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Deepwater the Key to Future Large Discoveries


Transocean's *Deepwater Nautilus* semisubmersible unit drilled the Appomattox discovery well for Shell in 2010.

From Vienna (MT): Deepwater has been dramatically impacted by the industry's sustained downturn, but according to Eni's head of global exploration it represents and remains by far the offshore industry's biggest opportunity to access new reserves.

Capex in the deepwater sector has unsurprisingly plummeted over the past couple of years—last month analyst Douglas-Westwood forecast spending on deepwater projects at $137 billion between now and 2020, a 35% fall compared to its own figures from March last year *(33/4)*. Of that total spend figure, subsea production equipment; subsea umbilicals, risers and flowlines; pipelines; and trunk lines represented 34%.

But realistic optimism abounded at the annual gathering of explorationists organised by the European Association of Geoscientists and Engineers (EAGE) in Vienna, Austria.

Falling entirely coincidentally the same week as all the VIPs from OPEC also descended on Vienna for that cartel's regular meeting to essentially decide on changing nothing regarding its output ceiling, some of the world's leading explorers were in full agreement on one thing—deepwater is where it's at in terms of large future discoveries.

An immature play

Industry veteran Luca Bertelli, chief exploration officer at Eni, pointed out that deepwater had been the base of the majority of large discoveries in past years and that it would continue to do so. "Deepwater will remain the main source for significant discoveries for the industry in the future," he said, stressing that the industry would need, however, to at least do two things: drill less but more valuable wells, and explore, develop and produce projects more efficiently.

Ceri Powell, Shell's executive vice president of global exploration, agreed, observing that with only 7% of the world's oil produced currently coming from deepwater, "It's still an immature play. There's 270 Bbbl recoverable reserves out there in deepwater, according to the International Energy Agency."

With the industry reducing the deepwater breakeven price towards less than $50/bbl, Powell added that further advances in seismic would help achieve better success rates, while a "direct enabler" for further developments would be increasing amounts of deepwater infrastructure, allowing easier connection of discoveries to existing networks.

New geological concepts, such as that proven by Shell in the eastern Gulf of Mexico on its Norphlet Trend, would continue to also access fresh reserves, she continued. The Jurassic period formation already has produced sizeable deepwater discoveries for the operator such as the **Appomattox**, **Vicksberg** and **Rydberg** fields.

WHAT'S INSIDE

"Who would have thought just a few years ago that the Eolian and Fluvial sands would have produced these?" she added with excitement that only geoscience folk can truly empathise with. But it produces tangible results and investment; Shell is of course initially developing Appomattox, which will be produced by a semisubmersible production facility linked to a subsea system with six drill centres, 15 producing wells and five water injection wells.

Mature basins

Eni's Bertelli also flagged up the important role that mature basins would play in making small incremental discoveries, both in deep and shallow waters, and tying them back to existing infrastructure. "With this kind of exploration, it's very important that the explorers do not work alone but with the asset production and operations teams. They can make small, incremental discoveries and tie them back in just a few months. But this provides really good value returns."

It wasn't all sunny talk and silver linings, of course. The very first thing Shell's Powell pointed out in EAGE's opening panel discussion was that there will be "74% less wells drilled in 2016 compared to 2014."

Eni's Bertelli told delegates not to expect high oil prices to return, describing the high price environment of recent years as "an anomaly" with today's levels more the norm. "Before that period of high prices the industry had been working at lower price levels and everybody was happy. What changed during the high price period was the cost. Now the price has dropped—it's currently 50% less than it was last year—but the average cost drop is about 25%, no more than that. So there's a big gap between the price of the oil and the cost. We cannot control the price, but we can control our costs, so we need to work together to further lower industry costs and reset the cost structure."

He went on, however, to frankly describe the E&P sector as having already been "in crisis" before the price began its plunge. "If we look back at this cycle, we had the lowest number of exploration discoveries in 50 years. Last year we discovered even less because global exploration was cut by around 30% on average." With a lack of big discoveries over the past three years, he said, it was clear "there was already a crisis in exploration. And then the price slump came."

Shell's Powell did highlight emerging evidence that the industry is turning the corner on costs. "I have been very encouraged by how we have cut drilling costs, with deepwater wells, for example, now being drilled for much less than $100 million per well in some parts of the world. It's also about efficiency, about how many days it now takes to drill those wells. We are still not drilling enough at present, but we are now doing it very efficiently."

Windfall projects

Tim Dodson, Statoil's executive vice president of exploration, highlighted how the industry had to a certain extent used the time of higher oil prices to develop and produce older discoveries as "windfall projects" that previously had not been economic to develop.

"But most of us are starting to struggle with our resource base. Not our actual numbers but what makes them up. It's an area of some concern. They are at the wrong end of the cost curve. There's an absolute need for the likes of us all to explore, but the fundamental challenge is delivering sufficient volumes."

He also stressed that anyone who thought large oil companies could replace their significant production levels by exploration alone "was living in dreamland." There is a need to acquire as well, he said. But it will be crucial that companies ensure they acquire the right quality of asset. Although relatively little M&A [mergers and acquisitions] activity is happening at present, said Dodson, "I think we will see more in this 'lower for longer' situation."

What the industry is really lacking, he added, was "enough new good ideas. We can easily get swamped by the need for efficiency and controlling costs. But how can we come up with more and better ideas?"

Costs vs. sustainability

There was a service company on the panel too, of course, to add a dose of extra realism.

Jean-Georges Malcor, CEO of CGG, spoke from a supply chain perspective, "Here are some numbers on the seismic side. For the last three years we have been squeezing down costs. There has been a fall of between 50% to 60% in our costs. The question is, is it sustainable? None of us are making any money."

The seismic industry, he added, works in a "very capex-intensive industry, but we have no visibility. We need to reinvent the way we are doing exploration and find a way where we can have more [visibility]. If we could have five years of visibility, for example, we could then be more innovative with that time."

Another issue that several panellists flagged up was that of production model contracts, both in terms of their lack of change despite the sustained price downturn and also their time scales.

Eni's Bertelli commented, "We need more incentivised model contracts. We need to find contractual forms that enable the possibility for more investment in exploration." Statoil's Dodson added, "Essentially nothing has happened on these contracts. Nothing has been changed by governments. The way the costs are set up, the way profit is shared—it's the same as when the oil price was $100 per barrel. There are big reserves out there that will not be developed because there's not enough cake left for us. So it's a paradox that we have not seen more movement on this issue."

Shell's Powell also stressed that there is not currently enough time set into present contracts to do the upfront exploratory work required. Licence periods need to be longer, she said, adding however that the oil industry "has to ask itself if as an industry it has lobbied in the right way."

PROJECT UPDATES

Technip Dives in on Bahr Essalam 2

The *Deep Energy* pipelay vessel will be put to work on Bahr Essalam 2.

Technip has won the race for the contract to develop the **Bahr Essalam** phase 2 (*SEN, 32/15*) project in the Central Mediterranean Sea offshore Libya.

The natural gas field development, which is operated by Mellitah Oil & Gas, a consortium between National Oil Corp. and Eni North Africa, will be tied back to the **Sabratha** platform, which is situated about 110 km off the Libyan coast in a water depth of about 190 m.

The overall scope of work will see Technip carry out the overall design, detailed engineering and deliver the project management as well as procurement, installation, tie-ins, precommissioning and commissioning. This will be associated with the provision of a gas gathering system, which includes production pipelines, a subsea isolation valve and umbilicals as well as extensive diving and installation campaigns.

It also will include modifications to the Sabratha platform topsides. All offshore mobilisations will be undertaken from Malta.

Offshore installation is scheduled for second-half 2017 through to second-half 2018. A range of vessels from the group's fleet will be involved, including the *Deep Energy* pipelay vessel, the *Deep Arctic* diving support vessel and the *G1200* S-Lay vessel.

Phase 2 of the development will cover the delivery of gas output from two new wells from the C Central A area and 10 wells from the C East area to the Sabratha platform.

Gas and condensate production will be partially treated on the platform and then sent onshore to the Mellitah plant for final treatment. Current production from the Bahr Essalam Phase 1 project is running at 27.3 MMcm/d, while Phase 2 is expected to add production of 12.6 MMcm/d. Total cost of the overall project is put at $2 billion.

Development of the Eastern area covers 10 wells divided into two cluster manifolds, ECE and MCE, with five wells each.

These will be connected to existing risers and J-tubes on the Sabratha platform. ECE will be a 13.2-km tieback and MCE a 9.6-km tieback.

A new cluster in C Central Area A for two wells will be tied back 10.7 km to Sabratha, while a third well will be tied back 5 km to a dedicated preinstalled in-line tee.

Subsea facilities in this area include a pipeline end manifold collecting production from wells CC-16 and CC-17, subsea christmas trees for the wells, a subsea production control system, an 8-in. 10.7-km production line and a control umbilical.

Fourth Tree Installed on Catcher

Dril-Quip has successfully installed a fourth subsea tree on Premier Oil's **Catcher** (32/21) development in the U.K. Central North Sea in a water depth of 91 m.

The company has been manufacturing the subsea trees and controls for Premier Oil since it was awarded the contract in early 2014.

The scope of the order includes 18 subsea wellhead systems, 11 subsea production trees and seven subsea water injection trees. Also included are the controls equipment for the trees and manifold and topside mounted subsea equipment for installation on the Catcher Area FPSO unit.

Dril-Quip also has supplied the installation workover control systems and completion riser used to install the subsea production systems.

The first four trees consist of two production and two injection systems, and fill up a 2 by 2 slot template. The trees are shut in awaiting the installation of a manifold that has a Dril-Quip subsea controls module on it.

When the manifold is installed and the flowline hooked up to an FPSO unit, the first of the subsea wellhead systems will be placed online.

Meanwhile, fabrication of the FPSO hull and topsides is ongoing in Asia and the sail-away date of the FPSO unit from Singapore for a 2017 field startup currently remains on schedule.

The first major FPSO hull section was successfully delivered in December to the yard in Japan from South Korea. Topsides module and turret construction continue to progress well in Batam and Singapore. The FPSO contractor currently plans the commencement of hull and integration work in Singapore from mid-year 2016.

Leviathan Plans Approved

Noble Energy has won governmental approval for the development of the **Leviathan** (*32/18*) project offshore Israel.

The approved plan of development (POD) comprises a subsea system connecting production wells to a fixed platform located offshore with tie-in onshore in the northern part of Israel.

The fixed platform's initial capacity is anticipated to start at 33.9 MMcm/d of natural gas, which could rise to 59 MMcm/d.

J. Keith Elliott, senior vice president, Eastern Mediterranean, said, "Receiving support from the Government of Israel for the POD further builds upon recent regulatory momentum, including the Israeli government's approval of the revised stability language in the Natural Gas Regulatory Framework as well as the National Planning Committee's approval of the offshore location for the Leviathan platform and pipeline connection onshore.

"In addition, Noble Energy and partners have made quick progress marketing natural gas to new customers. Combined with a prior executed sales agreement, we have now contracted volumes from Leviathan to the Israel market in the amount of approximately 2.8 MMcm/d, with substantial volumes yet to contract in Israel and the region.

"Strong momentum on the regulatory and marketing fronts represents major steps in advancing the Leviathan project towards final investment decision."

Noble Energy operates Leviathan with a 39.66% stake. Other stakeholders are Delek Drilling (22.67%), Avner Oil Exploration (22.67%) and Ratio Oil Exploration (15%).

The Leviathan Field has an estimated 622 Bcm of recoverable natural gas resources.

PROJECT BRIEFS

Aker Solutions has won a $122 million contract from Petrobel to deliver its longest ever umbilicals system for the **Zohr** gas field in the Egyptian part of the Mediterranean Sea.

The deal covers delivery of 180 km of steel tube umbilicals that will connect the Zohr subsea development to an offshore control platform. The umbilicals system will be delivered by mid-April 2017. The work will be led by Aker Solutions' subsea division in Oslo, and manufacturing will start immediately at the umbilicals plant in Moss, Norway.

The company has invested substantially in the Moss facility over the past years. The plant has more than 20 years of experience in making the advanced and complex umbilical systems, which are used to transport data, power and liquids between oil and gas installations on the seafloor and facilities onshore or on platforms.

Petrobel, a joint venture between The Egyptian General Petroleum Corp. and Eni, is responsible for the development and operations at Zohr.

"Aker Solutions is building on its previous experience offshore Egypt to now deliver its largest-ever umbilicals.

Aker Solutions also has won a three-year $49 million contract extension from Total to provide maintenance and operations services at the **Elgin** (*32/21*) and **Franklin** fields in the U.K. North Sea. Elgin and Franklin is a HP/HT development in the U.K. North Sea's Central Graben. Elgin is located in blocks 22/30b, 22/30c and 29/5b. Franklin is located about 6 km southeast of Elgin in Block 29/5b. "We have a healthy order backlog and solid financial position underpinned by our continuous improvement efforts and consistently strong execution on major projects worldwide," CEO Araujo said.

Statoil has agreed to a deal to acquire JX Nippon's 45% stake in and operatorship of the U.K. licence for the **Utgard** (*SEN, 33/2*) Field. Statoil will increase its holding in U.K. licence P312 to 100%, having previously acquired stakes from First Oil in October 2015 and Talisman Sinopec in December 2015. Statoil is the operator in Norwegian Continental Shelf (NCS) licence PL046 with a 62% holding.

Utgard, previously known as **Alfa Sentral**, is a gas and condensate field spanning the U.K.-Norway median line. It is planned to be developed as a tieback to the Sleipner

(33/2) infrastructure on the NCS. Aker Solutions recently secured a contract from Statoil for preliminary engineering work to enable a tie-in of Utgard to Sleipner. Statoil might also exercise an option in the contract for engineering, procurement, construction, installation and commissioning services for the platform modifications. A final investment decision for Utgard is planned before year-end 2016 with production startup in 2020.

Aminex has begun commissioning the gas plant and subsea pipeline for its **Kiliwani North** development licence in Tanzania. Commissioning of the power generation system and other auxiliary facilities also has been completed. On June 2, the first Kiliwani North-1 gas was processed and entered the pipeline system connecting the Songo Songo plant with the national pipeline. Aminex said that during commissioning, gas rates are planned to increase to 849,505 cu. m/d, while pressuring up the plant and pipeline. Aminex said IP rates remain carefully managed to allow testing and commissioning of the gas processing plant and pipeline, while recording critical pressure and flow rate measurements to determine the optimal flow rate to maximise the life of the reservoir.

Thailand's Mermaid Maritime has picked up six subsea contracts in Asia worth about $15 million. The workscope includes subsea survey, inspection, repair and maintenance using saturation diving, air diving and the use of underwater ROVs. Two Mermaid subsidiaries will undertake the projects offshore South Korea and India as well as in various regions of Indonesia such as Natuna Sea, Bali North Sea, the Makassar Strait and the Java Sea. The duration of these projects ranged from 20 days to 90 days, with most of them scheduled for completion by November 2016.

GE Oil & Gas has picked up a contract from Statoil to supply and service wellhead and christmas tree equipment on its landmark **Johan Sverdrup** (*33/2*) project in the North Sea.

GE has won subsea work on the Johan Sverdrup development.

GE will manufacture, deliver and install its standardised surface wellhead and christmas tree systems at multiple wells that make up part of the field. The tree that GE will provide incorporates a special valve that increases the longevity of maintenance intervals, resulting in reduced downtime for the operator. GE said this will drive higher productivity and lower opex. Meanwhile, Rosenberg WorleyParsons has scooped a contract for the fabrication of three bridges and two flare towers for Sverdrup. Under the contract, which is valued close to $72 million, a bridge between the riser platform and the drilling platform and one flare tower will be delivered in 2018, with the remaining two bridges and one flare tower being delivered in 2019. The project has so far awarded contracts totalling close to $7.1 billion, with a Norwegian share of more than 70%.

The subsea pump control module was lifted onto the shell-operated **Draugen** (*33/1*) platform offshore Norway by the heavy-lift capacity vessel *Thialf* in May. The 220-mt control module will be connected to the first subsea mudline booster pump ever deployed by Shell. The subsea pump system is planned to be commissioned later in 2016. The field has been developed using a fixed concrete facility with an integrated deck. Deposits in the vicinity are produced by subsea wells tied back to Draugen.

The platform deck for the **Ivar Aasen** (*32/22*) project is now on its way to Norway after sailaway from the yard area in Singapore. The deck will be lifted in place on the field in July.

It is being shipped on the Cosco vessel *Xiang Rui Kou*. Det norske said it is on track to start production from the field on Dec. 1. The Ivar Aasen Field is located west of the **Johan Sverdrup** Field in the North Sea and contains about 204 MMboe, including the Hanz deposit. The economic life of the Ivar Aasen Field could be 20 years, depending on oil prices and production trends.

Joint integrity specialist Hydratight has completed an upgrade project on a section of subsea pipeline on the North West Shelf of Western Australia. Hydratight engineered, manufactured, delivered and supported the installation of an 18-in. connector on the John Brookes subsea pipeline located 54 km northeast of Quadrant's Varanus Island facilities. Bespoke features were included on the engineered product. These included corrosion-resistant alloy cladding, composite graphite seals, Hydratight's ball and taper technology and the company's subsea tensioning equipment.

Swiber Holdings has scooped three contracts worth $215 million in the Middle East and Southeast Asia. The firm clinched an engineering, procurement, construction and installation (EPCI) contract from a European oil major to perform pipeline replacement work in Qatar, marking its first offshore construction project in the Middle East. Work on the engineering phase for this project has commenced, with completion scheduled for completion in third-quarter 2017. Swiber also recently bagged two contracts for projects in Southeast Asia. In Myanmar, the firm is part of a consortium carrying out EPCI of two wellhead platforms, associated pipelines and tie-ins for a project offshore Myanmar for a major Southeast Asian oil and gas company. Work on the Myanmar contract, already underway, is planned for completion by first-quarter 2018, and the client holds the options to award an additional two wellhead platforms. The second Southeast Asian contract involves the provision of transport and installation services for a full field development project in the waters offshore Vietnam, with work targeted for completion in third-quarter 2016.

Eni has made a significant gas discovery in the **Baltim South West** exploration prospect offshore Egypt. The find in the Baltim South West 1X well is located 10 km north of the Nooros Field, discovered in July 2015. The Nooros Field is currently producing 65,000 boe/d and is expected to reach 120,000 boe/d by year-end 2016. The Baltim South West 1X well penetrated about 120 m of gross gas column and 62 m of net pay sandstones of Messinian age with excellent reservoir properties. Eni said it is already assessing the options for fast track development of the new find though existing infrastructure.

Independent Oil and Gas will spud an appraisal well on the U.K. North Sea **Skipper** discovery in July. The well in Block 9/21a will be drilled with Transocean's *Sedco 704* (*32/12*) semisubmersible unit. The primary objective is to retrieve good quality reservoir condition oil samples to optimise the Skipper Field development plan and to drill two mapped reservoir structures beneath the Skipper oil field in the Lower Dornoch and Maureen formations.

FLOATER NEWS

Stones Project Progresses

The *Turritella* FPSO unit will be the second in the GoM.

InterMoor has completed the final tensioning and chain-cutting operations on the *Turritella* FPSO vessel for Shell's **Stones** (*32/22*) project, located in the Walker Ridge area in the Gulf of Mexico (GoM).

The *Turritella* will connect to subsea infrastructure in about 2,896 m of water, breaking the existing water depth record for an oil and gas production facility.

The ultradeepwater project marks the first FPSO unit for Shell in the GoM, and the second FPSO unit in the GoM after **Cascade/Chinook** (*32/20*).

The *Turritella*, which arrived in January, is a disconnectable turret moored FPSO unit with nine mooring lines consisting of chain and polyester, arrayed in three bundles of three.

The mooring lines were attached to a disconnectable buoyant turret mooring (BTM) buoy at the field, awaiting the FPSO unit's arrival.

Each mooring leg has an in-line mooring connector (ILMC) tensioning system, located about 274 m below the surface, which was pretensioned after connection to the BTM. Once the *Turritella* arrived, the BTM was recovered by the FPSO unit.

InterMoor's workscope consisted of chain final tension adjustments through the ILMC system, subsequent cut and removal of excess chain, and riser pull-in rope stretching and transfer to the FPSO unit.

InterMoor used the Seacor *Keith Cowan* anchor-handling vessel to perform the first phase of the operations and later moved to a larger construction vessel already on charter and on standby.

FLOATER BRIEFS

Solstad Offshore has agreed to a deal with SBM Offshore for the tow out of the *Glen Lyon* (32/19) FPSO unit from Haugesund to its final location West of Shetland. The *Glen Lyon* is currently docked at Aibel's Haugesund yard in Norway where it is undergoing final preparations for deployment to BP's **Schiehallion** (*32/24*) Field in the U.K. North Sea. With a length of 270 m and a width of 52 m, *Glen Lyon* is the largest FPSO unit to dock at Aibel Haugesund. The vessel is expected to be in Haugesund for about two months. The workscope includes various marine operations and fabrication activities. Aibel also will assist BP with a function test of a mechanical winch.

Aqualis Offshore will provide position keeping services for the installation of the **Ichthys** (*32/23*) LNG project's FPSO unit. Aqualis will manage the position keeping procedure and provide position keeping masters during the offshore operations. The Ichthys FPSO unit, which will be 336 m long, will be permanently moored on a nondisconnectable turret for the life of the project, about 3.5 km from the field's central processing facility.

The Norwegian Petroleum Directorate has given Engie E&P Norge the green light to drill wildcat well 36/7-4 in production licence PL 636 off Norway. The well will be drilled about 10 km northwest of the **Gjøa** (*32/19*) Field. It will be drilled from the *Transocean Arctic* rig once it has completed drilling wildcat well 31/7-1 A for Faroe Petroleum in PL 740.

Mammoet said preparations have commenced for the integration of modules for the P-76 FPSO unit in Brazil. The company has mobilized one of its fleet of PTC 200-DS, a 5,000-ton capacity crane, from the U.S. to Brazil to carry out the work, which includes weighing, transporting and lifting of 20 modules ranging up to nearly 2,000 mt. All the modules are now located at the Unidade Offshore Techint integration yard in Brazil, awaiting the arrival of the FPSO hull, which is currently at the Enseada Inhauma shipyard in Rio de Janeiro. The PTC 200-DS ring crane was identified as the best option for the P-76 project due to it lifting capacity with a long reach, small footprint, manoeuvrability and quick mobilisation. Crane assembly already has started, with P-76 module integration expected to take place in second-half 2016.

EXPLORATION

Ireland Offers 14 Licences

The Irish government has offered 14 new licensing options offshore following the conclusion of the 2015 Atlantic Margin Licensing Round.

The options are the second phase of awards under the licensing round and follow on from the first phase of awards, which were made in February this year.

A total of 28 new options have now been awarded under the 2015 licensing round. The companies awarded options will carry out work programmes that will deepen understanding of the petroleum potential of Ireland's offshore.

Some 11 companies were offered acreage, including AzEire Petroleum, Capricorn Ireland, Europa Oil and Gas, Faroe Petroleum, Petrel Resources, Predator Oil and Gas, Providence Resources, Ratio Petroleum and Scotia Oil and Gas, all as operators, along with Theseus who will partner Predator, and Sosina Exploration who will partner Providence.

Seán Kyne T.D., Minister of State for Natural Resources, said, "The industry response to the 2015 round has been very positive, with a total of 43 applications for licensing options received by the deadline last September. The response to the 2015 Atlantic Margin Licensing Round is by far the largest number of applications received in any licensing round held in the Irish offshore. At a time of very low oil prices, the strong interest in the round is very positive.

"Industry's response to the round demonstrates the perceived positive prospectivity of Ireland's offshore and highlights confidence in the Irish regulatory process and the ability of industry to do business in Ireland."

Equatorial Guinea Launches New Bid Round

Equatorial Guinea's (EG) Ministry of Mines, Industry and Energy (MMIE) has launched the country's latest oil and gas blocks licensing round.

The EG Ronda 2016 makes available all acreage not currently operated or under direct negotiation. This comprises 37 blocks in total, 32 of them offshore. This includes Block A-12, newly relinquished by Marathon Oil, which has hosted multiple oil discoveries.

Also open is the former EG-05 block, which was once operated by Glencore. EG-05 was then split into four prospective offshore licenses, which have never been drilled.

A total of 114 discoveries have been made in the country to date, with 48 resulting in discoveries. The discovery success rate of 42% is double the global average.

EG is pushing ahead to develop energy infrastructure, including storage, petrochemicals and floating LNG, which will support and incentivise further E&P.

Minister of Mines, Industry and Energy H.E. Gabriel Mbaga Obiang Lima said, "Our nation is a proven profitable home for global oil and gas companies that explore our waters, and now we look forward to meeting potential explorers at roadshow events worldwide in 2016."

Deepwater Potential Brightening Up Black Sea

The *Noble Globetrotter II* is drilling the potential play-opening Polshkov-1 wildcat for operator Total in the Bulgarian sector of the Black Sea.

From Vienna (MT): A deepwater wildcat is underway in Bulgaria's Black Sea sector which could open up a whole new play, according to OMV's exploration chief.

The inland sea's deepwater oil and gas potential, in addition to its location and proven history of shallow-water shelf discoveries and production projects, makes it a true 'frontier' area, OMV's veep for global exploration told EAGE delegates at a session focused fully on the Black Sea region.

The 6th Generation DP3 drillship *Noble Globetrotter II* is currently drilling Bulgaria's first ever deepwater exploration wildcat targeting the **Polshkov-1** gas prospect. The potential significance of a further discovery, to follow up two previous deepwater gas finds made in recent years offshore Romania, was flagged up by Ingram, whose company is a partner in the Polshkov well being drilled in the Khan Asparuh block: "It's a potential play opener," he said.

Multi-well deep campaign

Operator Total, partnered by OMV and Repsol, spudded the Polshkov-1 well using the *Noble Globetrotter II* last month.

Located approximately 80 km offshore, the drillship is expected to drill several wells in this campaign over the next few months. Total and its partners signed the exploration contract for the license in August 2012, with the 14,220-sq. km block featuring water depths ranging from 100-2,000 meters. The probe is being drilled in around 200 meters of water. Seismic data acquisition was completed in early 2014. Total holds a 40% stake as operator with OMV and Repsol each with 30%.

Ingram reminded the audience of other previous deepwater successes in the western Black Sea offshore Romania, one of which is operated by an OMV Petrom-ExxonMobil joint venture. The first discovery, **Domino**, was made in early 2012 in the Neptun Deep block in a water depth of 900 meters. ExxonMobil was the operator for the well which targeted a Miocene gas target, with each company holding a 50% stake.

Ingram said: "We drilled seven wells between 2014 and 2016 using the *Ocean Endeavour* semisubmersible rig, and gas was encountered in most of those wells."

Estimates for Domino and the surrounding area are currently put at a cautious 1.5-3 Tcf of recoverable gas, with the companies now examining potential economic development options. He also highlighted the deepwater **Sile-1** well drilled by Shell and TPAO of Turkey in block 3920 in the Turkish sector last year, and which also used the *Noble Globetrotter II* drillship for the job. That probe was drilled 100 km offshore in 2,093 meters of water, and its results are still being evaluated.

Another speaker, Gabriel Ionescu of OMV Petrom, gave further detail on the emerging play trend, adding that a total of 10 deepwater wells have been drilled offshore Romania alone since the Domino discovery.

The other largest deepwater gas discovery there was made late last year by a Lukoil-led consortium, with the **Lira-1X** find in the Trident block some 170 km offshore in a water depth of around 700 meters. Lukoil has a 72%

share in the find, with its partners being PanAtlantic Petroleum (18%) and Societatea Nationale de Gaze Naturale Romgaz (10%). According to preliminary analysis the well hit a production interval 46 meters thick, and further appraisal drilling is planned.

Technical challenges

Jose Martin Banon of Repsol, who was moderating the session, highlighted the region's technical and operational challenges, stressing that advances in completion technologies, 4-D seismic, high-pressure drilling technologies, extended reach drilling and a deeper understanding of the Black Sea's pressure and fluid systems would play key roles in future discoveries and development projects in the basin.

But out of a total of 424 wells drilled in the Black Sea since the late 1940s, the success rate up to today is an impressive 26.6%, he told the audience. "That's from 399 wells drilled from the shelf, and only 25 wells drilled in more than 200 meters of water. From this there are 57 fields in total, 20 of which are producing. There is room for additional discoveries in the deep water, with more than 80% of the area not yet explored! And gas will be very likely," he concluded.

OMV's Ingram drew an analogy with what has happened so far in the Eastern Mediterranean, where the deepwater there was at a similar exploration stage with some large gas accumulations found offshore Israel and Egypt, he said. "We need to allocate resources to keep exploring the Black Sea. But it's an ongoing challenge in this environment."

TECHNOLOGY

GE Qualifies Wet Mate Connector

GE Oil & Gas said it has completed the qualification of its upgraded 36-kV high-voltage wet mate connector, MECON WM 36/500. The connector can be used with equipment such as transformers, switchgears, variable speed drives and motor loads.

GE uses the same patented technology for all its MECON wet mate connectors. A unique *in situ* flushing process enables the verification of a benign electrical environment. The flushing process is performed after the connector halves are brought together and before the electrical connections are completed.

Firstly, the connector is flushed with seawater to remove any contaminants, then by fresh water, alcohol and finally dielectric fluid. The dielectric fluid is analysed to verify a benign electrical environment before the electrical and mechanical connection is completed.

The process is enabled by a closed-loop flushing tool mounted on a conventional ROV and takes less than 20 minutes in total to complete, and no fluids are released to the environment.

MECONTM 36/500 has undergone more than a year of extensive testing to comply with the latest industrywide standards. The connector has been certified for operation up to 36 kV and 500 amperes in water depths down to 3,000 m.

"Our MECONTM Wet Mate 36/500 connector is designed to provide highly reliable connections of subsea high-voltage equipment. Unlike conventional stab-type connectors, we deploy a unique connection process that ensures that we are in full control of the electrical environment inside the connector before completing the electrical connection" said Alisdair McDonald, subsea power & processing leader at GE Oil & Gas.

TECHNOLOGY BRIEFS

Materia Inc., which manufactures catalysts and advanced polymers, has developed Proxima thermoset resins as its new solution for the oil and gas industry. Materia said Proxima resins provide solutions that could solve major technology challenges in subsea thermal insulation, subsea buoyancy and downhole tools. Earlier this year, Materia was selected by Shell to supply pipeline insulation materials for the **Appomattox** (*32/22*) development in the deepwater Gulf of Mexico. Brian Conley, senior Proxima product development manager, said, "Materia's subsea thermal insulation products offer full system integrity for high-temperature deepwater environments. The use of Proxima HTI polymers results in lower risk and better reliability for insulation of high-temperature subsea flowlines, field joints and equipment relative to the alternative engineered solutions."

BUSINESS

SeaEnergy Goes Into Administration

SeaEnergy, the Aberdeen-based energy services company borne out of Ramco Energy, has gone into administration.

KPMG were appointed administrators on June 2 at the request of the company's directors.

SeaEnergy is the holding company of the SeaEnergy group. The two principal trading companies are Return to Scene (R2S) and SE Innovation (SEIL).

R2S and SEIL provide visual asset management software (VAMS) services and packages to a variety of sectors.

R2S holds the intellectual property, which supports the VAMS (the key asset of the group).

SeaEnergy also owns 100% of the share capital in Eagle H C Ltd., which holds two U.K. royalty interests in respect of oil and gas exploration fields, and 100% of the share capital in SeaEnergy Hibernia Ltd., which holds 18.7% (about 30 m shares) of Lansdowne Oil & Gas. Trading in the shares of Lansdowne currently is suspended.

SeaEnergy began to experience cash flow challenges in late 2015, due to the ongoing oil price decline adversely impacting R2S activity levels. As seen throughout the industry, client orders were cancelled or postponed, and the number of new business enquiries reduced significantly.

Blair Nimmo, joint administrator and U.K. head of restructuring for KPMG, said, "We are pleased to have concluded the sale of R2S to James Fisher, which will safeguard the majority of jobs within the group, maintain customer service and provide the best outcome for SeaEnergy's creditors. Based on the information available at present, it is unlikely there will be any recovery for the shareholders."

North Sea Infrastructure Deals in the Pipeline

The North Sea will see a rise in infrastructure deals this year.

The North Sea will see a rise in infrastructure deals this year—particularly for subsea pipelines—with private-equity funds playing an increasing role in midstream assets, business advisory firm Deloitte said.

Against the backdrop of a low oil price, more oil and gas companies are looking to rationalise their portfolios and divest noncore assets in the U.K. Continental Shelf (UKCS), the firm said—with private-equity and specialist infrastructure funds likely purchasers.

Deloitte's latest European Infrastructure Investors survey found that pipelines, in particular, have provided a solid and steady return over the last five years. The asset class was highlighted by investors as performing well compared with other infrastructure, including fuel storage, ports and renewables; the internal rate of return on pipelines reached 14% from 2013 to 2016.

Deloitte's report also found that pipelines will remain a strong focus for infrastructure investors in the future, along with gas and fuel storage.

Shaun Reynolds, director, transaction services, at Deloitte, said, "Historically, big oil and gas operators developed and owned what they needed, transporting their major discoveries through proprietary pipelines and refining it in their own processing plants. That's largely remained the case, until the last two or three years.

"The ownership model has evolved, driven by the maturity of the basin and the low oil price. Established players are divesting to shore up their balance sheets, and infrastructure is comparatively less complex to value and sell, with a ready market at the right price."

Reynolds said private-equity firms and specialist energy infrastructure funds are likely buyers, specifically those with a solid grasp of the UKCS.

"They'll look to take a number of assets under management, create a portfolio, maximise their potential and then look to divest—most likely to a pension fund aiming for steady returns from a stable asset," he added.

In 2015, BP sold its stake in the Central Area Transmission System to Antin Infrastructure Partners in a £324 million (US$470 million) deal. Antin had bought BG Group out of its stake the previous year, giving it near-complete ownership of the asset.

The third-party ownership model has been employed successfully in the U.S. shale gas market for years, while oil and gas infrastructure in The Netherlands and Norway is commonly owned by private-equity or pension funds.

Subsea Sales Collapse

A snapshot survey by industry body Subsea UK has revealed that, while sales have dropped since the oil price collapse, the U.K.'s subsea industry is maintaining its investment in technology and looking to increase exports.

About 90% of respondents have seen sales decrease in the last 18 months. Of those, 28% saw sales drop by 30% to 40% and a further 28% have lost half their revenues with sales decreasing by 50% or more.

Almost 6% reported no impact on sales and almost 4% have seen an increase in revenues.

About 80% felt that the financial institutions have lost faith in the sector. However, only 5.7% were looking to refinance and 7.7% are actively seeking new investment.

Almost 70% of companies surveyed were not actively recruiting and 28% were recruiting less people than they were in 2015. More than 20% of respondents said that they were still employing apprentices to support their business; however, recruitment on the whole has dropped, with only 8% of companies reporting that they are looking to employ more people than they were 12 months ago.

Subsea UK CEO Neil Gordon said, "The decline in oil price and subsequent industrywide downturn has seen a massive reduction in capex and opex budgets worldwide, which have impacted on the subsea sector where we are seeing job losses and the collapse of companies, putting the U.K. sector's enviable world-leading position under threat.

"The findings from our survey underline the negative impact on revenues and recruitment, but they also reveal positive signs of the sector adjusting and adapting to the lower-for-longer oil price environment, which will ensure we are well-placed for the future."

The subsea sector's role in extending the life of the North Sea and maximising recovery of reserves is vital. But, with more than half of the revenues generated attributable to international sales, Gordon said that the sector's enduring success is based on its ability to maintain and grow its exports, which currently represent one-third of the global market share.

Some 80% of respondents hope to drive growth by increasing overseas sales and exploring new markets with a focus on the Asia, the Middle East, North America and Africa. Other countries of interest are Australia, China, Brazil and Norway.

Almost 80% of respondents are still investing in new technology and see this as an area of focus in the long term to secure future growth.

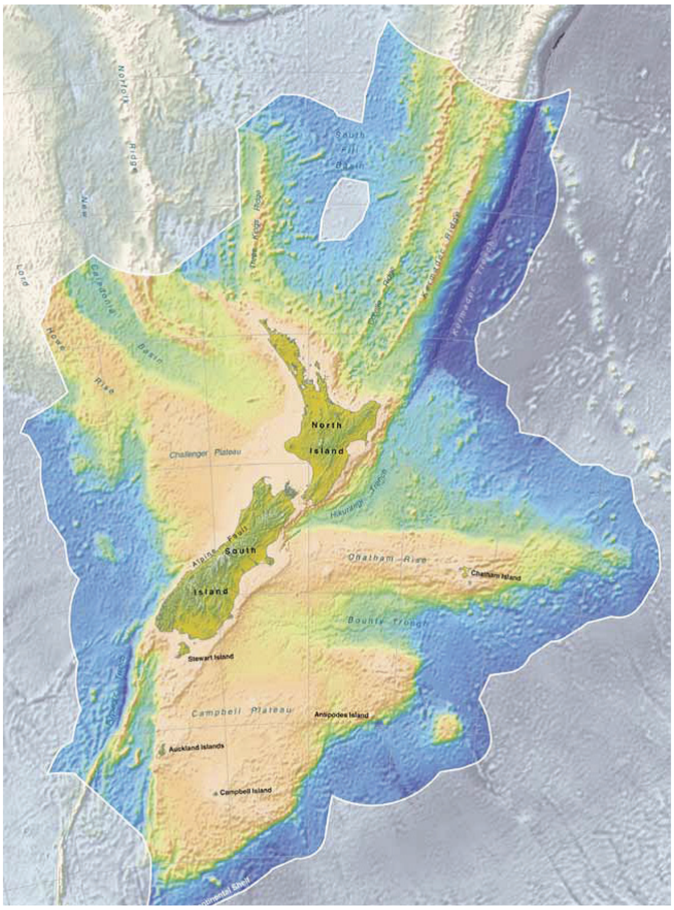
BUSINESS BRIEFS

HitecVision has completed the merger between its portfolio companies Core Energy, Spike Exploration and Pure E&P. The new company **Point Resources** is now operational. Point Resources is a new E&P company on the Norwegian Continental Shelf, with $300 million in new capital to fund growth through acquisitions and business developments over the next five years. The company starts life with a strong licence portfolio, including a production base of about 9,000 boe/d, significant holdings in several discoveries that are expected to be developed over the coming years, including **Pil** (45%), **Garantiana** (30%), and **Snilehorn** (17,5%), as well as an interesting exploration portfolio.

Petrobras' oil production from the Brazilian presalt layer broke a new record on May 8, surpassing 1 MMbbl/d, the company said. Presalt fields in the Campos and Santos Basins now account for 40% of oil production from facilities operated by Petrobras in Brazil. The new record was reached using just 52 production wells, an impressive return on investment per well.

Saipem has appointed Eni's head of planning and control **Giulio Bozzini** as chief financial and strategy officer, with responsibility for administration, finance and strategy.

Bozzini, who already has worked in a number of leading managerial roles at Saipem, will take over from Alberto Chiarini as CFO and manager responsible for the preparation of financial reports.



Promising areas such as the Taranaki Basin have piqued interest from companies such as TAG Oil. (Source: RISC)

TAG Oil is set to take over a 70% operating stake in petroleum exploration permit (PEP) 51153 in New Zealand's Taranaki Basin from Kea Petroleum Ltd.'s sale. MEO, which has a 30% interest in the PEP51153 joint venture, revealed previously that Kea's liquidators had entered into a conditional agreement for the sale of its interest in PEP51153 to an existing operator in the region. TAG already has a presence in New Zealand, with a 100% interest in the **Cheal** oil field located 7 km west of PEP51153.

AGR has announced a deal to work with the Norwegian development and production company, **OKEA**, to support the life cycle of its upstream assets on the Norwegian Continental Shelf. OKEA was launched in late 2015 with the sole focus of unlocking value in conventional oil and gas discoveries that have been found but not developed over the years.

Atlantic Petroleum has sold its 25% stake in the U.K. North Sea **Orlando** (*32/20*) development to Bridge Petroleum. The deal is contingent on Bridge Petroleum acquiring Iona U.K. When the transaction completes Atlantic Petroleum will not be participating in or funding the development of Orlando, and the only involvement for the company will be receiving its share of the sale proceeds when the field starts production. Orlando is being developed as a subsea tieback to the **Ninian** (32/20) platform. CEO Ben Arabo said, "The Orlando development is a good project, and we are very glad to see that there are plans for it to be taken forward to production in 2017. We don't expect any further write down on Orlando. If the field performs as expected and the oil price recovers, there can be significant upside to Atlantic Petroleum from the Orlando sales proceeds."

Based on the latest report from the Accident Investigation Board Norway, the **Norwegian Civil Aviation Authority** has decided to suspend all use of the H225 helicopter following the fatal crash in Norway. The model already has been suspended from regular traffic following the tragic accident at Turøy on April 29. The restriction applies from June 1 and entails that all use of this helicopter for search, rescue and medical assignments is suspended.

Wood Group Mustang and Mexican oil and gas operator and services company **Grupo Diavaz** have created a joint venture engineering business to capitalise on Mexico's energy reform. **Mustang Diavaz** is based in Mexico City and will provide engineering, procurement and construction management services to onshore and offshore facilities and pipelines for the upstream and midstream oil and gas markets in Mexico.

Global drilling and engineering contractor **KCA Deutag** has sold its *Ben Rinnes* jackup drilling unit to an integrated energy and services company for an undisclosed sum.

Built in Clydebank, Scotland, in 1973 and acquired by KCA Deutag in 2005, the *Ben Rinnes* was under contract offshore Angola until February. Since then, the ABS-classed Marathon Le Tourneau 53-S enhanced rig has been stacked in Gabon.

Norrie McKay, CEO of KCA Deutag, said the Ben Rinnes is the company's last asset in the mobile offshore drilling fleet.

McKay said that two Category J jackups will begin work on the Norwegian Continental Shelf in 2017.

BP Plc and **Det Norske Oljeselskap ASA** have agreed to merge their Norwegian businesses in a $1.3 billion all-share deal to cut costs, challenge Statoil's dominance of the local industry and look for more acquisitions.

The new venture, which could produce over a tenth of Norway's oil output, will offer BP an opportunity to tap into new oil production and reserves in the next decade after it cut back exploration in recent years.

Norway's seas, unlike Britain's, are offering more opportunities for exploration, with authorities opening up new acreage in the Arctic.

In particular, BP will gain exposure to the giant Johan Sverdrup Field, the largest oil find in Norway in 30 years, in which Det Norske has a 11.57% stake, and which is expected to start production in late 2019.

The merged entity, to be called Aker BP, will be part owned by Aker, an investment vehicle that is Det Norske's main shareholder and controlled by Norwegian billionaire Kjell-Inge Roekke. It will hold 40%, with BP taking 30% and the remaining 30% controlled by other shareholders.

The new company, which will include all of Det Norske's assets but only a small proportion of BP's, will also provide an opportunity to cut costs as oil companies worldwide battle with a 55% fall in the price of crude since June 2014.

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