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SUBSEA SYSTEMS

**FORMATION EVALUATION
HEALTH, SAFETY, AND ENVIRONMENT**

FEATURES

Unconventionals Breakeven Price
Frac Fleet Innovation
Offshore Well Control Rule
Drilling Drives Gas Flaring



Fig. 3—NOV's Nano 25 rotary shoulder connection offers a cost-effective alternative to tubing.

Rotary Shoulder Connection

National Oilwell Varco has released the Nano 25 connection, developed by the Grant Prideco business unit. This small-size connection was specifically designed to be fitted on 2 $\frac{7}{8}$ -in. pipe for use in intervention drilling (Fig. 3). A near-flush outside geometry promotes the use inside of 4 $\frac{1}{2}$ -in. tubing, and the enlarged inner diameter allows the use of drop-in actuation balls. The connection offers a cost-effective alternative to tubing and comes with a rugged connection design that can develop close to 9 kft-lb of makeup torque in a 3 $\frac{3}{8}$ - \times 11 $\frac{13}{16}$ -in. configuration. As a rotary-shouldered connection, it can be made up and broken out multiple times, and it can operate at almost double the amount of torque vs. previous connections.

► For more information, visit www.nov.com.

Continuous-Circulation System

While drilling surface sections from 40 to 1500 m in harsh drilling environments, including with total losses, the Non Stop Driller continuous circulation system from Adrilltech has reduced connection times from 40 to 10 minutes,



Fig. 4—The Non Stop Driller continuous-circulation system from Adrilltech has reduced connection times in harsh-environment projects.

thus saving between 15 and 21 hours in overall time spent drilling each section. Also, over the duration of the project, through reducing the risk of stuck pipe and lost bottomhole assemblies, the operator saved millions of dollars in potential charges and gained the benefits of early production from time saved (Fig. 4). Continuous-circulation subs are installed in every stand of drillpipe being used in the drilling process. A valve manifold diverts foam or air from the pumps to the topdrive while drilling and through the drillstring through the subs during each connection. The system comprises 33 subs preinstalled on the top of every stand being used to drill the section and uses a valve manifold to divert flow from the pumps to the connection valve in the subs while the next stand is being picked up. Throughout the duration of the project cited, the results have been a time saving of up to 40 minutes per connection. Some sec-

tions extended past planned total depth. Over the duration of the project, over 850 connections have been completed with a 95% success rate.

► For more information, visit www.adrilltech.com.

Casing Cement Breaker

A new abandonment tool developed from Deep Casing Tools has gone from concept to offshore trial in just 9 months. The prototype Casing Cement Breaker was trialed in a well on Equinor's Huldra field, in the Norwegian North Sea, as part of a plugging and abandonment program weeks after the operator's staff were introduced to the tool. The tool addresses problem cement in casing, which hinders conventional methods for plugging and abandonment and slot recovery, when operators want to extend production. The hydromechanical tool, which is run down hole on drillpipe, works using pressure and rotation to manipulate the existing casing in the well within its elastic limits, breaking down the bond between cement and casing as well as the structure of the cement behind the casing (Fig. 5). Well-abandonment methods are simplified or are no longer needed, saving operators significant time and cost and reducing risk and uncertainty. JPT

► For more information, visit www.deepcasingtools.com.



Fig. 5—Deep Casing Tools' Casing Cement Breaker allows simplification, or elimination, of traditional well-abandonment methods.