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Getting Lean And Mean In Malaysia

In the low oil price environment of the past three years, oil and gas companies have curbed spending and looked to where they could get more out of what they already have.

A project in Malaysia has been ahead of the curve, albeit not without its challenges. In 2013, with declining production rates and a growing fleet of so-called idle wells, Malaysia Petroleum Management (MPM), the part of state-owned oil firm Petronas that regulates upstream petroleum activities in Malaysia, decided to take charge.

Well intervention operations take place offshore Malaysia. (Source: Malaysia Petroleum Management (MPM)/Petronas)

The trigger was a realization that some 50% of the country's well inventory was idle, resulting in a locked-in potential of some 80,000 bbl/d of oil, said Shahril Mokhtar, head of completions at MPM, which is also a partner on some 100 production-sharing contracts (PSCs) in the country.

A goal was to arrest Malaysia's production decline rate, and one of the key activities was a nationwide idle wells management strategy. It was initially a success, with additional production from well intervention activity increasing from 14,000 boe/d to 24,000 boe/d between 2013 and 2014. However, this was done at a very high price.

Also, when the oil price dropped, so did activity. Malaysia had up to 28 rigs operating prior to mid-2014. By the end of 2015, it dropped to just six, Mokhtar said.

Operations spending was also cut, and in 2015 production gain from well intervention operations fell from the 24,000 boe/d achieved in 2014 to 16,000 boe/d.

But there was a deeper problem. Even when spending on well intervention had increased, success rates had only been 65%. "Spending US$100 million and getting only a 65% success rate is not a good way to run business," Mokhtar said, speaking at OWI EU 2018, a European well intervention conference that took place in Aberdeen earlier this year. The problems were usually due to job failure, inefficiency, value leakage, and subsurface failures, he said.

Back To The Drawing Board

As a result, a decision was made to re-assess the idle wells strategy in 2015.

"MPM had to come up with a strategy to sustain the level of activity for well intervention and improve efficiency," Mokhtar said. "We came up with a new strategy, called Integrated Idle Wells Restoration (IIWR), with a goal to improve the success rate to at least 85% (was 65%); increase additional production from well intervention from 14,000 boe/d to 22,000 boe/d, while keeping costs down; and improve operational efficiency to 85%. Half of the latter (operational efficiency) is vessel utilization-re-

WHAT'S INSIDE

lated, i.e., the vessel is at dock, on standby or waiting on weather, etc."

The work tied in to another program, the nationwide Cost Reduction Alliance (CORAL 2.0) program, which set out to reduce overall upstream industry spending in Malaysia. Under the CORAL program, the Lean Well Intervention initiative was launched with a goal to reduce overall well intervention spending in Malaysia by 3% by 2016 and 10% by 2020.

What happened was perhaps a surprise. "The whole sector worked together and saved US$92 million (25%) within a year," Mokhtar said. "It made us realize that all this time we were really not very efficient in well intervention."

So where were the savings made? The biggest proportion of the cost saving (74%) came from using the right operating model (i.e., using the right conveyance method, such as coiled tubing (CT) or wireline) and selecting the right equipment for the job, Mokhtar said. Standardizing equipment, removing standby costs, being fit-for-purpose and only mobilizing what was needed accounted for 14% of the savings, while contract management—negotiating better rates, aligning contracts to budgets available, etc.—made up 12% of the savings.

A large part of the success was based on using an integrated model, promoting collaboration and risk sharing. "The integrated model was something we hadn't done before," Mokhtar said.

Going To Work

The first major IIWR project was a nine-month continuous well intervention project with EnQuest. The objective of the project was achieved with 94% time working on well, with just 4% nonproductive time and 2% waiting on weather. "Those are the types of efficiencies we want to see," Mokhtar said. "Previously, it was 60% (time working on well)."

In another project last year, an 11-well startup campaign, from two platforms, two vessels were deployed under an integrated project.

"It wasn't in the tender, but the proposal came in for two vessels to work concurrently and to do the work within 50 days using walk-to-work capability," Mokhtar said. "This kind of setup has never been seen in Malaysia before."

Mokhtar highlighted that these are integrated projects, and not just bundling services. To work, this approach needs risk sharing. Historically, 50% of a project cost was marine-related, because if the slickline was down or CT stuck for two weeks the vessel would still have to be paid for. Now, in an integrated project, if a tool is down, everything is down, Mokhtar said. "It's a single-package rate (solution-based), if you have one or two vessels, etc.

"You cannot expect to get the same result from doing the same things. We have changed how we work and the results show that it is working," he continued.

Results

Since the IIWR project started in 2016, the well intervention success rate has improved from 65% to 86%, operational efficiency has improved from 60% to 94% and a production gain factor of 10 has been achieved, Mokhtar said.

In IIWR year one, only one project was completed (with EnQuest), but activity has been building. In 2017 operators EnQuest, Hess and Shell ran three campaigns using two packages. This year eight companies are running 13 campaigns with 13 packages being mobilized, Mokhtar said.

Furthermore, Shell completed the first subsea decommissioning work in Malaysia this year. The country also will see its first subsea stimulation campaign from a vessel this August with Murphy Oil Co.

However, MPM isn't resting on its laurels. It is keen to see techniques that were dropped when the oil price fell, such as plugging and abandonment for sidetrack/infill well drilling, and hydraulic workover units come back in to use.

Mokhtar said other technologies that haven't been used for some time are coming back, such as fiber-optic CT; perforation, cement and wash; downhole cameras; and CT catenary (last used in 2014 and due to be used again in May this year). Work also is starting into full decommissioning of fields under IIWR.

With success, there is also risk. "One concern now, as activity ramps up, is health, safety and the environment," Mokhtar said.

You can be sure it will be on MPM's target list.

—Elaine Maslin

DEVELOPMENT BRIEFS

Chiyoda, Synergy Score Abadi LNG Deal From Inpex

Chiyoda Corp. and PT Synergy Engineering have been awarded a pre-FEED contract by an affiliate of Inpex Corp., the companies said June 18.

The contract is for the subsea umbilicals, risers and flowlines (SURF) and gas export pipeline (GEP) facilities of the Abadi LNG project in Indonesia.

Inpex Masela Ltd. is undertaking pre-FEED studies for the Abadi Field development in the Masela Block located in the Arafura Sea with an onshore concept, under the supervision of the Indonesia Government Special Task Force for Upstream Oil and Gas Business Activities.

Under the terms of the contract, Chiyoda and Synergy will jointly utilize their resources to provide Inpex with various engineering, safety and cost studies as well as development of the future FEED scope of work, as a pre-FEED package for the SURF and GEP facilities

Xodus Group Ltd. and Subsea 7 SA will deploy their specialized capability for specific studies as nominated

subcontractors. Xodus, in which Chiyoda and Subsea 7 hold 40% and 60% shares respectively, will provide technical leadership and supply studies based on its deepwater SURF and pipeline design expertise. Subsea 7 will contribute specific studies and advice especially focused on competitive installation solutions.

ConocoPhillips Doles Out FEED Awards For Barossa

ConocoPhillips Australia has awarded three major engineering contracts for the FEED phase of the Barossa offshore project, the company said in a news release.

Gas from the field is the proposed new source of gas for the Darwin LNG facility.

Development of the offshore gas and light condensate field consists of an FPSO, subsea production system and gas export pipeline.

Separate FPSO FEED contracts were awarded to MODEC and a consortium that comprises TechnipFMC and Samsung Heavy Industries. INTECSEA landed the FEED contract for the subsea umbilicals, flowlines and risers as well as the gas export pipeline.

A final investment decision on Barossa is targeted toward year-end 2019, partner Santos said.

ConocoPhillips Australia Barossa Pty Ltd. is the operator of the Barossa joint venture with a 37.5% interest with partners SK E&S Australia Pty Ltd. (37.5%) and Santos Offshore Pty Ltd. (25%).

Danos Wins Contract For Shell's Appomattox Platform In GoM

Danos said June 14 that Shell Exploration and Production Co., a subsidiary of Royal Dutch Shell, has awarded a contract to Danos to provide coatings for Shell's deepwater Appomattox platform in the U.S. Gulf of Mexico (GoM). The coatings project is expected to last about six months.

This is not Danos' first experience with the Appomattox project. Danos fabricated three boarding valve skids and one service line skid out of its Amelia facility for Appomattox, which required support from the company's project management, fabrication, coatings and automation service lines.

Located in the GoM about 128 km (80 miles) off the coast of Louisiana, the Appomattox platform is one of Shell's new deepwater investments in the GoM and is set to begin production before the end of the decade.

Subsea 7 Wins Contract Offshore Gulf Of Mexico

Subsea 7 has been awarded a sizeable contract by Shell as part of the deepwater Vito development in the U.S. Gulf of Mexico.

The contract scope covers the project management, engineering, procurement, installation and pull-in of two 12-in. infield production flowlines with 10-in. steel catenary risers (SCRs), one gas-lift flowline and SCR, and the umbilical system.

Project management and engineering will take place in Houston with support from Subsea 7's specialist technical pipeline group in Glasgow, U.K. Offshore installation activities are scheduled for 2020 and 2021.

Kongsberg Secures Johan Sverdrup Phase 2 Work From Equinor

Equinor has contracted Kongsberg Maritime to deliver the safety and automation systems for Phase 2 of the Johan Sverdrup development in the Norwegian North Sea, the company said June 14.

Phase 2 will add a fifth platform to the Johan Sverdrup development. (Source: Equinor)

Kongsberg Maritime's selection for Johan Sverdrup Phase 2 confirms its existing position as a key technology partner for the project since 2014, when Equinor Energy AS (formerly Statoil) awarded a project specific agreement including FEED for delivery of safety and automation systems to the four Phase 1 field platforms.

The Phase 2 agreement includes delivery of safety and automation systems and digital technology for a new processing platform, which is due to start production in 2022. Kongsberg Maritime will also extend and modify already delivered systems for the field center, in addition to providing three subsea production system tiebacks and technology solutions for shore power at Haugsneset, near Haugesund.

The core scope of supply for Johan Sverdrup Phase 2 features safety and automation systems technology including process control, subsea control unit, power distribution control, process shutdown, emergency shutdown, fire and gas systems, life-cycle simulator, information management system and OPC-UA data gateway. The latest generations of Kongsberg Maritime safety and automation systems technology for production, integration, presentation, simulation, training and operation also are included.

Subsea 7 Wins Contract Offshore Egypt

Subsea 7 has been awarded an engineering, procurement, installation and commissioning contract by Burullus Gas Co. for the West Delta Deep Marine Phase 9b development project offshore Egypt.

The scope includes connecting six new wells into existing subsea facilities using umbilicals and flexible flowlines. Project management and engineering work already has commenced at Subsea 7's office in Cairo and Paris. Fabrication of the subsea structures and spools will be carried out at Petrojet's yard near Alexandria, Egypt.

Offshore work is scheduled to begin in second-half 2019.

Exxon Mobil Commences Drilling Offshore Guyana Projects

Exxon Mobil Corp. has started development drilling in three offshore Guyana projects, which could produce more than 500,000 bbl/d of oil. The company expects to start producing oil from these developments in 2020.

In March Exxon Mobil said projects in Guyana and the Permian Basin region of Texas and New Mexico, as well as refining and chemical plant expansions, should drive earnings gains.

An oil tanker converted into an FPSO, *Liza Destiny*, will anchor Exxon Mobil's Liza Phase 1 development offshore Guyana that will engage four undersea drill centers with 17 production wells.

Exxon Mobil said that Phase 1 is progressing rapidly, with the start of development drilling.

Construction of *Liza Destiny* and other subsea equipment is underway in more than a dozen countries. The FPSO will sport a production capacity of about 120,000 bbl/d and will ultimately join with two other FPSOs later in the project development to produce more than 500,000 bbl/d.

Exxon Mobil and its partners have so far discovered estimated recoverable resources of more than 3.2 Bboe on the Stabroek Block.

"We are well on our way to producing oil less than five years after our first discovery, which is well ahead of the industry average for similar projects," said Liam Mallon, president of ExxonMobil Development Co. The Liza development and future projects will provide significant economic benefits to Guyana."

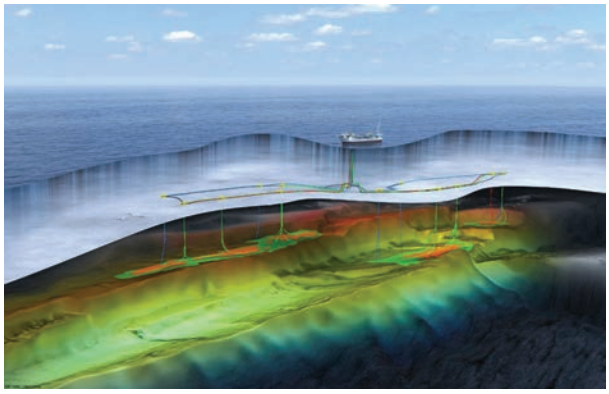
The company anticipates more than $7 billion in royalty and profit oil revenues for Guyana over the life of the project.

Norway's Parliament Approves Equinor's Johan Castberg Plan

Equinor's plan for the development and operation of the $6.1 billion Johan Castberg Field in the Barents Sea was approved by the Norwegian Parliament on June 11.

Development of the field, the largest subsea field under development, consists of a production vessel and a comprehensive subsea system, including 30 wells distributed on 10 templates and two satellite structures. First oil is scheduled for 2022, and the field has a production horizon of 30 years.

"The project is on schedule and, gradually, we will see the results of the construction work. Many yards and



CAPTION: Developers of the Johan Castberg Field aim to start production in 2022. (Source: Equinor)

companies across the country will be busy with Johan Castberg deliveries in the years to come," said Knut Gjertsen, project director for Johan Castberg.

Costs for the project have been cut in half, dropping from more than $12.5 billion, as the breakeven oil price also has fallen from more than $80/bbl to less than $35/bbl.

"The project has worked hard together with suppliers and partners; they have changed the concept and found new solutions for realizing the development," Equinor said.

The Johan Castberg Field will have a supply and helicopter base in Hammerfest and an operations' organization in Harstad. The costs of operating the field are estimated at some $143 million per year.

Equinor and other operators with oil deposits in the Barents Sea are looking at the possibilities of oil transfer at Veidnes in Finnmark County, including a downscaled terminal solution and ship-to-ship transfer, the company said.

The Johan Castberg partnership consists of Equinor (operator, 50%), Eni Norge (30%) and Petoro (20%).

Shell Taps Subsea 7 For Penguins Redevelopment Project

Subsea 7 SA has been awarded a contract by Shell for the Penguins Redevelopment Project about 241.4 km (150 miles) northeast of the Shetland Islands, the company said.

The engineering, procurement, construction and installation contract incorporates the fabrication of two Pipeline Bundles containing pipe-in-pipe production flowlines, gas-lift flowlines and control systems. Additionally, this award includes the fabrication of a 9-km (5.5-mile) 16-in. gas export pipeline, flexible riser system, dynamic umbilical riser system and associated subsea tie-ins.

Project management and engineering work will commence immediately in Aberdeen, with support from Subsea 7's specialist technical pipeline group in Glasgow.

Offshore activities are scheduled for 2020 and 2021.

Corinth Pipeworks Lands Job For Energean's Karish Field

Cenergy Holdings subsidiary Corinth Pipeworks Pipe Industry will manufacture and supply the steel pipes for Energean's Karish gas field development in the Eastern Mediterranean.

The agreement, which was signed with TechnipFMC in early June, covers 90 km (56 miles) of 24-in. and 30-in. longitudinal submerged arc-welded pipe material for the offshore gas pipeline, which connects the subsea manifold at a maximum water depth of 1,750 m (5,741 ft) to the receiving terminal onshore, Corinth said in a press release.

Pipe manufacturing and coating will begin at Corinth Pipeworks facility in Greece later this year.

NPD Green Lights ConocoPhillips' Installation Ekofisk Project

The Norwegian Petroleum Directorate (NPD) has granted ConocoPhillips permission to start its Ekofisk 2/4VC development in the North Sea.

The development, which was approved by Norway's Ministry of Petroleum and Energy in September 2017, comprises a subsea template with four well slots and four wells for water injection. The project is expected to increase oil production by about 17 MMbbl.

Investments for the project are an estimated $281 million, according to the NPD.

—Staff Reports

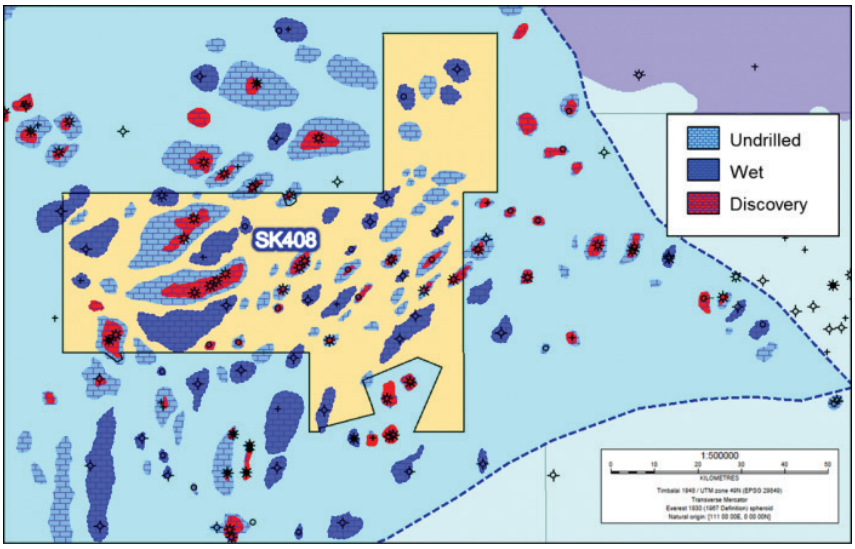
EXPLORATION

Sapura Energy Bets On Sarawak Prospects

Sapura Energy Berhad is betting big on gas prospects in the SK408 Block offshore Malaysia after making its ninth gas discovery.

"In line with our strategy to unlock the value of our gas fields and enhance long-term earnings visibility of our E&P business, we will focus on realizing the full potential of our highly prospective gas fields in SK408 and strengthening our E&P portfolio," Sapura Energy President and CEO Seri Shahril Shamsuddin said in a regulatory filing to the Malaysia Stock Exchange.

Sapura Exploration and Production (Sarawak) Inc., a subsidiary of Sapura Energy, discovered gas in nine of the 11 exploration wells drilled so



Sapura Energy in betting big on offshore Malaysia. (Source: Sapura Energy)

far in the SK408 concession, which is considered to hold a large number of hydrocarbon prospects with significant potential.

"The Pepulut-1 [ninth] gas discovery is a continuation of Sapura E&P's exploration successes in the highly prolific area of SK408," the company said.

Pepulut-1, drilled in the second week of June, encountered what the company said is a "high-quality reservoir." The details of the gas discovery are yet to be disclosed.

The ninth gas discovery is located near three gas fields—Gorek, Larak and Bakong—which are identified for development in a cluster as part of Phase 1 later this year.

The upstream company is considering whether to include Pepulut-1 discovery in the cluster development to further enhance the viability of the project's Phase 1 by leveraging on the common infrastructure, pipelines and facilities.

In April Sapura E&P made a final investment decision for development of the Gorek, Larak and Bakong fields as part of Phase 1 in the SK408 Block.

The three gas fields will be developed as three separate projects with wellhead platforms tied back to the existing F6 processing facility in a neighboring field, which is developed by Sarawak Shell. The processed gas will be transported to the Malaysia LNG (MLNG) complex at Bintulu on Sarawak coast.

The cost of the Phase 1 development is estimated $200 million over a three-year period, and first gas delivery will target the first quarter of 2020.

Sapura E&P Sarawak will be the operator of the Larak and Bakong fields, while associate partner Sarawak Shell Berhad will operate the Gorek Field. The three gas fields are estimated to hold gas reserves of more than 42 Bcm (1.5 Tcf) of gas in place. During exploration, Bakong-1 well hit a gross gas column in excess of 600 m (1,968 ft) in the primary target reservoir located within Late Miocene Carbonates. Larak-1 well discovered a gross gas column of 333 m (1,092 ft) and nonassociated natural gas, while Gorek-1 well found a gross gas column of 235 m (770 ft) within the same Late Miocene Carbonate.

"The development of the SK408 gas fields further strengthens Sapura Energy's position in Malaysia as a significant partner and supplier of natural gas to one of the world's largest LNG production facilities, the Petronas MLNG complex in Bintulu," Shahril Shamsuddin said.

After this, Sapura will take up development of the remaining gas discoveries, which include Jerun-1 (gross gas column 800 m or 2,624 ft), Teja-1 (gross gas column 219 m or 718 ft), Legundi-1 (gross gas column 139 m or 456 ft) and Jeremin-1 (gross gas column 104 m or 341 ft).

Jerun-1 is the largest gas discovery in the SK408 Block so far. It is located about 5 km (3.1 miles) north of the Bakong gas find. Analysis of electric log, pressure and sample data from Jerun 1 suggests a "gross gas column of around 800 m (2,624 ft) in the primary target reservoir, with multi-Tcf potential."

SK408 is spread across an area of 4,480 sq km (1,729 sq miles) within the Central Luconia Gas Basin in water depths ranging from 61 m to 122 m (200 ft to 400 ft). The concession is located between 120 km and 180 km (74 miles and 111 miles) off the Sarawak coast.

SapuraKencana has a 40% participating interest in SK408 PSC while Petronas Carigali and Sarawak Shell own 30% each.

—Ravi Prasad

EXPLORATION BRIEFS

Norway Awards Oil Permits To 11 Firms In Arctic Licensing Round

Norway has awarded 12 oil and gas exploration licenses to Equinor and 10 other companies focused mostly on the Arctic, where Oslo believes it has the greatest potential for significant new discoveries.

Nine of the licenses are located in the Barents Sea and three in the Norwegian Sea off central Norway, the Ministry of Oil and Energy said June 18.

Equinor (formerly Statoil) was awarded five licenses and will participate as a nonoperating participant in another two. "In contrast to the awards of the 23rd licensing round, the majority of these awards are less mature and therefore require more work before the drilling candidates are ready," Equinor said in a statement.

The award includes one firm commitment to drill an exploration well in the southwestern part of the Barents Sea, the company added.

Shell, Aker BP, Lundin, OMV and Spirit Energy, a joint venture between Britain's Centrica and Germany's Bayerngas, also were offered operatorships. In addition, DEA, Idemitsu, M Vest Energy, VNG and Wintershall were awarded participating interest.

The number of firms applying for blocks in the 24th licensing round fell to 11 from 26 in the previous round two years ago, with analysts pointing to last year's disappointing exploration campaign that resulted in a few minor discoveries.

Aker BP won operatorships in two licenses located near Bear Island, although the government said drilling would be banned between April 1 and Aug. 15 to protect important nesting grounds for Arctic Birds.

CNOOC Developing Deepwater Gas Block In South China Sea

China's offshore oil and gas producer CNOOC has started developing a new gas field in the South China Sea, the official Xinhua News Agency reported June 19.

The Lingshui 17-2 gas field is the first deepsea gas block fully operated by a Chinese company, Xinhua said citing CNOOC officials. The deepwater project, which was discovered in 2014, is 150 km (94 miles) south of China's southern Hainan island, with an average operational depth of 1,500 m (4,921 ft).

CNOOC is ready to start building a subsea level platform used for drilling, Xinhua said.

—Reuters

TECHNOLOGY

Energy Companies Give Meaning To 'Digital Hype'

The energy industry has amassed tons of data from its upstream operations via sensors on equipment with data accessible through the cloud, but it is how the data are used that adds value, according to speakers at a recent digital technology event.

Norway's Equinor (formerly Statoil) and Royal Dutch Shell were among the companies sharing insight on their digital technology efforts and strategy during UNIFY 2018, a digital-focused event put on by Baker Hughes, a GE company (BHGE).

Torbjørn Folgerø, chief digital officer for Equinor, said the company is betting on digitalization to help it improve safety and reduce its carbon footprint of its operations; increase revenue by $2 billion; reduce offshore drilling costs by about 15%; lower future investment by about 30% compared to traditional oil and gas development; and improve safety performance among other goals.

"We are creating one subsurface data platform. … We see great potential to both increase the quality of the exploration portfolio but also to get more out of existing reservoirs," Folgerø said.

In the U.S., where Equinor has operated assets in the Eagle Ford, Bakken and Marcellus, the company is streaming data from more than 1,150 onshore wells at its remote operations center in Austin, Texas, to predict which wells could go down and sending in crews where it matters most, Folgerø explained. The system is code-based and aggregates data from several different systems.

"By using this tool, we gather a lot of analytics for field learning," Folgerø said.

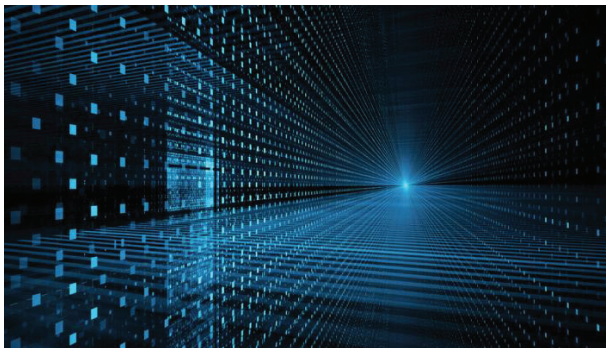
Knowledge and digital techniques gained here could be used at the company's integrated operations support and drilling operations centers—set to open this year—that aim to improve production and efficiency on Equinor's Norwegian Continental Shelf (NCS) assets. The company has said the centers will connect to all of its NCS installations to enable more proactive decision-making by better utilization of operating data and digital technologies.

More than 26 petabytes are stored in Equinor's data centers, the company said on its website. Folgerø said the amount of data has increased by more than 5 petabytes since 2012.

"These are raw data from our reservoirs, integrated data, equipment data from more than 40 operated assets on the Norwegian Continental Shelf," he said. "These data are not valuable [by itself] not until applied with a purpose. Combining all these data and learnings across our disciplines provide us with a better basis for decision-making and creating new business opportunities."

Equinor is not alone in its digital journey.

Mike Curtin, vice president of capital projects for Shell Oil, talked about the company's three-pronged digitalization approach that focuses on digitizing the existing business; adjacency, which involves how digital opens opportunities in areas similar to the company's existing business; and new business models, focused on finding new value propositions for customers and looking at new energies.



Companies in the oil and gas industry are embracing the digital revolution, looking for and finding ways to improve efficiency, grow revenue and create new business opportunities using digital technologies. (Source: Shutterstock.com)

"Digital is nothing new. …It's always been run on zeros and ones," Curtin said. "It's not a one-off thing. … We've got to give meaning to the hype."

Digitalization, he said, has typically been thought of in terms of how business is conducted and how it can be done better. The growing trend, he added, focuses on how it is going to change the business.

Curtin used the retail segment for example and the challenge of getting energy to consumers in new ways as the energy market becomes more electrified. Analytics is playing a role in helping Shell understand what its customers want, he said.

"In the adjacency model of retail, we're looking at new ways to get gasoline to our consumers in a different way," Curtin said. The company plans to roll out a service in some parts of the world that allows cars to be refueled as they sit in parking lots, he said.

Upstream, Shell—like many others—relies on oilfield service companies to help provide solutions. Shell has utilized BHGE's JewelSuite reservoir and well modeling software, which is known within Shell as PetroScience. The software allows the company to increase collaboration to better make decisions about reservoirs, Curtin said.

BHGE described JewelSuite on its website as software that "supports and provides integrated upstream workflows that promote the transfer of knowledge and quantified uncertainty between oil and gas disciplines." It gives teams the ability to "utilize new, near- and real-time data inputs and analytics to accelerate and optimize field development plans, drilling operations and production."

"It seems like a very simple concept but the challenges of scale, focusing on important data, making the things

that should be easy to do, getting people out of the business of moving data from one platform to another and freeing them up to actually make some decisions is hugely valuable," Curtin said.

Like other companies, Curtin acknowledged that sometimes the challenge is around getting started on digital initiatives, moving from the novelty of a new technology to a business-centered approach. To assist in this regard, Shell formed "accelerators" aimed at driving big ideas in an agile way, learning how to scale and quickly rebound from failures, he said.

The intent is to have an outcome-focused approach.

Equinor's Folgerø added that it is also important to ask the right questions and know the purpose of data.

"Data can provide you with an extreme amount of answers but that doesn't really help if you don't know what to ask for and what to search for," he said.

—Velda Addison

TECHNOLOGY BRIEFS

Saab Seaeye Takes More Control Via Satellite Link

Saab Seaeye has further enhanced its system for global remote control of their electric underwater robotic vehicles via satellite link and 4G networks.

Satellite-linked operations have seen the Leopard undertake complex tasks while under the direct remote control of a pilot located at a shore base several thousand miles away. (Source: Saab Seaeye)

Remote control of the company's Leopard electric robotic work vehicles has now been upgraded to include control of the Tether Management System.

Such remote operations will bring considerable savings to the oil and gas industry by reducing the need for offshore piloting personnel and advancing the potential for long-distance control of remote resident systems, Saab Seaeye said.

Earlier successful trials of the concept proved that its iCON intelligent control architecture can overcome the poor signal problems of low bandwidth and high latency challenges, typical of satellite communications, including coping with a 20% data drop out.

Rigorous, satellite-linked operational testing has seen the Leopard undertake complex tasks while under the direct remote control of a pilot located at a shore base several thousand miles away.

Fingertip remote control of the Leopard by the pilot enabled him to perform a step-by-step operation of mating and un-mating underwater connectors.

At the same time, the piloting operation was deliberately challenged by a 20% data dropout to prove the capability of Saab Seaeye's advanced iCON intelligent control architecture over a satellite link.

Other robotic work and inspection vehicles can be controlled in this way, including the company's Sabertooth AUV, a hybrid system that can operate as both a roaming AUV and an ROV that can perform light work tasks—and is an ideal system for long-term residency operations in remote locations, according to the company.

The financial and operational benefits to offshore operators will come from needing fewer technicians offshore—none in the case of remote resident locations—along with increased effectiveness as the control and management of complex tasks can be performed remotely by highly experienced pilots together with technical support staff and computer-aided control systems located at onshore locations across the globe.

The advanced communications capability, an integral option within iCON, offers operation via a low bandwidth link of 1.6 megabytes per second and high latency of up to 3 seconds.

An important future role for iCON, Saab Seaeye said, will be in the distant management of resident robotic systems that remain on station for a year at remote locations ready to be deployed on maintenance and inspection missions.

Sercel Extends Capability Of 508^{XT} Seismic Acquisition System To Transition Zones

Sercel announced on June 12 the launch of a transition zone version of its 508^{XT} seismic acquisition system. Seismic crews will now be able to deploy the 508^{XT} solution in marsh zones and water depths of up to 25 m (82 ft).

The T508^{XT} solution can be deployed in marsh zones and water depths of up to 25 m. (Source: Sercel)

Designed with reinforced hardware to withstand the complex challenges of operating in shallow water environments, the new 508 transition zone system also benefits from Sercel's unique fault-tolerant X-Tech cross-technology architecture, featuring local storage and automatic rerouting to maximize survey productivity.

Forum Energy Technologies Awarded Contract For Submarine Rescue Vehicle, ROV

Forum Energy Technologies Inc. has received an order from Submarine Manufacturing and Products Ltd. (SMP) on June 18 to supply a submarine rescue vehicle (SRV), a work-class ROV, and associated launch and recovery systems. The ROV and SRV will be delivered in 2019 and 2020, respectively, and integrated by SMP with additional equipment for delivery to a navy in the Far East.

The SRV, an onboard piloted rescue submarine, is similar to Perry's proven design of rescue vessels and will incorporate the most current subsea vehicle technologies. The SRV will be capable of operating in depths greater than 500 m (1,640 ft), and carrying a maximum of 19 people, and will be fully integrated with a hyperbaric rescue facility supplied by SMP. The SRV and ROV will be designed and manufactured at Forum's facility in Kirkbymoorside, U.K.

The Perry XLX-C series ROV will be used to support the SRV in its operations by assessing and preparing a site for a submersible rescue. The XLX-C will be fitted with Forum's latest technology and will be capable of delivering specialized equipment, including an emergency life support system, to a distressed submarine. A simulator, with a number of scenarios, will be supplied as a training aid for the ROV pilots.

The submarine rescue vehicle will be delivered for use in the Far East. (Source: Forum Energy Technologies)

"The choice of Forum's Perry vehicles validates that our subsea technological capabilities are applicable to a wide range of uses outside of our traditional oil and gas arena," said Prady Iyyanki, Forum's CEO. "Our subsea team has done a great job diversifying into other applications. This is the largest multiyear subsea order we have received since our 2012 IPO [initial public offering] and the first of the global non-oil and gas project awards we hope to obtain this year."

—Staff & Reuters

VESSEL BRIEFS

Shell Feeds Gas To Prelude FLNG Offshore Australia

Startup for the mammoth *Prelude* FLNG vessel moved a step closer when Royal Dutch Shell introduced natural gas to the unit as part of the cooling process, the company said on June 13.

Shell expects cash flow from *Prelude* this year, the company said. (Source: Shell)

A spokeswoman for Shell said that the gas came from the LNG carrier *Gallina*. The vessel departed the Prelude FLNG port on June 7, according to ship tracking data from Thomson Reuters Eikon.

"This will cool down the tanks and process equipment and pipework with gas and is an opportunity to test processes and systems before the subsea wells are opened at startup," the spokeswoman said.

While *Prelude*'s startup date remains unknown, Shell confirmed that it expects cash flow from the unit this year.

Japan's biggest oil and gas producer, Inpex Corp., is Shell's rival for declaring first gas from the region with two overlapping fields offshore northern Australia. Both companies have spent billions on maritime vessels designed to secure a share of the booming Asian LNG market.

Yinson In Talks On FPSO Deal In Nigeria

Malaysia-based Yinson Holdings Bhd is negotiating to engage a second FPSO offshore Nigeria, according to a filing on June 14, in a deal involving Schlumberger. The vessel would operate in the Anyala and Madu fields.

Yinson has deployed an FPSO, *Adoon*, in the Antan Field. It is expected to remain following its contract expiration in October, given the field's good production profile.

An AmInvestment Bank recent research report priced the existing FPSO at as much as $400 million. If the deal goes through, it will be acquired from third parties and upgraded before redeployment to offshore Niger Delta by fourth-quarter 2019. Capacity for the vessel is expected to be 50,000 bbl of oil and 3.3 MMcm/d (120 MMcf/d) of gas.

"Assuming a project internal rate of return (IRR) of 14%, project financing of 70:30 for debt to equity, we estimate that this new FPSO charter could raise financial year 2021 earnings by 29%. For now, we maintain our forecasts pending first oil completion," said AmInvestment Bank.

Schlumberger would contribute services in kind as well as capital for the project development until first oil.

"Given the relatively small value of the Anyala and Madu FPSO versus the US$1billion capex for the Ghana-based *John Agyekum Kufuor* vessel, we would not be surprised if the group is still looking for additional projects," said AmInvestment Bank. "Management earlier indicated that Yinson was eyeing FPSO charters from Brazil, Mexico and West Africa, which are up for tender."

—Staff & Reuters

BUSINESS

Brazil's Subsea Scenario Very Positive For Siemens AG

Siemens AG is considering strategic options, including a potential sale of its equipment for offshore operations in Brazil. The latest moves show that the German engineering company is working to take advantages of Brazil's subsea segment.

In April, 2018, Siemens AG received an order for four SGT-A35 gas turbine power generation packages and two SGT-A35-driven DATUM CO_2 compressor packages for MODEC's Sepia FPSO vessel. The vessel will be located in Petrobras' Sepia Field offshore Brazil in the Santos Basin pre-salt region, approximately 250 km (155 miles) off the coast of Rio de Janeiro.

In addition Siemens' services team entered into a long-term program over the 21-year operation of MODEC's FPSO vessel, providing parts and services to ensure the required availability.

Siemens AG still wants to expand its presence in Brazil and is looking at all opportunities within the Brazilian offshore segment, mainly because of oil auctions scheduled to be held by 2020, according to Armando Juliani, director of power and gas and power generation services at Siemens AG. Juliani said Brazil's oil and gas scenario is very positive, and the company has been preparing to add value for the customer to better serve upcoming opportunities.

"Based on the last bid rounds, with new entrants and classic players coming back, we see a minimum of three new FPSOs per year in the next five to 10 years," he told Hart Energy in an interview. He added that Brazil's oil and gas business scenario needs to keep walking ahead, allowing a medium-term visibility and clear and stable rules to make planning possible.

Juliani said Siemens AG is working on its next-generation of subsea transformers. "Optimized as the main transformer for Siemens' Subsea Power Grid, it is also suitable as a stepdown transformer for subsea boosting," Juliani said. "Its generic design can be utilized for subsea distribution transformers across a broad power."

He said additional Siemens equipment is designed for 3,000 m (9,843 ft) deepsea purposes, which means it's a perfect fit for presalt.

Juliani added that Siemens AG's Brazilian services are prepared to deliver local content on a competitive basis. Over the past few years, the company has delivered more than 60 compressing trains from a plant located in the state of Sao Paulo and more than 30 gas turbo power gen sets delivered from its plant in the state of Rio de Janeiro, with more than 50% local content.

"Nowadays, with the new REPETRO [law], most of these skids would cost at least 5% less to the end users and at the same prices if assembled in Europe, the Middle East or Asia—the difference will be the logistic to the carry over site," he said.

Siemens also has shown enthusiasm for the digital era. Most of the tools delivered by the Industry 4.0 are migrating to the oil and gas industry, according to a Siemens' spokesperson, who said part of the company's strategy for the implementation of disruptive technologies is to implement it in the subsea segment.

"Tools like the integrated engineering application, called COMOS, and Visualization XHQ have been broadly applied in Brazilian oil and gas, allowing for 'digital enterprise,' which encompasses the pre-FEED to decommissioning of a platform, for example," he said.

Recently, Siemens announced its first 3-D printed steam turbine parts. The computer-aided manufacturing device can help to develop oil and gas activities in Brazil, Juliani said.

"Very soon, most of our customers will reduce their inventory of spares implementing the spares on the web," he added. He said that would make it possible to download a file and print the parts needed onsite.

—Brunno Braga

BUSINESS BRIEFS

Cairn Buys Into Seacrest-backed British North Sea Oil Field

Cairn Energy has bought a 50% stake in the Agar-Plantain oil fields in the British North Sea from Azinor Catalyst, the companies said June 14.

The investment by Cairn is another sign that North Sea assets are becoming attractive again to oil producers, which sold assets in the past few years, often to private-equity investors, and cut costs after oil prices collapsed.

Azinor, which is backed by private-equity firm Seacrest Capital and owns a portfolio of North Sea assets, discovered the Agar-Plantain fields in 2014 and said on June 14 that it expected to start drilling in the third quarter of this year, pending regulatory approval.

Agar and Plantain have "estimated combined mid-case resources of 60 million barrels oil equivalent, with an upside case of 98 million barrels oil equivalent," Azinor said.

The companies did not say how much Cairn Energy paid for its stake.

Renewed interest in North Sea assets was highlighted last month when Royal Dutch Shell, BP and Norway's Equinor as well as smaller independent oil producers

including Siccar Point, Chrysaor and Premier Oil awarded 229 blocks in the British North Sea.

Equinor Awards Light Well Intervention Contract To Akofs

Akofs Offshore has been awarded a contract for light well intervention services using the *Akofs Seafarer* vessel for all Equinor-operated licenses in the period 2020 to 2025, the companies announced on June 19.

Equinor is the operator of about 560 subsea wells onstream on the Norwegian Continental Shelf. The wells require maintenance, repairs and new production actions. In 2017 Equinor performed 55 light well intervention operations, the average breakeven for new production being less than $4/bbl.

Granted for a period of five years the contract for wireline operations on Equinor's subsea wells includes an option for a three-year extension. The estimated contract value for the five years is slightly less than NOK 3 billion (US$365 million). Among the services included in the contract are running of well control package, wireline services, ROV, some logging services and well tractor use.

Akofs Seafarer is 156 m (511 ft) long and thus a substantially larger vessel than those formerly used for well interventions for Equinor.

"The past three years we have been performing light well intervention activities during the periods of the year with best weather. We now wish to perform all-year interventions, with a vessel working in the same way as mobile rigs when it comes to waiting on weather. This is a robust vessel which will be able to operate large parts of the year," said Geir Tungesvik, Equinor's senior vice president for drilling and well.

The contract is a continuation of the letter of intent signed between Equinor and Akofs Offshore on May 16.

Akastor ASA entered into a share purchase agreement with Mitsui & Co. Ltd. and Mitsui O.S.K. Lines Ltd. on June 19 for transfer of 50% of its shares in Akofs Offshore to form a joint venture ownership. Akofs Offshore is a subsidiary of Akastor.

Equinor, Microsoft To Partner For Cloud Services In Norway

Equinor and Microsoft have entered into a strategic partnership agreement, the companies announced on June 20.

As part of the agreement, Equinor will provide industry knowledge and business needs to support Microsoft in developing new solutions for the oil and gas industry. Microsoft will provide expertise to accelerate Equinor's IT development and establish new data center regions in Stavanger and in Oslo.

The partnership with Microsoft enables Equinor to shape and accelerate the development of fit for purpose IT services for the energy industry, and secure a faster transition to the cloud. Leveraging the cloud is a prerequisite for the energy industry's transformation towards a digital future. Secure, reliable and cost-efficient operations are a requirement for Equinor's adoption of the cloud.

The strategic partnership is a seven-year consumption and development agreement in the hundreds of millions of dollars, according to Equinor. The agreement will be a platform to identify innovative solutions for the energy industry and further capitalize on common business opportunities.

The development of new cloud infrastructure in Norway will support economic development by enabling companies and industries to realize the benefits of the cloud, such as in-country residency.

Cloud services from Microsoft's new data center locations are planned to come into operations with initial availability of Azure services in late 2019.

—Staff & Reuters

UPCOMING

The next issue of *Subsea Engineering News* will be distributed July 12. Until then, visit *epmag.com*.

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