

TECHNOLOGY APPLICATIONS

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Fig. 1—Deep Casing Tools' Turborunner completion-reaming tool.

Reaming Tool—Deep Casing Tools has introduced its 5-in. Turborunner completion-reaming tool (**Fig. 1**). The tool is an independently powered high-speed tool, which was deployed recently in a horizontal application in the central North Sea. This completion-compatible reaming tool aids first-time placement of the completion equipment or liners at target depth. A 7-in. version of the tool was launched last year. The 5-in. tool was designed to support smaller-openhole-completion placement. It combines washing with rotational-reaming capability to avoid rotating the completion string itself. The very-low operating pressure is suited for integration with completion systems. In the North Sea project, placement of the liner was seen as a significant risk because of the instability of the sand/shale sequences in the long openhole section. The tool was run on a 5,500-ft-long, 4¹/₄-in. liner into a 6-in. open hole. Upon reaching planned depth, the tool and the liner were cemented in place.

For additional information, visit www.deepcasingtools.com.

Downhole Camera—Expro announced that the HawkEye IV camera has been added to its downhole-video portfolio. This camera communicates by use of downlink for easier access to

options with a simple command from the surface. The downlink enables the video operator to control the ViewMax light-head, so that switching from down view to side view and stopping or starting a rotation are accomplished with the press of a button rather than by voltage adjustment from the surface. With the turbo-mode option, the tool can increase its frame-acquisition rate from 1 frame/sec to as fast as 30 frames/sec. The images then are stored in the camera and transmitted by batch to the surface. The new camera can store 1,000 images. The higher acquisition rates are particularly well-suited for moving fluids, such as pinpointing fluid type and entry location or under-

standing flow regimes, to enhance understanding of production logs in horizontal wells. There is no limit to the number of turbo acquisitions during a survey. The camera is being field tested in Broussard, Louisiana, USA.

For additional information, visit www.exprogroupp.com.

Integrated Analysis—The RESnet FIELDPRO system is an open system that allows personnel of any operator or service company to perform integrated analysis for exploration and production activities, including geology, geophysics, drilling, completions, and production. This system allows “at-a-glance” evaluation and optimization of components, separately or together, by use of dynamic-visualization tools. Secure upload and download to and from most conventional or custom database systems enable using the tool as an interface to most company systems and/or as a stand-alone capability for business units and field operations. Interfaces to conventional third-party applications (e.g., reservoir simulation and production optimization) are complemented by onboard capabilities for rapid adequate practical simulations, including real-time analysis of activities. Examples include full-3D simulators (with no grid requirements) for analyzing complex multifractured/stimulated wells in multilayered formations (**Fig. 2**) and interfacing with state-of-the-art

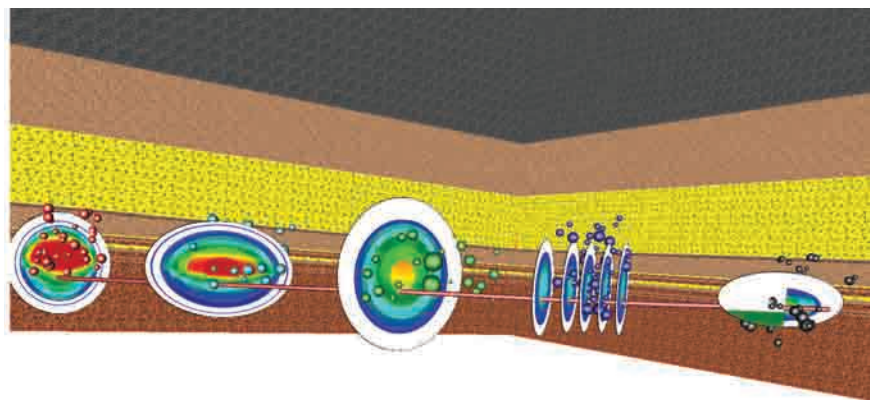


Fig. 2—RESnet's FIELDPRO 3D simulation image integrates aspects of multifractured horizontal wells.

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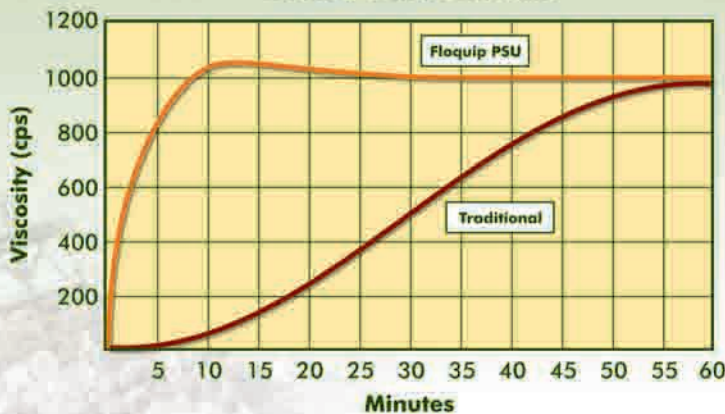
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Fig. 3—T.D. Williamson's SMFL inspection tool.

capabilities for completions and stimulation. Flexible production-data handling and analysis allow rapid iterative optimization and identification of successful methodologies, while a change is still possible.

For additional information, visit www.resnet.com/Fieldpro.

Flux-Leakage Inspection—T.D. Williamson has introduced its Spiral Magnetic Flux Leakage (SMFL) inspection tool (**Fig. 3**). The new tool enables detecting long and narrow defects in a pipe body and in long-seam welds. Transverse-field-inspection (TFI) tools are designed to detect only general corrosion, as well as long and narrow metal-loss features. This tool combines the capabilities of the standard TFI tool with those of a conventional axial-MFL system. The high-resolution tool requires only one magnetizer, enabling the tool to be paired with MFL technology without having to extend the tool's length. Pairing tools allows generating multiple data sets in a single run. Overlaying these data sets greatly enhances the characterization of anomalies that are revealed during an inspection run. For example, in recent runs with each system in a 16-in. pipe with a 0.250-in. wall thickness, the axial-MFL tool did not detect an external axial gouge. Data generated by the SMFL tool revealed an external gouge measuring 6 in. long \times 0.25 in. wide \times 40% deep. The new tool has a sampling frequency of up to 750 samples/sec, an operating-pressure range of 300 to 2,000 psi, and an in-line temperature range of 14 to 131°F. It has a



Fig. 4—Ecosse Subsea Systems' SCAR trenching plow.

minimum bend radius of 1.5 diameters and can travel at up to 8.3 ft/sec.

For additional information, visit www.tdwilliamson.com.

Underwater Plow—The Ecosse Subsea Systems' SCAR (**Fig. 4**) is a trenching plow designed to operate from vessels of opportunity, especially anchor handlers. No crane or A-frame is required for launch. The multipass plow's ability to make multiple cuts in the same trench without limit is unique. The plow can be operated in water depths to 3000 m. It can be set for 2-m trench depth (pipelines) or 3.4-m trench depth (cables). It has variable soil capability (i.e., clays, silts, and sands) and can be launched/recovered in high-sea states. Variable bollard-pull requirement is 25 to 150 tonnes, with onset of yield at 290 tonnes. With extra spoil-removal tooling, the plow can dig very deep trenches (10 m) for applications such as ice scour.

For additional information, visit www.ecosse-subsea.com.

Remotely Operated Top Drive—Weatherford's new remotely operated TorkDrive DT tool (**Fig. 5**) is part of the OverDrive system of top-drive casing-running and drilling tools. The new tool is smaller in size than its predecessors. This lighter version can be used efficiently on smaller land rigs where available space below the rig's top drive and the capacity to lift heavy tools to the rig floor are very limited. The company's automated casing-running system provides real-time hazard mitigation and eliminates personnel

in the derrick and on the rig floor. Eventually, the new tool will replace the company's existing drilling-with-casing (DwC) drive tools, providing a safer, more technically competitive alternative to existing drive systems. The new tool will make its field debut on an upcoming integrated-service project in Uganda, with the company's Defyer drillable casing bits to drill the entire surface and intermediate sections without any conventional bottomhole assembly or drillstring.

For additional information, visit www.weatherford.com/OverDrive.



Fig. 5—Weatherford's new remotely operated TorkDrive DT tool.

High-Performance Directional Drilling

Schlumberger's PowerDrive X6 is its latest rotary-steerable-system (RSS) tool (Fig. 6). Designed to bring RSS benefits to harsh well environments, it minimizes the effect of external environmental factors, increasing the operating envelope to handle higher mud weights, wider flow ranges and drilling dynamics, aggressive drilling mud, and debris. This push-the-bit RSS tool provides full directional control while rotating the drillstring, improving rates of penetration and increasing the accuracy of wellbore placement. Full rotation reduces drag, decreases the risk of sticking, and achieves superior hole cleaning. It also improves wellbore smoothness and decreases tortuosity, which, in turn, reduces drilling torque, eliminates unplanned wiper trips, and simplifies installation of completion equipment. In field tests, this RSS tool has drilled more than 1 million ft, with 32,000 operating hours. Operators have experienced more than 25% improve-



Fig. 6—Schlumberger's PowerDrive X6 RSS tool extends service to harsh well environments.

ment in reliability, most noticeably in smaller hole sizes. Its proven control system was deployed to provide precision steering for the company's

PowerDrive Archer high-build-rate RSS drilling service.

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For additional information, visit www.slb.com/powerdrivex6.

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