% higher ROP, although a 25% increase is more common with 3D rotary steerable and extended reach capability.

Market drivers for slimhole rotary steerable systems include mature field redevelopment, deepwater fields and complex well architecture and critical well place-

ment applications. Additionally, extended reach drilling from a single drilling pad can minimize environmental impacts of drilling operations.

The first field test of the Geo-Pilot 5200 series system was a test for an operator in Canada. The system drilled the entire section (2,445 ft) in 51 drilling hours. By choosing rotary steerable technology versus a conventional mud motor in the slimhole section of the well, the customer was able to eliminate the additional trip and rig time required to rearrange heavy-weight pipe commonly.

The second test was for an operator in Alaska where geosteering was required to maximize production from the horizontal reservoir interval. The slimhole rotary steerable system drilled the entire 7,145 ft horizontal in a single run, setting a world record for the longest run drilled with a rotary steerable in a 6 3/4-in. hole, according to Halliburton.

WHILE-DRILLING SERVICES

Schlumberger introduced its new while-drilling services for improved drilling performance and well placement. The Scope while-drilling service comprises three products: EcoScope multifunction logging while drilling; StethoScope formation pressure while drilling; and TeleScope high speed telemetry while drilling services.

EcoScope integrates drilling and formation evaluation sensors in one compact collar to deliver key drilling measurements plus unique measurements such as elemental capture spectroscopy and sigma. Drilling and formation evaluation sensors are integrated into one collar to increase efficiency and safety and replaces the traditional AmBe source with a pulsed neutron generator.

Japan Oil, Gas and Metals National Corporation (JOGMEC), formerly **Japan National Oil Corporation**

(JNOC), and Schlumberger collaborated on a research project to develop the technology that reduces the need for traditional chemical sources.

StethoScope provides formation pressure measurements in less time than it takes to make a connection, according to the company. Direct pore pressure and mobility data can be used for fluid typing, reservoir pressure management and mud weight control.

TeleScope telemetry while drilling service, when used with the Orion telemetry protocol, increases data transmission rates by four times compared with the industry standard, according to the company. The maximum industry standard, Schlumberger said, is 40 bits/sec depending upon conditions. Communication is simultaneously bi-directional enabling normal logging and drilling operations to continue during downlinking.

Statoil recently used StethoScope services on a platform in the North Sea with over 20 runs in well deviations from vertical to above horizontal with no unexpected amounts of seal failures in any deviation, according to **Harald Laastad**, an advisor for geo-operations and data acquisition for Statoil.

The service was used near its temperature limit of 150°C and in reservoir pressure exceeding 900 bars, including some fields with harsh drilling conditions with very consolidated abrasive formations. The tool provided Statoil with validated pressures in the mobility range of tenths of millidarcies to above 6 darcys/ep.

The pressure while drilling data provides the ability to optimize the mud weight, reducing the chance of kicks or losses.

He also said that Statoil has begun using the service as a wireline replacement in many of the company's extended reach wells that were previously logged.

Statoil drilled a high-angle well in the Tampen Spur area far from the main field. After the first wellbore was drilled it was decided to do a sidetrack to locate the top of the reservoir and have more distance to the oil/water contact, Mr Laastad explained. When drilling the sidetrack, StethoScope services provided formation pressures to ensure that the well did not enter a different compartment or pressure cell.

Statoil achieved an accurate pressure gradient even with complex well geometry, according to Mr Laastad, noting that the data from StethoScope matched the well log gradients "nicely." ■