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Next up: West Africa presalt



Martin Kelly, Wood Mackenzie

The seemingly never-ending discoveries in presalt Brazil have spurred the industry to consider presalt plays elsewhere in the world. There are a number of ingredients in place for deepwater presalt success in West Africa. The prolific presalt reservoirs found in Brazil were deposited when Africa and Brazil were joined (as part of the prehistoric continent known as Gondwana), and the same horizons exist on the African side of the Atlantic. Presalt reservoirs have long been a part of Africa's upstream success, with big onshore discoveries such as Rabi and M'Boundi in Gabon and Congo, respectively.

Angola's long-awaited 2010 licensing round awards, announced in January this year, have added to the growing hype surrounding West Africa presalt, and any day now we anticipate the IOCs that were awarded blocks in this round to sign production sharing contracts (PSCs) with national oil company Sonangol P&P, which has a stake in all 11 blocks awarded.

The round was launched quietly in mid-2010, by invite only, and comprised mainly well-established players in Angola. All of the awards were made to major IOCs, with the exception of Cobalt as the only independent. The blocks are all located in the Kwanza basin in the southern part of Angola, believed to be the most prospective presalt area. The most highly sought-after blocks were understood to be 19 and 20, awarded to BP and Cobalt, respectively.

Discoveries have already been made in the presalt in the onshore Kwanza basin. But there are still major uncertainties. The quality of the carbonate reservoirs being targeted in Angola is the main risk (similar to Brazil prior to the discovery of Tupi). Few wells have ever reached the presalt in deepwater Angola; the most recent was Mobil's Baleia

See *West Africa*, page 29

OTC dinner benefits Gulf Coast restoration

By Pramod Kulkarni

A year after the sinking of the *Deepwater Horizon* semisubmersible and the Gulf oil spill, a capacity gathering of over 1,000 OTC delegates, local dignitaries and their spouses joined OTC Board of Directors Chairman Susan Cunningham in paying a memorial tribute to the 11 oil workers killed in the incident. The audience applauded when Cunningham (senior vice president exploration for Noble Energy) announced a contribution of \$200,000 to support the coastal restoration projects of the Gulf of Mexico foundation.

The signature event, which took place Sunday evening at the George W. Bush ballroom of the George Brown Convention Center in downtown Houston, also presented distinguished service awards. Dr. Cortis (Cort) Cooper, a metocean specialist with Chevron Energy Technology Co., was recognized in the category of distinguished achievement for individuals. BP Norway received an award for distinguished achievement for companies. ExxonMobil Development Co. garnered a special citation for its "Design One, Build Multiple" philosophy for fast and efficient implementation of major deepwater projects in Angola's Block 15.

"One year ago, the offshore industry was rocked by a tragic event in the Gulf of Mexico. In a desire to give back to the communities and to support the offshore industry, the idea of an annual dinner and fundraising event was born," said T. Jay Collins, president and CEO of Oceaneering, who served as the chairman of the dinner. Referring to the dinner's theme, "A Sea of Possibilities," Collins said the event was designed to bring



The new Annual OTC Dinner was sold out Sunday night. Pictured here: Marc Rubin, OTC; Houston Mayor Annise Parker; OTC Chairman Susan Cunningham from Noble Energy; Steve Balint from Shell International E&P, the incoming OTC chairman; and Stephen Graham, OTC.

together "leaders from across the world for a signature evening that could kickoff OTC, one that could honor OTC distinguished award winners, and one that could raise funds each year for an organization that serves a vital purpose for the offshore community – an event that could grow, year after year."

"I am always impressed with the creativity, professionalism and heart of this great industry. Sharing and working together

See *OTC Dinner*, page 27

BOEMRE to extend regulations to offshore contractors

By Nell Lukosavich

Michael Bromwich, head of the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), announced at a standing room only audience Monday OTC luncheon that the Department of the Interior (DOI) will begin to regulate offshore oilfield contractors and service companies, in addition to the operators. Bromwich also announced his agency's intention to work with deepwater regulatory agencies in rest of the world to develop a consistent set of regulations for deepwater drilling activity throughout the world.

Bromwich explained that after conducting a comprehensive analysis of the events following the sinking of the *Deepwater Horizon* semisubmersible and the Gulf spill, BOEMRE has determined that it has "broad legal authority over all activities relating to offshore leases,

whether it is engaged in by lessees, operators or contractors." Bromwich did not give a date on which BOEMRE would begin its new regulatory initiatives.

Bromwich did announce several other changes and initiatives to be undertaken by BOEMRE. Beginning on October 1, 2011, offshore regulation in the US will be carried out by three separate agencies within BOEMRE. The Office of Natural Resources Revenue will be responsible for collecting revenue from offshore resources. The Bureau of Environmental Management (BOEM) will promote resource development on the Outer Continental Shelf (OCS). Lastly, the Bureau of Safety and Environmental Enforcement (BSEE) will enforce environmental regulation on the OCS. "This structure is designed to eliminate the inherent conflict that existed when MMS was responsible for promoting resource development, en-



Michael Bromwich of BOEMRE spoke to a standing room only crowd at a luncheon on Monday.

See *BOEMRE*, page 3

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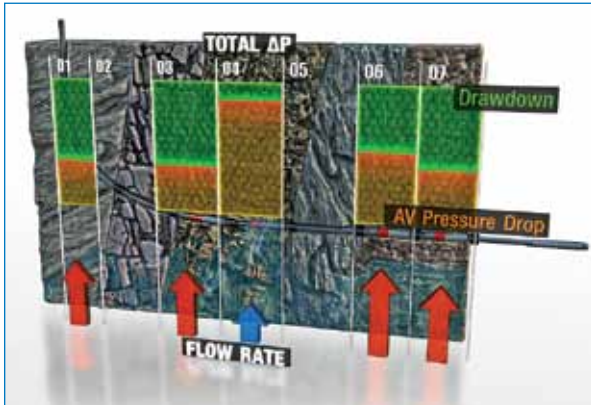
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Autonomous valve controls production

Operators all over the world have for some time recognized the benefits of horizontal completions due to this technique's ability to maximize reservoir contact for more efficient drainage of the pay zone. Made possible by advances in direction drilling technology, horizontal completions are especially favored in narrow oil-bearing formations.

Maximizing production efficiency in long horizontal completions has, for a variety of reasons, been



Water flux greatly reduced and total oil production stimulated with installation of EquiFlow autonomous valves.

problematic in both homogenous and heterogeneous reservoirs. Homogenous reservoirs are often subject to "heel to toe" effects wherein a higher drawdown is seen at the heel, resulting in very uneven production contributions, which in turn lead to coning of unwanted production, be it water or gas. In heterogeneous rock, there is an imbalance in production favoring (as one would expect) streaks of higher permeability over lower-permeability rock. These high-permeability streaks cause large variances in fluid influx from zone to zone, resulting in premature water and gas breakthrough.

This unwanted fluid production has significant detrimental impacts on production economics. First and foremost, water or gas occupies volume in the tubing that would otherwise be available to flow oil, thus reducing oil production. In the worst-case scenario, such production has resulted in the loss of the well altogether. In addition, the handling, separation and subsequent disposal of these fluids is expensive and may pose an environment hazard.

It has become increasingly more common for operators to install inflow control devices (ICDs) throughout the completion to address these problems in order to delay the breakthrough of unwanted water or gas production. ICDs accomplish this by creating a pressure drop along the completion string. While sig-

nificant gains in production efficiency and recoverable reserves have been realized, first-generation ICD tools only delay the onset of breakthrough; they do nothing to reduce the amount of unwanted fluid produced once breakthrough does occur.

To address these concerns, Halliburton is introducing its second-generation ICD, the EquiFlow autonomous valve, at OTC 2011. Initially, the valve functions as a conventional ICD. Upon breakthrough of water or gas, the tool senses what fluid is present and directs it up one of two pathways based on dynamic fluid properties. The oil path allows for relatively unrestricted production, while the water or gas path greatly increases the pressure drop in the tool, thereby restricting unwanted production. In some cases, the device restricts unwanted production up to 90% compared to what would be seen with a conventional ICD.

This functionality is realized with no moving parts, no need for downhole orientation, no connection to the surface or intervention of any kind. This not only increases total production over the life of the well, but also greatly reduces operating expense associated with unwanted fluid handling and the associated potential environmental concerns.

To learn more, visit Halliburton at OTC Booth #2777. •

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PRESS CONFERENCE WEDNESDAY, MAY 4 AT 8:00 A.M.
Held in Room D1 at Reliant Center, Next to OTC Press Room

Siemens expands its subsea footprint

The depletion of onshore reserves is forcing oil and gas companies to exploit fields in the remotest places at ever greater water depths. However, the tremendous water pressure in subsea environments leads to a recovery gap that can be as high as 30% compared with traditional surface wells. The Siemens subsea power grid is an enabler in closing this gap, opening the way for full-fledged subsea processing.

Subsea power grids are a key solution to enable subsea production. Power grids on the seabed need to deliver about 36 kV over fields up to 250 sq km in area, at a water depth of 3,000 m, to allow cost-efficient operation of large subsea production facilities with multiple consumers such as variable speed drives and compressors.

The Siemens solution, mounted on a base frame directly on the seabed, extends to the subsea environment the company's role as a technology leader for land-based power transmission and distribution. The Siemens subsea power grid will be available for deployment by late 2012 or 2013.

In March 2011, Siemens has strengthened its position in this technology area by acquiring the two subsea specialists Poseidon Group AS and Bennex Group AS from Subsea Technology Group AS, Norway. Bennex is one of the leading suppliers of subsea distribution (hydraulic and electrical) systems, fiber-optic, electromagnetic and seismic applications. Poseidon is a subsea engineering and consulting company capable of marinizing existing Siemens equipment and technology to the subsea environment, such as subsea control systems, transformers, switchgears, electric motors automation and compressors, along with other elements such as subsea electric valve actuators.

Full-scale subsea processing is a vital component in enabling the commercial viability of fields that will be brought on stream in the coming years around the globe in places such as the Americas and West Africa.

Siemens has accumulated extensive experience in subsea applications. The company's subsea solution includes transformers, switchgear and variable speed drives along with other elements to power and control electrically driven pumps, compressors and other processing equipment. Siemens is already active in marinization of equipment such as the STC-ECO compressor, which completed a comprehensive factory test program in August 2010. •