

OTC Announces 2008 Spotlight on New Technology Award Recipients

The Offshore Technology Conference (OTC) has announced the 14 technologies that were selected for 2008 Spotlight on New Technology Awards, which recognize innovative technologies significantly impacting offshore E&P. The awards will be presented at 4 p.m. on 5 May at the conference, which takes place 5–8 May at Reliant Park in Houston.

This marks the fifth 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 2008 award recipients have met these criteria successfully and represent a diverse range of technology solutions.

ABB Wireless Wireless Vibration Sensor

The Wireless Vibration Sensor allows for wireless transmission of process data to a central computer system, which performs data analysis and makes the data available to potential users. The unit comprises a vibration sensor (accelerometer), a temperature sensor, and the means for wireless communication to a central computer.

The cylindrical shape and 1.5-in. by 4-in. dimensions of the unit are similar to traditional wired accelerometers used in the industry. The sensor has a threaded hole on the bottom side, allowing for mounting on a motor close to a bearing. The unit is described as excellent for early detection of bearing failures, as its frequency response remains flat up to 10 kHz.

Wireless communication is achieved through the recently approved Wireless HART standard, which secures interoperability with other products and systems. Data sent between the sensors and the central computer are authenticated and encrypted, which safeguards system integrity.

Baker Oil Tools RAM Rotatable Self-Aligning Multilateral System

Developed for those extended-reach multilateral wells that require continuous rotation in order to place liners at the bottom, the RAM Multilateral System allows continuous rotation

of the lateral liner while simultaneously landing a completion system that can mechanically support the lateral junction.

Based on the field-proven HOOK Hanger platform and developed in conjunction with an international oil company, the RAM system delivers reliable multilateral junctions for Level-3 and Level-5 completions. The system also provides mechanical support for, selective control of, and access to all lateral junctions that join cased-and-cemented main bores with screened or lined openhole laterals in wells with commingled production.

INTEQ MagTrak

MagTrak technology is a logging-while-drilling (LWD) service that provides a range of magnetic-resonance measurements, including formation porosity, bound-fluid and

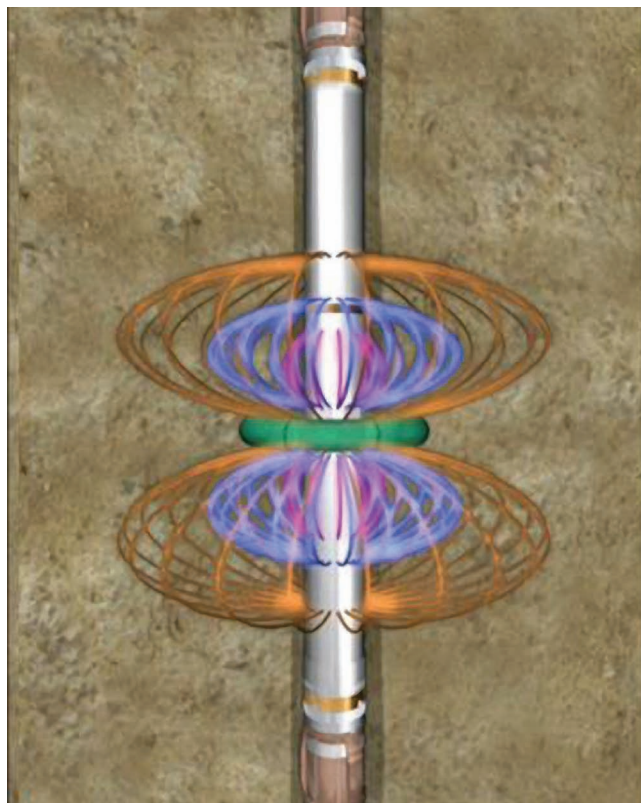


Fig. 1—The MagTrak LWD tool.

free-fluid volume, permeability, hydrocarbon detection, and T1 and T2 distribution spectra. Porosity measurements are not dependent on formation lithology, and because the tool incorporates magnetic-resonance technology, it does not require a radioactive source.

By delivering real-time T2 distributions, the technology allows asset teams to make informed decisions while drilling in order to optimize wellsite efficiency, safety, and hydrocarbon recovery. The service also identifies potential borehole problems by clay typing, allows for earlier input to improve perforation programs based on permeability index, identifies missed pay in low-resistivity formations, and allows for geo-steering into desirable production pay zones.

The service is available as a standard 6³/₄-in.-collar-based tool, fully integrated with rotary-steerable systems such as AutoTrak, and can be employed in borehole diameters from 8³/₈ to 9⁷/₈ in.

Cubility Mudcube

Mudcube is a patented drilling-fluid cleaning system incorporating a continuous rotating-screen belt to separate fluids from drilling solids in a closed underpressurized system.

Drilling fluid enters a rotating screen in which a vacuum beneath the screen draws the fluid through it and into a closed-loop fluid system. At the same time, the vacuum degasses the fluid, and the gases are evacuated through a vent line.

The solids are collected on the moving screen and dry as they move to the end of the screen-belt path, where they fall off. Any remaining solids are cleaned from the screen with an air knife as the screen rotates back to accept more drilling fluids. In this way, the system ensures that the return drilling fluid will always enter a clean screen.

The system has a low weight, high filtering capacity, wide operating window, low noise and vibration, and requires no application of mechanical force to the screen.

Delmar Systems OMNI-Max Anchor

Delmar's OMNI-Max Anchor for mobile-offshore-drilling-unit (MODU) moorings is a gravity-installed vertically loaded anchor (VLA) technology that provides greater anchoring flexibility vs. conventional deepwater anchor systems. The new VLA can be loaded onto a MODU in any direction, 360° around the axis of the anchor. During deployment, the

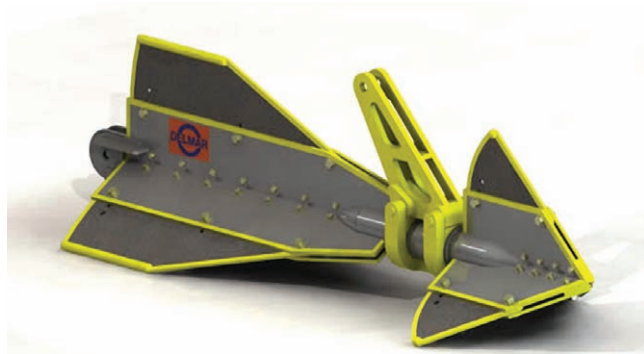


Fig. 2—The OMNI-Max anchor for MODU moorings.

mooring-line attachment can rotate around the entire body of the anchor, which reduces the risk of catching the line on the anchor plates.

Unlike other gravity-installed anchors, the OMNI-Max does not require significant penetration into the soil to generate adequate holding capacity and demonstrates sufficient holding at a penetration just beyond its full length.

In the event of station-keeping failure, the mooring lines are designed to break at the fairlead before anchor capacity is reached, thus preventing the rig from dragging anchors across seafloor assets. If one anchor line should fail, the remaining anchors can rotate and adjust their position to compensate for the load change, thus improving the chances of maintaining station with the rig.

Expro ViewMax sideview camera

ViewMax is a downhole video camera that helps operators make remediation decisions, particularly in wells with suspected casing damage. The new camera design incorporates two cameras in a slim package assembly, one to provide a traditional downward view and a motorized side camera that can rotate 360°, thus allowing unobstructed views of the pipe or formation wall. The operator can alternate quickly between these views with the flick of a switch.

The downhole camera system is packaged in a 1¹¹/₁₆-in.-outer-diameter (OD) assembly and is designed to operate on fiber-optic video cable or virtually any conventional electric-line logging unit. The side camera assembly has an OD of 2¹/₄ in., making it significantly smaller than other side viewing or pan-and-tilt cameras on the market.

The camera can operate at pressures up to 10,000 psi and temperatures up to 257°F (125°C) and is recommended in applications such as subsea-wellhead inspections or counting of threads between joints to determine backoff or an overtorqued condition.

FMC Technologies Enhanced Vertical Deepwater Tree (EVDT)

The EVDT is a compact subsea-tree system that allows ultradeepwater completions to be performed from a small drilling rig containing a surface blowout preventer (BOP). This installation option avoids the need for a deepwater rig and subsea-BOP system and can save an operator up to USD 15 million per well by allowing a deepwater rig to be used for drilling operations only.

The tree is classified as a slimbore subsea completion system, but is designed to provide large-bore system capabilities. The bore of the system can accommodate 7-in.-tubing completions and pressures up to 15,000 psi within a 13⁵/₈-in. BOP stack.

The tubing hanger can be installed with a tubing head when flexibility for sequencing of events is required during offshore installations. Alternatively, the tubing hanger can be installed directly into the wellhead without a tubing head, which eliminates the need to retrieve the subsea BOP and riser prior to drilling and completion operations.

The tree also incorporates a retrievable flow module and flowmeter into its design, which reduces production downtime for maintenance and meter replacement from several days to hours.

Enhanced Vertical Deepwater Tree (EVDT)

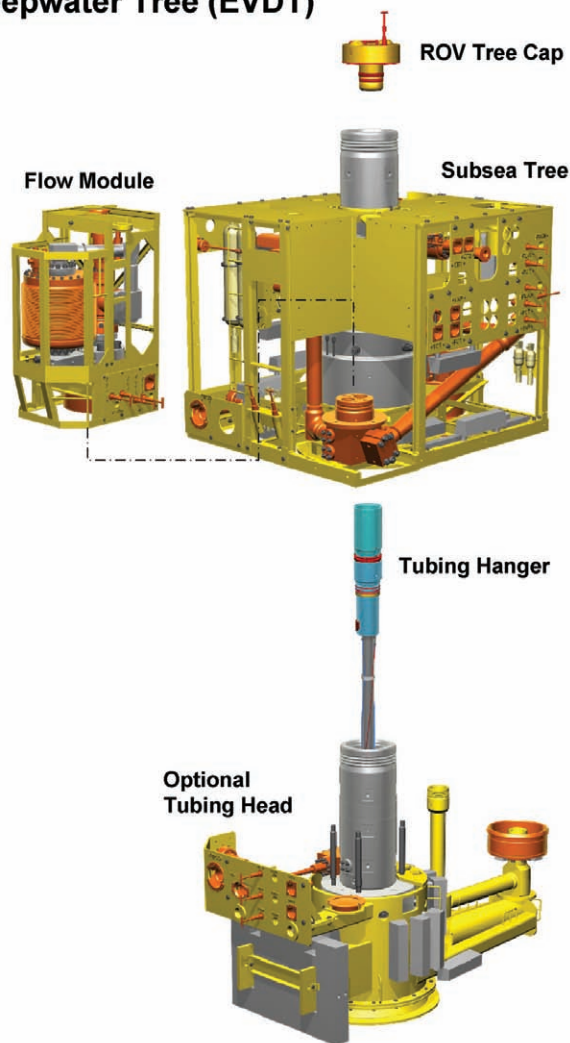


Fig. 3—The EVDT compact subsea-tree system.

Schlumberger FUTUR Active Set-Cement Technology

FUTUR active set-cement technology is a self-healing, fast-setting cement that provides a gas-tight hydraulic seal for casing-isolation operations. In conventional casing cements, microannular cracks may develop over time, leading to surface hydrocarbon leaks or sustained casing pressure. The new active set-cement is different in that when it contacts any hydrocarbon-based liquid or gas, the cement quickly reacts to seal flow paths around or within the cement sheath.

Should the leak redevelop as a result of additional changes to the local stress field, the cement will reactivate and seal the leak to re-establish hydraulic integrity, without the need for intervention from the surface.

The cement formulation is mixed and pumped with standard equipment as part of a primary-cementing operation and can be spotted strategically where needed, rather than requiring placement over the entire cemented interval. Its upper temperature limit is 280°F (138°C), and slurries can be mixed in weights ranging from 11.7 lbm/gal to 16



Fig. 4—The ResInject well-production management system.

lbm/gal (1.4 kg/L to 1.92 kg/L). In addition to microannuli, the cement can seal cracks or other hydrocarbon leak paths, even in critical areas such as liner hangers.

Schlumberger ResInject Injection Control Device

ResInject is a well-production management system that optimizes injection in openhole completions by equalizing the injection rate along the entire length of the wellbore.

The device is placed at the upper end of a screen wrapped on an unperforated base pipe. Injection fluid enters the device housing and flows through erosion-resistant ceramic metering nozzles into the screen section located between the screen jacket and the base pipe, before flowing out into the reservoir.

The device removes the flow-control interface from the screen surface to a controlled environment and subsequently changes the flow regime from the traditional Darcy spherical-flow-shape factor to viscosity-independent Bernoulli flow. The nozzles can be configured to control injection flow rate, thus fine tuning the pressure drop across the system for the zone to be treated. In this way, thief zones can be starved and low-permeability zones can receive more fluid than they would from a conventional screen.

By directing injection fluid to the zones that need it most, oil-recovery rates are increased.

The equipment is robust and is designed for a minimum 20-yr life. No special handling is required as compared to other sand-control media, and there is no need for permanent well instrumentation. The tool has no moving parts or control lines to install.

Versabar Bottom Feeder

Bottom Feeder is the nickname for Versabar's new custom heavy-lift system for platform salvage operations. The system can lift the topsides of a toppled platform from the seabed in a single piece and set it directly onto a cargo barge for transportation and decommissioning activities onshore. Compared to a multitrip piecemeal removal, the custom-lift

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system is more cost effective, resulting in lower personnel exposure offshore and a lower risk of hydrocarbon release into an uncontrolled environment.

The system was designed for single lifts in water depths up to 400 ft, with a maximum safe lifting capacity of 4,000 short tons. Lifting is completed by applying four independent blocks, each rated with a lift capacity of 1,000 tons. These blocks may be operated in synchronous mode or independently, and they hang from two rigid space frame truss structures spanning from hinged supports on the centerlines of two regular deck transport barges. The support hinges are designed to decouple the heave, pitch, and roll motions of the support barges from the lift structures.

Since its inception in mid-2007, the custom lift system has retrieved six Gulf of Mexico platforms that were toppled during the 2005 hurricane season. Each of the eight-leg topsides was retrieved intact as single lifts with peak lift weights of 1,600 tons. The total time period between initial hookup to deck to the cargo barge leaving the site with the recovered deck was less than 12 hours.

Weatherford

MetalSkin Monobore Openhole Liner System

The MetalSkin monobore openhole liner system eliminates the slimming of a well profile during well construction to improve well productivity and reservoir recovery. The installation process calls for an oversized shoe to be run into the hole with the previous casing string. After it is installed at the string bottom, the oversized shoe is drilled out with conventional bottomhole drilling assemblies.

After the next hole section is drilled, the expandable liner extension is run to total depth of the well and expanded back into the oversized shoe. This technique provides an expanded string of casing with the same drift as the previous string, and therefore no loss of hole size occurs.

The system reportedly reduces installation risks, minimizes well-construction costs, and mitigates drilling hazards. By providing a full bore in the overlap between the monobore openhole liner and the parent casing, the design reduces operational risks by eliminating the need to overexpand the shoe track to receive the expanding MetalSkin system.

Weatherford

Motorized Cutting Tool

Weatherford's motorized cutting tool (MCT) is a radio-safe, nonexplosive cutting device that cuts tubing under compression from the inside out. The electrohydraulic tool can be transported and operated without the restrictions imposed on explosive or chemical devices.

A rolling cutter is employed to cut the tubing cleanly, without deformation or flaring and with no debris left in the well. Each cut can be completed in a matter of minutes, and the device can make multiple cuts in a single run. This allows an operator to retrieve sections of tubing from the well in a fraction of the time required in explosive or chemical cutting operations. In addition, associated costs with service-company standby are reduced.

The device can be deployed downhole on $7/32$ -in. mono-conductor electric line, and can be run electrically with standard surface equipment.



Fig. 5—The Taisun gantry crane.

Welltec

Well Miller Circulating Bit

The Well Miller circulating bit is an electric-wireline intervention tool that drills through crystallized mineral deposits (carbonates, salts) that may collect in the wellbore. The bit mills through and removes the debris without the use of a drilling rig or coiled tubing unit, thus restoring full flow conditions in the well.

The tool is operated in conjunction with Welltec's Well Tractor, which provides weight on bit and controls the reactive torque of the drilling process. The tool consists of a basic rotational unit (BRU) that incorporates electronics, pressure compensator, and electric motor sections. The BRU drives an impeller that creates the vacuum flow that circulates through the liquid environment and draws sand into $1/2$ -in. intake holes for deposit in sand-trap bailers.

Depending on the configuration of the tool and the amount of deposits to be removed, a different number of bailer sections can be mounted.

Yantai Raffles Shipyard

Taisun 20,000-Tonne gantry crane

The Taisun is reportedly the world's largest gantry crane, with a single lifting capacity of 20,000 tonnes and operated and designed by China's Yantai Raffles Shipyard.

The crane sits across a 380-m by 120-m dry dock and is made up of two fixed beams, placed horizontally across the dock floor on four columns. The two beams each have a lifting capacity of 10,000 tonnes and are placed at heights of 89 m and 119 m, respectively. The crane's lower beam has a lifting height of 83 m, while the higher beam has a 113-m lifting height. The crane is equipped with automated controls that adjust the position and movement of heavy loads to prevent structure twisting or tilting past safe limits.

With the heavy-lift capacity this crane provides, the company envisions building complete deck boxes on the ground rather than moving individual pieces onto a hull or pontoon in several trips. This will add greater efficiency, speed, and safety to the manufacturing process, while also providing cost savings and freeing up space in the yard for other projects.

JPT