

## OTC Announces 2009 Spotlight on New Technology Award Recipients

The Offshore Technology Conference (OTC) has announced the 14 technologies that were selected for 2009 Spotlight on New Technology Awards, which recognize innovative technologies significantly impacting offshore E&P. The awards will be presented at 4 p.m. on 4 May at the conference, which takes place 4–7 May at Reliant Park in Houston.

This marks the sixth year for the Spotlight on New Technology program, which is designed to give exhibitors an opportunity to showcase their latest groundbreaking technologies. Winning technologies are selected on four criteria:

- New and innovative—The technology must be less than 2 years old.
- Proven—It must be proven, either through full-scale application or prototype testing.
- Broad interest—It must appeal to a broad segment of the industry.
- Significant impact—It must provide significant benefits beyond existing technologies.

The 2009 award recipients have met these criteria successfully and represent a diverse range of technology solutions.

### 2H Offshore

#### INTEGRISTICK Dynamic Curvature Sensor

2H Offshore's INTEGRISTICK Dynamic Curvature Sensor allows for high-precision monitoring of deepwater subsea structures, providing early warning of potential structural problems. The company says that use of this tool allows for the detection of problems before they become costly failures, potentially saving millions of dollars in operational downtime.

The INTEGRISTICK incorporates several strain gauges in a corrosion-resistant metal housing that measure biplanar curvature changes of subsea structures to a resolution of 1 micro-strain, creep-free. The device can capture the smallest bending moments of a structure during the field's life and provides information on how the structure reacts to harsh environmental conditions. The system can be used as a battery-powered unit or permanent online system and can be deployed by a diver or a remotely operated vehicle to water depths of 3000 m.

### Baker Hughes

#### TORXS Expandable Liner Hanger System

TORXS is a single integrated system that combines the benefits of conventional and expandable liner hanger systems in one tool. The system uses a variable-diameter swage to expand the

liner hanger before displacing cement or setting the packer, which Baker Hughes says is unique to the industry.

Expansion of the hanger component is easily controlled and does not reduce the system's annular flow. Packer setting occurs after displacing cement and does not depend on plug bump. The TORXS system is robust, with superior torsion limitations and balanced hydraulics such that the liner can be safely circulated down without risk of premature activation.

### Baker Hughes

#### Frac-Hook Multilateral System

This new tool by Baker Hughes' Oil Tools division allows operators fracturing tight gas wells to accurately pinpoint fracture placements and provides greater access and control of laterals. The system requires no cementing, and allows operators to achieve full mechanical support of the junction area and deploy the hook hanger with diverters in one trip.

The tool combines several proven technologies in one reliable multilateral junction with selective, high-pressure fracturing capabilities. Each separate component is a time- and cost-saving product on its own; in this combined form, they offer a stimulation system that improves initial productivity, accelerates reservoir drainage, and provides faster return on investment.



Fig. 1—The TORXS Expandable Liner Hanger System.

## Cameron-Nautronix

### NASMUX

NASMUX is an acoustic system providing full control for subsea blowout preventer equipment and offers an alternative to traditional multiplexed control systems. This acoustic system requires very little topside equipment and replaces the command, control, and monitoring aspects of a control umbilical. The system's small topsides footprint allows transfer between vessels to be done quickly and with relative ease, saving handling and transportation costs.

The system, a collaborative venture between Nautronix of Aberdeen and Cameron Drilling Systems of Houston, features individual control of 128 functions, digital readbacks, analog signals for information such as pressure readings, and several programmable sequences for single-command activation of sequences such as emergency disconnect.

## ProPure AS

### ProSalt

The compact ProSalt mixer system allows for better utilization of injected fresh water during crude desalting operations. The mixer combines freshwater injection with crude/freshwater mixing by imposing a homogeneous shear stress on the fluids. This results in a homogeneous freshwater droplet size distribution, which improves conditions for coalescence of the freshwater and saltwater droplets from the crude.

The system not only improves crude/saltwater separability, but it reduces the freshwater requirement and lowers demulsifier spend. The ProSalt is a compact, flange-mounted



**Fig. 2—The Reelwell Drilling Method.**

spool piece unit that can replace existing globe-valve mixers to debottleneck existing desalter plants. It can also serve as a mixer unit for grassroots installations.

## Reelwell

### Reelwell Drilling Method (RDM)

The RDM uses closed-loop fluid circulation to secure accurate pressure management and improved well control. The method is based on a concentric dual-drillstring closed circulation system and employs a dual float valve and piston to secure full-time pressure control during drilling and pipe connections. The piston prevents annular fluid from being lost and provides the downhole hydraulic weight on bit required for increased reach while drilling horizontal sections.

Reelwell envisions this system as a means of pushing through present limits in extended-reach drilling, and its accurate pressure management makes the RDM attractive for managed pressure drilling. The method may also push through existing deepwater limits through riserless drilling.

## Schlumberger Subsea Surveillance

### subC-strip and subC-collar

The subC-strip and subC-collar integrity-monitoring systems continuously monitor a flowline's buckle response to operational production cycles. These 600-ft sensors are attached to flowline joints in the region of a buckle and continuously monitor buckle shape, pipe axial, hoop strain, and temperature. Data are transferred to the surface via a field umbilical using a low-power optical modem communication system to the topside data-acquisition system.

The subC-strip uses a sensor strip that contains a series of embedded optical strain sensors which measure the curvature profile along the buckle. The subC-collar is a clamp design that fastens around the pipe using standard field-joint coating procedures. The embedded optical sensors are oriented in the axial and hoop directions to measure axial-strain and internal pressure fluctuations in the flowline.

## Specialized Products

### Pulse Technology—Battery Maintenance, Conditioning, and Charging

Pulse Technology extends fleet and equipment battery life by providing a novel solution to battery plate sulfation and related failure modes. The technology is implemented in Specialized Products' SP-25 solar charging product to create a comprehensive charging, conditioning, and maintenance system.

The combined SP-25/Pulse Technology system charges the battery and applies a high-frequency pulsing action to the surface of the battery plates. This pulsing is akin to an "electromechanical scrubbing" that removes and inhibits the growth of sulfation crystals on the surface of the plates. This has the effect of extending the battery life by up to 5 times, leading to greater fleet and equipment sustainability and a virtual elimination of down time due to battery-related failure.

## Technip France

### Amplitude-LNG Loading System (ALLS)

The ALLS incorporates a heavy-duty cryogenic flexible pipe designed by Technip France to provide more options for transfer of liquefied natural gas (LNG) in offshore and near-

shore marine environments. The flexible pipe is composed of internal stainless steel flexible bellows, which ensure compatibility with LNG and no leaks. An intermediate layer prevents ingress of humidity and provides a double annulus for instrumentation and leak-detection purposes. Finally, an external leak-proof layer renders the assembly water tight.

The ALLS operability was demonstrated and qualified in February 2008 through a comprehensive test program featuring dynamic testing and operated by GDF Suez Operators with LNG provided from an LNG tanker.

**US Synthetic Corporation,  
a Dover Company**

**Diamond Radial Bearings**

US Synthetic Corporation has developed a diamond radial bearing capable of operating in drilling fluid environments and lasting 2 to 8 times longer than tungsten carbide or other hard metal bearings. Polycrystalline diamond pads are formed, machined, and placed using patent-pending techniques to form a diamond radial bearing that runs smoothly on polished precision diamond surfaces. The company states that these bearings can withstand the rigors of drilling fluid lubrication and dynamic downhole environments.

The bearings, which are available in sizes from 1 to 10 in. in diameter, find application as the near-bit bearing set in mud motors and turbines and in power generation and rotary steerable tools. In both applications, bearing life and reliability were improved.

**VetcoGray, a GE Oil & Gas Company**  
**SEM5**

SEM5 is a fifth-generation subsea electronics module (SEM) for use in subsea production-control systems. The module reportedly offers new levels of open-architecture internet protocol-enabled communication capabilities through the application of a modular design approach.

A variety of modem options in terms of type and speed are available to satisfy customers' varying bandwidth and offset requirements. The SEM supports industry-standard interfaces (SIIS 1-3 and IWIS) and full sensor interface capability. A 32-bit microcontroller using a commercial real-time operating-system processing module can be fitted

as a daughterboard to any internal electronic module that requires processing power.

The SEM5 incorporates VetcoGray's design heritage to provide robust mechanical construction that meet shock, vibration, and temperature-cycle requirements of ISO 13628.

**Weatherford International**  
**OneTrip StarBurst Multilateral System**

Weatherford's OneTrip StarBurst system is the industry's first one-trip Level 4 multilateral system. It is well suited for wells experiencing production declines in mature fields. The system saves clients money by saving on two pipe trips, which equals approximately two days of rig time. Additionally, the whipstock remains in the wellbore after the casing exit window is milled, eliminating recovery risks and another pipe trip to retrieve it.

Additional benefits include enabling clients to reduce their surface footprint because they can minimize the size and number of platforms or wellsites to produce the reservoir. In some cases, the system allows the use of a single well to access multiple reservoir targets.

**Welltec**  
**Well Cleaner PST**

The Well Cleaner PST (Power Suction Tool) is a sand cleanout technology that is capable of lifting sand into long bailer sections that are up to one metric ton (approximately 500 L) per run. Conventional sand cleanout tools such as slickline bailers only recover 4-9 L of sand per run.

The PST takes in well fluids and solids, filters out the solids, and returns cleaned fluid to the wellbore. This flexible bailer system ranges from 3.5 to 7 in. outer diameter, and different inlet nozzles can be applied to pickup sand on the low side and break through any massive sand bridges that have built up. The tool also reportedly offers a cost benefit over so-called "heavy" pipe solutions due to less mobilization of people and equipment.

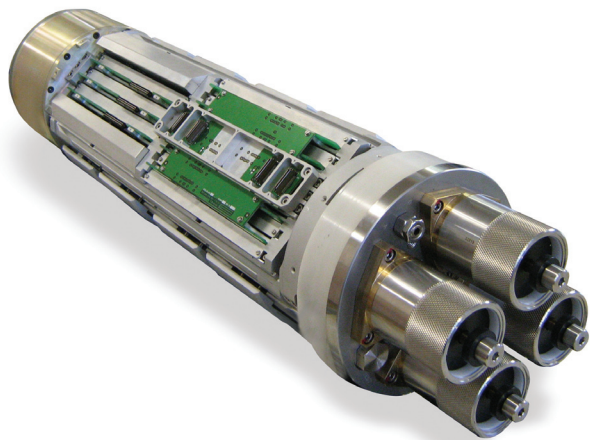
**WesternGeco, a business unit of  
Schlumberger**

**Coil Shooting**

WesternGeco's Coil Shooting technology acquires full-azimuth marine seismic data continuously with a circular geometry using a single seismic vessel. The technology enhances current multi- and wide-azimuth (MAZ and WAZ) acquisition techniques designed to provide better illumination, higher signal-to-noise ratio, and improved seismic resolution. While current MAZ and WAZ techniques require shooting surveys several times with one or several vessels, Coil Shooting enables complex surveys to be efficiently acquired with one vessel.

By sailing in large overlapping circles, a large number of shot-receiver positions can be created, allowing a single source/receiver boat to produce unprecedented offset and azimuth sampling which leads to higher quality images with superior noise suppression. Coil Shooting can incorporate the company's Q-Marine technology to maintain constant streamer separation while sailing, which results in efficient data collection that can address some of the challenges of imaging complex reservoirs.

**JPT**



**Fig. 3—The SEM5.**



# New Solutions Tailored for Drilling Optimisation

## Drilling Efficiency

- Is it possible to improve the ROP?
- Is the bit adapted to drilling conditions?
- How much longer can the bit stay on bottom?
- Are the correct drilling parameters being used?

## Hole Condition Monitoring

- Are all tight spots known?
- Is the well clean enough to trip safely?
- Is a wiper trip needed before going any further?
- Can we continue drilling at the same ROP?
- Is the wellbore stable with these mud characteristics?
- Do we have effective hole cleaning?

## Well Surveillance

- Is there any abnormal change in the mud pit trend?
- Where does this gas peak come from?
- Is the hole properly balanced to trip out safely?
- What is the ECD right now?

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**Thema™ SERVICE**