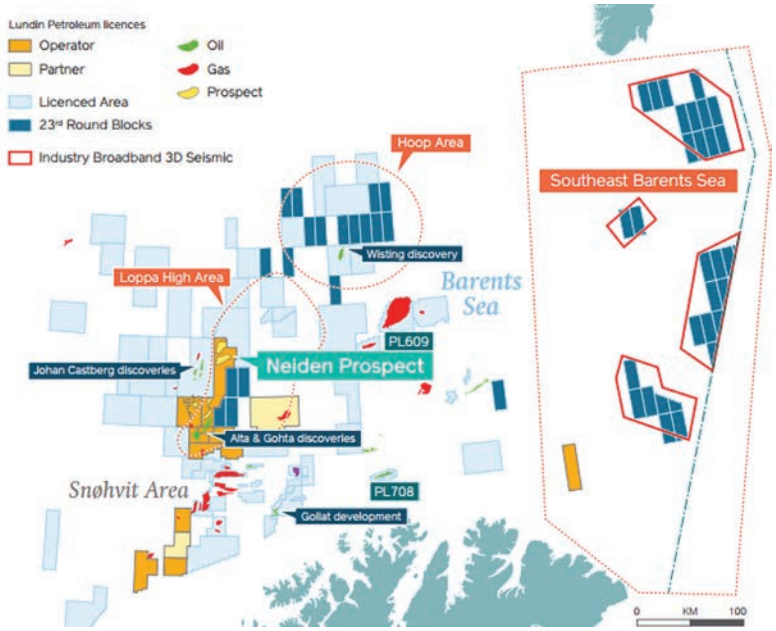
SEN
SUBSEA ENGINEERING NEWS

HARTENERGY

vol. 33 - no. 3 22 April 2016

Lundin Has Eyes on Barents Prize



Lundin Petroleum's licences in the Barents Sea.

Lundin Petroleum is ramping up its operations in the Barents Sea off Norway with plans taking shape for development of the **Alta** (*SEN, 33/1*) and **Gohta** discoveries, while an exploration and appraisal campaign will restart this summer.

The company has just asked Aker Solutions to carry out a study for an FPSO for the Alta and Gohta oil development, with a shipshape unit looking like the preferred option.

Gohta was discovered in 2013, while Lundin hit Alta a year later.

Lundin Norway's managing director Kristin Faerovik told *SEN* that lessons will be learned from ongoing projects in the Barents Sea. "I'm encouraged by what Statoil has done on **Johan Castberg** (*33/2*) and the work they have done there. They are working with engineers that we know well, and of course we have our own experience with Edvard Grieg," Faerovik said.

Statoil recently modified its plans for Castberg and is now looking to develop it with an FPSO unit and offloading by shuttle tanker rather than a pipeline to shore.

Faerovik added, "One of the biggest challenges in the Barents Sea is distance, so there is some additional cost in getting the barrels to market. Then we need to find a solution for the gas. That is where the **Goliat** (*33/1*) experience will help us. I'm sure we'll learn from the operational experience they are getting now."

On Lundin's **Edvard Grieg** (*32/22*) project, which was brought onstream on time and on budget, the engineering also was carried out by Aker Solutions. The living quarters and helicopter deck were delivered by Apply Leirvik, while the jacket was constructed at Kværner Verdal. The platform deck was built at Kværner Stord and Aker Solutions in Egersund.

Faerovik said, "Norwegian yards have always had a very good track record in terms of delivery. That has been their forte and that is going to be important in the future too, and of course the quality of the workmanship."

Focus on Loppa High

As studies get underway for the Alta and Gohta development, Lundin also will be continuing to focus on boosting the reserves base in the Loppa High area in the Southern Barents Sea.

Lundin estimates that there are 8.8 Bboe of yet-to-find resources in the Barents Sea, with 1 Bboe discovered over the past four years. There have been five recent oil discoveries and two gas finds.

WHAT'S INSIDE

Færøvik added, "The next big thing for us is in the Barents Sea. It holds the largest volume of yet-to-find resources in terms of any basin on the Norwegian Continental Shelf.

"We are going to further appraise Alta this summer and then we're going to go north to the Neiden prospect, which is not too far from Statoil's Johan Castberg development."

She said that following on from Alta and Neiden, Lundin will target the Filicudi prospect to the west of Alta. "That licence holds a string of prospects so we are very excited about Filicudi as well. Last but not least there are some humongous structures on offer in the 23rd round, and we have of course applied for some of that. Awards should be made before the summer."

The wells will be drilled with the *Island Innovator*, which is undergoing a full winterisation programme at the moment.

FLOATERS

Floating Production Sector Stays Stalled

The *Aoka Mizu* FPSO will be available for hire again.

There have been no floating production awards made in the past nine months, according to Energy Maritime Associates (EMA) second-quarter 2016 Floating Production Systems Report.

The last orders for production units were placed in July 2015: Shell's **Appomattox** (*SEN, 32/22*) semisubmersible unit, Golar's third speculative floating LNG unit (FLNG) and Golar's fourth speculative floating, storage regasification unit (FSRU).

Some 11 units have been delivered in the second quarter: five FPSO units, two tension-leg platforms, three oil floating storage and offloading units (FSOs), and one LNG FSO.

EMA said production of eight offshore fields has been or will be stopped in 2016. Four of these fields are being shut in earlier than expected and involve the *Armada Claire*, *Petrojarl Varg*, *OSX 3*, and *Aoka Mizu* FPSO units. Termination for two of these FPSO units is without compensation, which is rare. Bumi Armada is disputing Woodside's termination of the *Armada Claire*, which was being leased through 2018.

EMA also said that the backlog of orders is decreasing for the first time since 2013. The order book had been relatively stable at 62 to 65 units since fourth-quarter 2013, but dropped by 11% in first-quarter 2016. Declines are expected to continue as deliveries outpace orders. There are 18 deliveries scheduled by year-end 2016, but a few might be delayed.

"By 2017, we expect the backlog to drop below 40 units, a level last seen in the 2009 downturn," EMA added.

Some 35 units are now idle without contracts—24 FPSO units, seven production semisubmersible units, three FSOs and one mobile offshore production unit (MOPU). Many of these units will eventually be scrapped, while a few might be redeployed as early production systems or on short- to medium-term contracts on marginal fields.

EMA has identified 27 floating production units most likely to be removed from service over the next 12 to 20 months. These units are roughly split between leased and owned units with one-third of them operating in the North Sea. There are 14 units that have been in service more than 15 years and are likely to be scrapped. Plus, 12 of the units have been in service less than 10 years and many of these units will be laid up while seeking new contracts.

EMA said the sector will be in survival mode for 2016. It believes there will not be much activity this year, and what little activity there is will only occur towards the end of the year.

It has identified 28 projects with the highest chances of award by 2017. FPSO units account for more than half of the possible projects, with FLNG, FSRU, semisubmersible units, TLP, FSO and MOPU contracts also potentially to be awarded.

FLOATER BRIEFS

The *Glen Lyon* FPSO unit has docked at Aibel's Haugesund yard in Norway where it will undergo 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 vessel ever to dock at Aibel Haugesund. The vessel is expected to stay 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.

Premier Oil is targeting a sanction decision on its offshore Falklands **Sea Lion** (*SEN, 32/21*) FPSO development in mid-2017. Partner Rockhopper said that if this

is achieved it would result in a target first oil date during 2020. SBM Offshore is carrying out the FEED study for the FPSO, with work anticipated to take between 15 and 18 months to complete. The FEED contract for SURF transport and installation was entered into with Subsea7 for flexibles with National Oilwell Varco and for the subsea production system with One Subsea. An application also has been made to the Falkland Islands Government to extend the licence for the Sea Lion Discovery Area in PL032. Phase 1a of the development will utilise 18 wells to recover 220 MMbbl of oil during a 20-year period. Peak production at the field will be 85,000 bbl/d. Pierre Jungels, chairman of Rockhopper, said, "Going forward, we anticipate additional cost reduction opportunities being pursued during FEED to further enhance the economics of the Sea Lion project as we move towards a project sanction decision point in mid-2017. Premier Oil has confirmed its intention to seek an additional partner ahead of taking project sanction, and Rockhopper will support Premier Oil in this initiative."

The **Goliat** (*33/1*) Field was officially inaugurated by Norway's Minister of Petroleum and Energy, Tord Lien, on April 18. Goliat is the first oil field to come onstream in the Barents Sea. Production at Goliat started on March 12 and was followed by a production ramp-up of all wells. Full reinjection of associated gas into the reservoir has started, and reinjection of produced water to minimise environmental impact will begin soon. The platform has a production capacity of 100,000 bbl/d and storage capacity of 950 Mbbl.

DeepOcean has picked up a three-year contract, with options for two additional years, to provide a light construction vessel to Tullow Ghana. DeepOcean's DP2 ROV/construction vessel *Dina Star* began offshore activities in mid-March. The scope of work includes inspection, maintenance and repair, surveys and subsea construction on the Tullow Ghana operated deepwater **Jubilee** (*32/23*) and Tweneboa, Enyenra and Ntomme (**TEN**) (*33/1*) fields offshore Ghana. The vessel replaces the *Rem Forza,* which will now provide accommodation and construction support on the TEN project from March 2016.

Fugro has been awarded a contract by India's ONGC for the provision of ROV services on board the *Sagar Vijay* drillship. The contract involves providing support for deepwater drilling operations off the east coast of India in depths up to 900 m. The Fugro ROV will carry out seabed surveys, monitoring of subsea drilling operations, guideline cutting and reinstallation and remote intervention. Fugro also will provide drill support tooling during the 18-month project, which is expected to commence in May 2016.

GE Oil & Gas has kicked off production of four HP/HT dynamic flexible risers for Shell's **Prelude** (*33/1*) floating LNG project off the coast of Western Australia. GE has partnered with Shell on the project since 2011, following an initial order for turbomachinery equipment. The two companies have since collaborated on the subsea flexibles

GE will produce risers to be connected to the Prelude FLNG unit.

scope. GE will complete manufacture of the flexible risers at its facility in Newcastle, U.K., where it has invested more than $21 million to expand its production carousel capacity, enhancing manufacturing capabilities and equipping the site with the ability to accommodate larger diameter risers, which can be produced and delivered in optimum single lengths. The new carousel bays were officially opened in April 2014. Once manufactured, the flexible risers will be packaged onto purpose built large-diameter reels and transported more than 11,000 km between Newcastle and Southeast Asia in readiness for subsea installation.

Songa Offshore has received an acknowledgement of compliance from Norway's Petroleum Safety Authority for the *Songa Encourage* semisubmersible drilling rig.

Norwegian prime minister **Erna Solberg** has visited **Hyundai Heavy Industries** (HHI) in South Korea to boost ties between the offshore facilities contractor and Norway. The Norwegian delegation led by the prime minister also made a visit to HHI's offshore yard in Ulsan and met Norwegian supervisors working on the **Aasta Hansteen** (*33/1*) spar hull project, which is currently being built at the yard. HHI has won $10 billion worth of offshore facilities contracts from Norway including the world's largest cylindrical-type **Goliat** FPSO unit.

Jacobs Engineering Group will provide multidisciplinary engineering services for Woodside Energy's onshore and offshore assets for two years as part of an engineering panel, Jacobs said. Jacobs will deliver concept, FEED and detail design activities, engineering assessments and engineering support services for maintenance and operations.

Ezra, and EMAS Offshore Production Service have sold their combined 78.4% stake in the *Lewek EMAS* FPSO unit to a global infrastructure investment firm. The vessel is chartered to Premier Oil as operator of the **Chim Sao** (*31/9*) Field offshore southern Vietnam. Lionel Lee, group CEO and managing director of Ezra, said, "This transaction is fully in line with the group's strategy to move away from ownership of FPSO assets and will allow us to streamline our resources. Furthermore, it will allow us to move towards capitalising on the capabilities and experience we have harnessed from FPSO conversions and to build a franchise based on providing higher value-added services."

DEVELOPMENT

Exxon Turns the Taps on at Julia

Exxon Mobil has started oil production under budget and ahead of schedule at the **Julia** subsea (*SEN, 32/20*) oil field in the Gulf of Mexico (GoM). The first production well is now online and a second well will start production in the coming weeks.

The Julia development is located about 426 km southwest of New Orleans in water depths of more than 2,135 m. Julia is notable for the first high-integrity pressure protection systems in the GoM and its 16-km tieback to the Jack-St Malo semisubmersible unit in Walker Ridge 718.

Technology also has played a key role in the Julia development including the use of subsea pumps that have one of the deepest applications and highest design pressures in the industry to date.

The *Maersk Viking* drillship is currently drilling a third well, which is expected to come online in early 2017. Production results will assist in the evaluation of additional wells included in the initial development phase, which has a design capacity of 34,000 bbl/d of oil.

Discovered in 2007, the Julia Field comprises five leases in the ultradeepwater Walker Ridge area of the GoM. Exxon Mobil, the operator, and Statoil each hold a 50% interest in the Julia unit.

Exxon Mobil is on track to start up 10 new upstream projects in 2016 and 2017, adding 450,000 boe/d of working interest production capacity. The company says it is enhancing resource value through production optimization, technology application and cost management.

Premier Fires up Solan

Oil is stored in the Solan Field's subsea tank.

Premier has turned the taps on at its delayed **Solan** (*SEN, 32/21*) Field in the U.K. sector of the North Sea. The first producer well is being naturally flowed at a deliberately restricted initial rate. It is planned that the well will remain free flowing for a short time after which the electric submersible pump will be turned on.

Premier said that following this initial period and taking advantage of the availability of the *Superior Flotel*, over which Premier has contractual options until the end of May, Premier intends to carry out a planned production shutdown to complete the final commissioning of the water injection plant, the tie in of the second water injection well and preparation for the tie in of the second producer well.

The *Ocean Valiant* rig is currently drilling the second producer well, where 457 m of high-quality reservoir sands have been intersected and which is expected to be completed and tied in by mid-year. Production from the field is expected to build up to an anticipated production rate of 20 Mboe/d to 25 Mboe/d in the second half of 2016 when both pairs of producer-injector wells will be on stream.

The production facility has been developed as a not permanently manned installation and will be operated remotely from an onshore control room in Aberdeen. The topsides facility supports produced fluid separation, gas treatment, all necessary utilities and power generation.

The field infrastructure also includes a 10,000-mt subsea oil storage tank capable of storing 300 Mbbl. Produced oil is sent to the tank before being exported to shuttle tankers via a single-anchor loading system.

Hurricane to Spin Bit on Lancaster

Hurricane Energy has raised $62 million from private-equity fund manager Kerogen Capital to fund the drilling of two wells on the U.K. North Sea **Lancaster** (*32/19*) discovery in third-quarter 2016.

Hurricane plans to develop Lancaster initially with an early production system development consisting of two horizontal production wells (the 2014 horizontal well and the planned 2016 horizontal sidetrack well), tied back to a dedicated FPSO host facility.

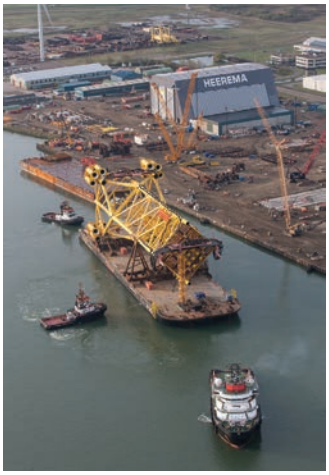
The sanction of the second phase of Lancaster's development is possible following a period of 24 to 36 months of continuous production from the early production system (EPS) phase of development.

Hurricane CEO Dr. Robert Trice said, "The pilot well is designed to determine our Lancaster contingent resource ranges ahead of any field development decision. The horizontal sidetrack is intended to establish flow rates that are at least similar to our 2014 horizontal well productivity as well as providing the remaining well stock for the EPS phase of development. The successful completion of these two operations will enable us to advance the development of one of the U.K.'s largest yet to be developed fields. To be able to progress to this point, while retaining a 100% interest in all our assets, is a tremendous accomplishment and can only aid our continuing farm-out discussions, which are progressing well."

DEVELOPMENT BRIEFS

Production from Serica Energy's **Erskine** (*SEN, 33/1*) Field in the U.K. North Sea is unlikely to restart until later this year to enable a foam cleaning pig to be recovered from the **Lomond** to **Everest** condensate line. A targeted mid-April restart has been pushed back due to wax deposits in the area of the blockage inhibiting pig recovery. Serica said progress is now being made but full line clearance might take several more weeks. Production restart is now expected to be deferred until after a planned two-month mid-year Lomond maintenance shutdown is completed.

Saipem has been awarded a new contract for the offshore section of the **Trans Adriatic Pipeline** (*32/18*) project—a joint venture between BP, SOCAR, Snam, Fluxys, Enagás and Axpo. The engineering, procurement, construction and installation contract involves the installation of a gas pipeline between the coastlines of Albania and Italy, across the Adriatic Sea. The work covers marine surveys, the installation of a 36-in. 105-km offshore gas pipeline, the supply and installation of an offshore fibre-optic cable, precommissioning activities and civil works at the landfalls in both Albania and Italy. The landfall in Italy is at San Foca in Puglia. Offshore installation works, which at their deepest point will reach 820 m below sea level, will be carried out using Saipem's semisubmersible pipelay vessel *Castoro Sei* and the trench/pipelay barge *Castoro 10*. Work will begin this year.



The Culzean jacket sails away from Heerema Vlissingen.

The wellhead jacket and the wellhead access deck are en route to the ultra-HP/HT **Culzean** (*33/2*) Field in the U.K. sector of the North Sea. Heerema Vlissingen constructed the jacket, while the wellhead access deck was built by Heerema Hartlepool. Heerema Marine Contractors will perform the installation. The overall Culzean development concept consists of a wellhead platform, a central processing facility platform and a separate utilities and living quarter platform with capacity for more than 100 people. The platforms will be linked by two 100-m bridges. First gas is currently expected in 2019. Meanwhile, Heerema

Zwijndrecht has completed construction of the topsides of the **Montrose** bridge-linked platform for Talisman Sinopec. The topsides will sail for the field in U.K. Block 22/17 in April.

Proserv has landed a multimillion-dollar contract with Statoil for the provision of production control equipment in Norway. Proserv will supply five wellhead hydraulic power units for Statoil's **Gullfaks** (*32/21*) oil and gas field in the Norwegian sector of the North Sea, which is undergoing an extensive topside upgrade programme. Work already has begun on the manufacturing of these systems and all five are expected to be delivered to Statoil by 2017.

The Huldra platform will be removed in 2019.

GE Oil & Gas and SapuraKencana Well Services have agreed on a tie-up to provide light well intervention services in the Asia-Pacific region. The alliance should enable oil and gas operators to bring wells into production, deliver life-of-field intervention services as well as to suspend and abandon these wells later in their life without the need for mobile drilling units.

"The generally prohibitive cost of performing interventions on subsea wells has meant that the volume of hydrocarbons extracted from offshore fields with subsea wells is typically far lower than offshore fields with platform wells," said Nick Dunn, global leader, Subsea Services & Offshore at GE Oil & Gas.

"By combining regionally based assets with local infrastructure and support, this strategic alliance will bring a cost-effective light well intervention solution to the market and create immediate value for the Asia-Pacific operator community. This alliance is an excellent example of the changing market trend where trusting relationships result in added value and cost savings for operators across the globe."

The memorandum of understanding signifies the formalization of the business relationship between the companies, which is already in operation with an initial focus on offshore Australia.

Eni is focused on starting production at its giant offshore **Zohr** (*33/2*) gas field in Egypt by year-end 2017, the company's CEO Claudio Descalzi said at an International Energy Agency event in Paris. Descalzi said Eni was moving fast on the project although there were some challenges. "We have already started the civil work. It is challenging, but we are focused," Descalzi said.

Hereema Marine Contractors has been awarded a contract by Statoil for the removal of the **Huldra** (*30/10*) platform in the Norwegian North Sea. AF Offshore Decom has been awarded the contract for disposal and recycling of the platform. The Huldra Field is a Statoil-operated gas and condensate field on the Norwegian Continental Shelf, northeast of Bergen. The field came onstream in November 2001 and on plateau the field produced 10.3 MMcm/d of gas.

Production from the field was shut down in 2014, and the *West Epsilon* will plug the field's six wells during 2016. The platform will be removed in 2019.

Sterling Resources has delayed a planned infill development drilling campaign on its U.K. North Sea **Breagh** (*32/21*) Field. The work from the **Breagh Alpha** platform has been put back until 2017. The anticipated campaign comprises two new wells, A09 and A10, as well as the reentry and hydraulic stimulation of one existing well to improve performance. Wells A11 and A12 and a further hydraulic stimulation of another existing well could follow on as part of the same drilling campaign. Early stage planning for a limited scope intervention on well A04 during 2016 also is ongoing to reinstate production from this well, which is currently shut in.

Voestalpine has won a major new contract for the **Nord Stream 2** pipeline project between Europe and Russia. After having supplied 170,000 mt of linepipe plates for the first part of the offshore gas pipeline in the Baltic Sea between 2008 and 2010, the group will now produce several hundred thousand tonnes for Nord Stream 2. Nord Stream is a 1,200-km offshore pipeline transporting natural gas from the Yuzhno-Russkoye natural gas field and neighbouring fields in Siberia via the Baltic Sea to Germany.

Statoil plans to start production at a new gas reservoir in the Barents Sea around 2020 to keep up LNG production from its **Snøhvit** (*33/2*) Field. The **Askeladd** reservoir will be tied into the Snøhvit Field gas installations, according to Margareth Oevrum, Statoil's executive vice president for technology, projects and drilling. The development currently produces gas from the Albatross and Snøhvit reservoirs. Statoil had initially estimated the third reservoir would launch production in 2014 or 2015.

EXPLORATION NOTES

Cairn is set to drill a fourth well—**SNE-4**, 5 km southeast of the **SNE-1** discovery well offshore Senegal—after having exploration and appraisal success with its latest evaluation programme. While targeting the Bellatrix exploration prospect and appraising the northern extent of the **SNE** (*33/1*) Field discovered in 2014, the BEL-1 well encountered two good quality gas-bearing sand reservoirs of a combined net thickness of 8 m between the Bellatrix main objective and deeper SNE appraisal objective, Cairn said in a news release. The exploration results confirmed the presence of shallower regionally extensive reservoirs also encountered in the SNE-3 well more than 9 km away. These well results, along with the latest 3-D seismic acquired in fourth-quarter 2015, will be incorporated into blockwide remapping to look at possible new plays and downdip oil potentially associated with the shallower reservoirs.

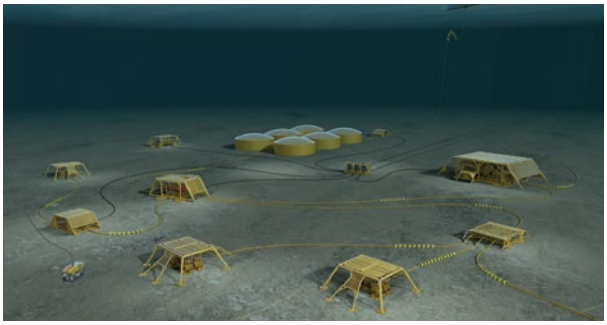
PGS said its latest GeoStreamer survey is providing high-resolution coverage of North Sea plays relevant for the 7th Danish Licensing Round. Initial data volumes will be available in May and August 2016. The Danish part of the North Sea is a mature area with a well-developed infrastructure and continued exploration potential. The prefunded multiclient acquisition extends dual-sensor coverage to 3,450 sq km in this sector. Coverage includes parts of the Danish Central Graben, Tail End Graben, Coffee Soil Fault and a section of the Ringkøbing-Fyn High.

Mexico's oil regulator voted on April 14 to improve the terms for its first deepwater auction in December. Commissioners of the regulator, the National Hydrocarbons Commission (CNH), voted unanimously to allow companies not involved in the day-to-day operations of a deepwater oil field to hold a larger stake than the project operator. The previous rule required that the operator hold the largest stake. The CNH is set to auction 10 potentially oil-rich deepwater blocks on Dec. 5. Four of the 10 blocks up for grabs straddle the maritime border with the U.S. in the Perdido Fold Belt. The remaining blocks are located in the Salina Basin along the southern rim of the Gulf of Mexico.

Statoil together with operator Repsol Sinopec and partner Petrobras has completed the **Gavea A1** well in the ultradeep presalt Block BM-C-33 in the Campos Basin in Brazil. The well encountered a hydrocarbon column of 175 m in a good-quality reservoir of silicified carbonates of the Macabu Formation. The well reached a total depth of 6,230 m and was successfully tested producing about 0.45 MMcm/d of gas and 4 Mbbl/d of oil. This is the fourth appraisal well in the licence, which comprises the **Seat**, **Gavea** and **Pão de Açucar** discoveries. In 2013 to 2015 the consortium drilled and tested the Seat-2, PdA-A1 and PdA-A2 appraisal wells. With Gavea A1 the consortium has finalised the appraisal activities in BM-C-33 and will now evaluate the subsurface data and assess development concepts.

TECHNOLOGY

NSRI Backs Subsea Storage



The NSRI is looking into subsea storage solutions.

The National Subsea Research Initiative (NSRI) is launching a drive to develop technology that will make underwater factories and storage more viable, helping to increase the recovery of hydrocarbons and prolong the life of the North Sea.

The industry-led, technology organisation recently hosted a workshop aimed at stimulating investment in and encouraging the development of emerging technologies, which will speed up the shift from costly surface platforms to subsea plants, will be more cost effective and enable recovery from smaller and harder to reach fields.

Gordon Drummond, project director of NSRI, said, "Subsea storage will play an important part in the future of the industry, when there will be less need for surface platforms and 'subsea factories' are likely to become a more common solution. This will allow us to recover resources from smaller oil and gas fields and access hard-to-reach fields.

"It is vital that we focus on the technologies that will offer safe, cost-effective methods to exploit the opportunities in smaller fields and tough sea conditions and move us towards a more complete subsea development solution."

Technology developers and the wider industry addressed the challenges in commercialising new subsea storage technology and looked at ways to progress concepts through to infield implementation.

Statoil Unveils New Subsea Concept Technology

Statoil has unveiled its new Cap-X subsea concept—designed to increase the efficiency of horizontal drilling in shallow reservoirs—at the Barents Sea Conference in Hammerfest.

Statoil said Cap-X is a combination of existing and new technology. It is a quarter the size of current subsea templates at 10 m by 10 m and enables more operations to be carried out from a vessel rather than a rig.

Cap-X is built around suction anchor technology with a steel suction anchor providing the foundation, with a glass fibre skirt and cap placed on top.

Statoil said, "This gives a solid, simple and cheap structure shaped to allow a trawler to easily pass over it."

The main structure of the technology can be produced in shorter time by a larger number of suppliers, with potential for local production, Statoil said.

The development of Cap X was initiated in 2013 to increase commerciality of potential resources in the Barents Sea.

"Once again we aim to drive subsea technology development on the Norwegian Continental Shelf together with our industry partners. The potential for increased efficiency and reduced costs can make this the next standard within subsea templates," Margareth Øvrum said.

"With Cap-X, Statoil is one step closer to a plug-and-play solution on the seabed."

Jez Averty, senior vice president for the exploration Norway and U.K. cluster in Statoil, said, "We as explorers need to find resources that can be developed at a lower cost and with lower emissions. Cap-X can potentially have a significant impact on developing the resources in the Barents Sea and in other areas with shallow reservoirs."

Viper Fault Finding System Trialled

Viper Subsea's new electrical fault finding technology system is undergoing a shallow-water trial at Portishead Quays Marina.

The system will help to identify the location of electrical faults on subsea installations and will enable field operators to better plan for repair or replacement of failed components, which could save the industry millions of pounds in halted production.

The system, known as V-IR, has been developed by Viper Subsea with the support of Total, BP, Shell and Chevron.

The shallow-water trial will run in phases and could last up to 12 months. The initial trial will take three months, during which time the V-IR technology suite will undergo communications and performance testing in a sea water environment that includes the use of 2 km of subsea cable, which has been deployed onto the bed of the marina.

Although a shallow-water trial, the main components already are designed for 3,000 m water depth. Following the shallow-water trial, there will be a period of further equipment qualification before the system is fully commercialised later in the year.

The trials are being carried out as part of a joint industry project (JIP) established through The Industry Technology Facilitator (ITF).

ITF CEO Dr. Patrick O'Brien said, "It is encouraging to see that one of our JIPs is nearing the latter stages of deployment with this trial. Identifying the exact location and why the failure occurred is time consuming and difficult with existing technology, meaning that the recovery and repairs of cables is risky and very expensive. Viper's V-IR system has the potential to provide substantial savings in time and costs to the industry."

Robotic Snakes for Subsea Inspection

Kongsberg Maritime and Statoil have signed an agreement with Eelume to speed up the introduction of snake robotic technology for subsea inspections.

Eelume, a spin-off company from the Norwegian University of Science and Technology (NTNU) will accelerate the new technology, which it said will significantly reduce costs related to subsea inspection, maintenance and repair operations.

NTNU and Sintef have conducted research on snake robotics for more than 10 years. Eelume is now developing a disruptive solution for underwater inspection and maintenance in the form of a swimming robot.

The idea is to let the robots carry out inspection and light intervention jobs on the seabed, reducing the use of large and expensive vessels.

With its snake-like form, the slender and flexible body of the Eelume robot provides access to confined areas that are difficult to access with existing technology.

Eelume robots will be permanently installed on the seabed and will perform planned and on-demand inspections and interventions.

The robots can be installed on both existing and new fields where typical jobs include visual inspection, cleaning, and adjusting valves and chokes. These jobs account

for a large part of the total subsea inspection and intervention spend.

"Eelume is a good example of how new technology and innovation contributes to cost reduction. Instead of using large and expensive vessels for small jobs, we now introduce a flexible robot acting as a self-going janitor on the seabed. To support smaller companies in bringing new technology to the market is an important part of our research portfolio," said Statoil's CTO Elisabeth Birkeland Kvalheim.

"This partnership offers the chance to bring radical technology to the market, not just in what the Eelume robot can do, but how it does it," said Bjørn Jalving, executive vice president Subsea Division at Kongsberg Maritime. "It is a new tool that will enable operators to realise large-scale cost savings by introducing new ways of conducting routine tasks and helping prevent unscheduled shutdowns by reacting instantly when required."

POLICY

U.S. Unveils Well Control Regulations

Stricter rules on BOPs will come into force.

The U.S. Department of Interior has unveiled a hefty package of well control regulations that require real-time monitoring for deepwater and HP/HT drilling, more controls on maintenance and repair of BOPs and third-party reviews, among other rules.

The 531-page final well control rules, which take effect 90 days after its publication in the Federal Register, were delivered about a year after the administration's proposal on well control regulations was first released and less than a week away from the April 20, 2010, anniversary of the deadly Macondo well blowout and Deepwater Horizon rig fire in the U.S. Gulf of Mexico.

Regulators have taken strides since the tragedy to strengthen, update and modernise energy regulations to ensure that oil and gas development offshore is carried out safely, Secretary Sally Jewell said during an April 14 conference call.

"We've made sweeping safety reforms, overhauling federal oversight by establishing independent regulatory agencies that have clear missions and are better resources to carry out their work while keeping pace with the rapidly evolving industry," Jewell said. "We've strengthened drilling and emergency response standards for oil and gas companies, and we're raising the bar through new standards for well design, production systems, blowout prevention and well control equipment. [The] industry, too, has stepped up to strengthen the culture of safety and cooperation."

Some of the rules already have been adopted by the industry, which created its own standards, improved operating procedures and devised better technology following the tragedy. The use of double shear rams in the BOP stack is one of the rules that is now a baseline industry standard.

The final rule, as stated by the Bureau of Safety and Environmental Enforcement (BSEE), includes:

- Minimum baseline requirements for the design, manufacture, repair and maintenance of BOPs;
- Additional controls over BOP maintenance and repair, including an annual mechanical integrity assessment report on certain BOPs by a BSEE-approved verification organization;
- A requirement that BOP systems have technology that allows drillpipe to be centered during shearing operations;
- More rigorous third-party certification of the shearing capability of BOPs;
- Real-time monitoring capability requirement for deepwater and HP/HT drilling activities, a practice that is already carried out by most deepwater operators. The rule helps ensure BSEE has access to the data;
- Criteria for testing and inspecting subsea well containment equipment; and
- Additional requirements for using ROVs to function certain components on the BOP stack.

Industry concerns remain

A day before the final rules were unveiled the American Petroleum Institute (API) reiterated its concerns and did so again following the release of the final rule. The API, which has devised 275 E&P standards that cover offshore operations including well design and BOPs, said the rule might have unintended negative consequences.

Among industry concerns were requirements for more accumulators to satisfy larger volumetric requirements, which would lead to larger and heavier BOP stacks than used today, and an "infeasible implementation timeline" considering several of the provisions require a BSEE-approved verification organisations to perform verification or certification service.

Randall Luthi, president of the National Ocean Industries Association, pointed out that some of their concerns were addressed.

"When regulations require retrofitting existing equipment or the use of new technology, it is best to have a reasonable implementation time. This was important to the industry, and on that aspect BSEE agreed and extended many of the proposed timelines," Luthi said. "However,

the final language on the prescriptive drilling margin may not completely address valid concerns expressed by some of our members. Therefore, the implementation scheme of that section will be key as regulators move forward under the rule. There may very well be more earwigs tucked away in the corn, but we are just now beginning to peel back the layers of this massive rule."

—*Contributed by Velda Addison, Hart Energy*

BUSINESS

Aker Goes Big in Brazil

Aker Solutions has formally opened its new subsea plant in Curitiba, Brazil. The plant will employ about 850 people and is dedicated to machining, welding, surface treatment, assembly and testing of christmas trees and other subsea equipment. It will provide the first subsea control systems manufacturing capability in Brazil. The plant, located in the city of São José dos Pinhais, will double the company's production capacity in the country. It is part of a global delivery model with subsea execution hubs in the Americas, Asia Pacific and Europe and will support customers both in and outside of Brazil. Aker Solutions also is upgrading its subsea services unit in Rio das Ostras.

The opening of the new plant comes after Aker Solutions secured a deal to provide maintenance and other services for subsea facilities at Petrobras-operated oil and gas fields offshore Brazil.

The three-year contract is worth $120 million and may be extended by another three years. It covers maintenance, storage, supply of parts and technical assistance for all subsea equipment delivered by Aker Solutions to Petrobras in Brazil.

Aker Solutions is set to open a new subsea manufacturing centre in April in Curitiba, doubling its local production capacity. The company also is upgrading its subsea services unit in Rio das Ostras to better meet customer demand.

The agreement is similar to one signed in 2011 for maintenance of equipment and other offshore services. Currently, Aker Solutions' subsea life-cycle services unit has about 360 employees in Brazil, of which 150 are part of the technical team working offshore. The company has about 1,300 employees in the country.

Aker Solutions has since 1997 delivered more than two-thirds of 290 subsea trees ordered for Petrobras-operated offshore oil and gas fields in Brazil. About 200 of these have been installed.

"The facility will build on and strengthen our nearly four-decade presence in Brazil, which is a key global offshore market with significant deepwater and subsea potential," Aker Solutions' CEO Luis Araujo said. "It reinforces our commitment to developing local competence and working with our customers to create long-term value in this major oil and gas province."

BUSINESS BRIEFS

DOF Subsea said it has recently picked up several inspection, maintenance and repair (IMR) and subsea installation contracts worth about $61 million. In the Asia-Pacific region DOF Subsea has been awarded a letter of intent from a key client for an engineering, procurement, construction and installation project with the offshore phase during first-half 2017. The scope of work includes supply chain management services for the fabrication and supply of mooring chains and the replacement of eight mooring legs. In the Atlantic region, DOF Subsea has been awarded an FPSO mooring installation and hookup contract by Yinson Production offshore Ghana, on the Eni-operated **OCTP** (*33/2*) Field. The contract will secure utilisation of Atlantic region subsea vessels in fourth-quarter 2016 and first-quarter 2017, and the project will increase DOF Subsea's presence in West Africa. DOF also has been awarded a five-year pipeline inspection frame agreement for Maersk. In the North America region, DOF Subsea has been awarded several contracts with key clients in the Gulf of Mexico and offshore Canada. The scope of work includes survey, IMR and light construction. To service the contracts offshore Canada, DOF Subsea will charter the DOF-vessel *Skandi Chieftain* for a 100-day job, in addition to increasing the number of ROV systems deployed in the region.

Wood Group PSN has been awarded a five-year $150 million contract from **Nexen** to continue to deliver operations, maintenance and technical support across Nexen's North Sea offshore assets: the **Buzzard** (*32/20*), **Scott** (*32/23*) and **Golden Eagle** (*32/10*) platforms. More than 190 jobs are retained under the contract, which is effective immediately and builds on Wood Group's 12-year relationship with Nexen in the U.K. Continental Shelf.

Aqualis Offshore and **China Ship Design & Research Centre** (CSDC) have signed an agreement to cooperate on engineering projects both in China and internationally. Aqualis Offshore and CSDC aim to provide a joint engineering service to all offshore projects, including jack-ups, tension-leg platforms, spars, semisubmersible units and FPSO units. They also will provide FEED services, including conceptual design, basic design and national research projects, plus detailed design engineering service for transportation and offshore installation of fixed platforms, floating structures and subsea facilities.

Cox Oil has acquired 19 fields and associated assets located primarily on the Gulf of Mexico's Outer Continental Shelf and in Louisiana state waters from Chevron.

The asset acquisition package includes 170 active wells, 70 platforms, 70 caissons and other offshore structures.

James Fisher Offshore (JFO) has relocated its Asia-Pacific facilities to Johor Bahru in Malaysia. JFO's Managing Director Jack Davidson said, "During the next five years, this region is expected to become a major oil and gas market due to its significant growth, and this relocation means we are brilliantly placed to deliver specialist subsea and topside services to support key customers. Our ambitious regional growth strategy very much underpins our focus on continuing to provide reliable integrated solutions to the energy industry."

NLI Subsea has appointed Øyvind **Frydenberg** as the company's new CEO. Frydenberg has been CEO of Dresser-Rand, CEO of FMC Kongsberg Metering and also has held several leadership positions in FMC. NLI Subsea consists of six companies delivering engineering, products and fabrication services to the subsea market.

Electromagnetic Geoservices (EMGS) is axing 15% of its staff as it bids to cut costs during the industry downturn. The company said it will also centralise and/or merge departments. "Whilst the interest in our technology continues to be high, our customers are delaying, cancelling or reducing work scopes, resulting in a lower demand for our services. Therefore, we continue to focus on cost control and cash flow, and implement changes to increase the efficiency of the organisation," said Christiaan Vermeijden, CEO of EMGS.

Det norske oljeselskap is expanding its portfolio offshore Norway with a deal to acquire **Centrica's** stakes in the **Frigg Gamma Delta** (*32/15*) and **Rind** (*30/23*) discoveries. The portfolio consists of 30% stakes in licences PL 442, PL 026B and PL 026, including the operatorship of Frigg Gamma Delta.

Bob MacDonald, CEO of **Wood Group Kenny**, has been elected to the council of the Society of Underwater Technology (SUT). As part of the council, Bob will help steer the direction of the SUT to support the future success of the global subsea industry and promote understanding of the underwater environment. As a member of the organisation for 15 years, Bob also recently celebrated his first anniversary as an SUT fellow.

The next issue of SEN will be published on May 13.

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Subsea Engineering News (ISSN 0266-2205) is published twice monthly by Hart Energy Publishing LLP, Houston TX, USA. Telephone (UK): +44 (0)1403 782198; Telephone (US): +1 713 260 6400; Email: **sen@hartenergy.com** or **custserv@hartenergy.com**; Website: **www.epmag.com/subsea-engineering**. Email for subscriptions: **mpigozzi@hartenergy.com**.

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