

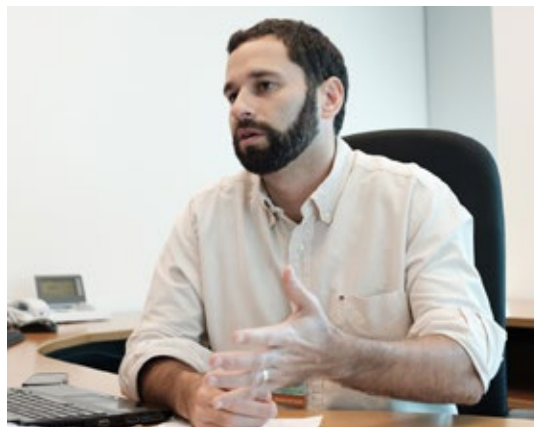
## Petrobras Weighs Flexible, Rigid Risers For Presalt Fields

Challenges posed by the hostile environmental characteristics of Brazilian presalt oil and gas fields have prompted Petrobras to weigh use of rigid risers instead of flexible risers, which are mostly used by the company offshore Brazil.

Such characteristics include polluting gases, specifically CO<sub>2</sub>. Challenges have resulted in what experts call stress corrosion cracking, which causes riser structures to fail, suspending production of fields and threatening the environment with possible oil and gas leaks. Petrobras is evaluating how flexible risers can be improved to avoid corrosion during E&P presalt activities.

The company's eyes were opened to the problem after there were two failures regarding TechnipFMC-supplied risers in 2017 in the Lula and Sapinhoá presalt fields, two of the company's top producing fields. The incidents prompted Petrobras to think about changing its pipeline connections in presalt fields using rigid risers.

"Petrobras' goals are always to seek the best technical solution for each project," Felipe Matoso, subsea engineering general manager for Petrobras, said in October 2017. "We have a greater tradition of using flexible risers mainly because we have a local industry more focused on flexible risers. But today our goal is to seek competitive-



Petrobras is evaluating use of rigid and flexible risers for its presalt assets, according to Felipe Matoso, the company's subsea engineering general manager. (Source: Flavio Emanuel, Petrobras)

ness in that segment, according to project characteristics."

Matoso said Petrobras is planning to promote a competition between rigid and flexible risers to evaluate which solution is best for each presalt project.

Petrobras has not set a time line for its riser model evaluation process for presalt fields.

But "choosing the best strategy will address technical and economic issues, promoting competition between different solutions, according to project characteristics," the company said in a statement. "Petrobras has in its register the main sup-

pliers of this equipment worldwide. Other companies will also be in the process of technical qualification."

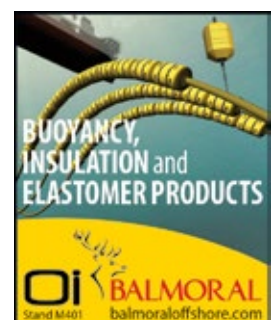
### Flexible Risers

For more than two decades, flexible risers have been successfully adopted in Brazil's deep and ultradeep waters, and Petrobras decided to bring this equipment to its presalt fields.

Comprising various layers of different materials such as an inner flexible metal carcass, leak-proof thermoplastic barriers and spiral wound, corrosion-resistant steel, use of flexible risers dates back to the early 1970s when they were used in relatively benign and shallow-water areas such as offshore West Africa, the Far East and the Mediterranean.

### WHAT'S INSIDE

ExxonMobil, Partners Make Strides Offshore Guyana.....	2
Aker BP Stepping Up Exploration Game In 2018.....	6
Improving Safety Through Advanced Composite Technology ...	8
Shell Shares Steps To Reducing Costs In GoM.....	13



Today the equipment can reach up to nearly 2,250 m (7,382 ft) water depth in configurations that include the “steep S” and “lazy S,” using anchored buoyancy modules, as well as the “steep wave” and “lazy wave,” incorporating buoyancy modules. Flexible risers are able to withstand severe vertical and horizontal motions in adverse weather conditions.

TechnipFMC is Petrobras’ main supplier for flexible risers, although NOV and GE also have contracts for flexible risers supply services. It is estimated that Petrobras can spend up to \$300 million for each contract.

### Rigid Risers

The possibility of contracting rigid risers for Petrobras can mean business for more supply companies, such as Vallourec and Tenaris, which work in this segment.

Some say there are some benefits for rigid risers.

“Rigid risers can be very competitive in the presalt E&P activities. They are cheaper and have more resistance against corrosion,” Ilson Paranhos of Rio de Janeiro Federal University said.

He added that rigid risers typically have a service life of between 25 and 30 years, and they can handle the HP/HT conditions typically found in Brazil’s ultradeep water.

However, “other aspects must be evaluated such as logistics and the presalt characteristics,” Paranhos added.

He explained that the corrosion resistance of rigid risers is guaranteed by the high properties of the carbon steel used, which is coated internally with a layer of corrosion-resistant alloy (Inconel) through a clipping process, a technology known for decades and widely used in the global offshore sector.

“The advantage of using the rigid riser is the possibility of manufacturing lines lighter and [in] larger diameters, which offer greater oil flow and, consequently, greater capacity of production,” explained Vallourec Superintendent of Quality Júlio Márcio Silva. “Rigid pipes have an internal diameter of 14 inches. They can produce more with less cost [for] infrastructure, installation and maintenance.

Over the past 10 years, Petrobras’ presalt activities have been successful. Currently, presalt activities account for roughly 50% of Brazil’s total oil output of 2.6 MMbbl/d. Production is expected to grow further as new auctions set for this year and 2019 work to lure potential investment.

—Brunno Braga

## DEVELOPMENT

### ExxonMobil, Partners Make Strides Offshore Guyana

A larger FPSO unit and subsea systems could be in store for Phase 2 of the ExxonMobil-operated Liza development offshore Guyana.

Jeff Woodbury, vice president of investor relations for ExxonMobil, gave an update on operations offshore Guyana on the company’s fourth-quarter 2017 earnings call. ExxonMobil has submitted an application for an environmental permit to develop Phase 2 of the Liza development as Phase 1 progresses on schedule toward first oil in March 2020.

“We have production capacity of 220,000 barrels of oil per day with startup expected by mid-2022,” Woodbury said of the Liza Phase 2 facility concept.

Liza Phase 1 remains on track. Conversion of the very large crude carrier to an FPSO vessel is progressing, and development drilling is set to start later this year.

ExxonMobil affiliate Esso Exploration and Production Guyana Ltd. (45%, operator) and partners Hess Guyana Exploration Ltd. (30%) and CNOOC Nexen Petroleum Guyana Ltd. (25%) have discovered more than 3.2 Bboe of estimated recovered resources on the Stabroek Block, which spans more than 26,800 sq km (10,347.5 sq miles).

The Payara discovery is being planned as the third development offshore Guyana, according to Woodbury. Development here will follow Liza Phase 2.

“Payara has the potential to raise Guyana’s production to about 450,000 barrels of oil per day in total,” Woodbury said.

The update followed news in early January that ExxonMobil and partners had added to the success story offshore Guyana when the Ranger-1 well struck oil.

Greg Hill, president and COO of Hess, said the Ranger-1 well struck 70 m (230 ft) of high-quality oil-bearing carbonate reservoir. He pointed out that at its location 97 km (60 miles) northwest of Liza, the play is working in terms of charge. He fielded several questions from analysts Feb. 5 on the company’s fourth-quarter earnings call on the topic.

“We see a number of additional features on the block. That says the carbonate system is working. Now, obviously, we’ve got to get wells in those eventually,” Hill said. “But it bodes very well for the block in Guyana and potentially even Suriname as well.”

Plans are for a delineation well to be drilled at Ranger later this year.

The discovery followed the Liza, Payara, Snoek, Liza Deep and Turbot discoveries, proving another new play on the block.

Hill put the locations of some of the discoveries in perspective, noting in particular Turbot’s location 48 km (30 miles) southeast of Liza and Ranger’s location northwest

of Liza show the petroleum system is working across the entire area.

“It also opens up other play types as being highly prospective in addition to the carbonates, so there are further play types on the block as well,” he said.

Additional exploration drilling is planned on the block for 2018. This includes appraisal at the Liza, Turbot and Ranger discoveries.

Hill called the developments offshore Guyana one of the world’s best return investments in the oil industry and said, “we are extremely well-positioned to capitalize on it and to prefund it with the cash that we have not just for FPSO one but for FPSO two. Those financial

returns are going to distinguish our company for many years to come.”

So what’s behind ExxonMobil’s success offshore Guyana? Woodbury pointed to technology applied to subsurface imaging, which he said positioned the company to see what others hadn’t in the past.

“You’ve seen the result. We’ve got six very substantial discoveries there, and the economics are very robust,” Woodbury said.

He added, “The cost of supply for Guyana is very low. I think we, with our partners, are very well-positioned to capitalize on it, and we’re leveraging our global deepwater capabilities in doing do.”

—Velda Addison

### Indian Companies Move To Develop Mumbai Marginal Fields

India’s three upstream companies have lined up separate plans to develop marginal/small discovered fields in three contract areas offshore in the Mumbai Basin in a cluster method by sharing existing subsea infrastructure of neighbors.

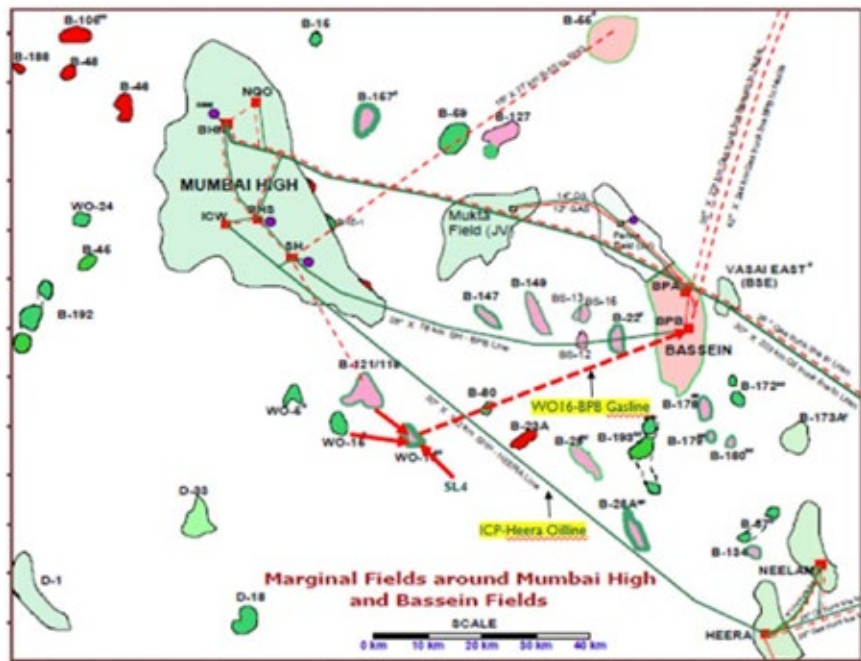
The contract areas, awarded in 2017 as part of a discovered small fields bidding round, are B-9, B-37 and B-80.

Adani Welspun Exploration Ltd. (AWEL) is preparing to drill 12 development wells and install offshore production facilities in B-9 while Sun Petrochemicals Ltd. is looking to drill 16 wells with subsea structures in B-37.

A consortium led by Hindustan Oil Exploration Co. Ltd. (HOEC) plans to drill and complete six wells and reenter three existing wells in B-80.

“We have provided several incentives to the investors to make the development of discovered small fields economically viable, such as waiver of customs duty on goods and services imported for the projects and provision to use the existing infrastructure in the adjacent fields developed by NOCs [national oil companies],” a petroleum ministry official said.

The prospects in the three contract areas were discovered by the state-run upstream company ONGC Ltd. but remained undeveloped as they were deemed to be marginal and below the economic threshold for development.



(Source: Hindustan Oil Exploration Co. Ltd.)

All of the prospects are located near producing oil and gas fields operated by ONGC in the Mumbai Basin.

#### B-9

Adani Welspun proposes developing three prospects in B-9 with 12 development wells in a cluster method. The prospects are B-9 (gas), B-7 (gas) and BRC (oil).

The development plan involves drilling seven wells in B-9, three in B-6 and two in BRC and installing two wellhead platforms in B-9 and one each in the B-7 and BRC areas.

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The plan includes laying a 10-km (6-mile) intra-field subsea pipeline (up to 8 in.) within the B-9 area and a 80-km (50-mile) subsea pipeline (up to 10 in.) from the B-9 Field to a nearby operator's existing wellhead platform.

"Platform jackets [are] being considered as mono-towers or three-legged jackets or alternatives. Subsea completions of wells may also be explored as options if economically viable," Adani Welspun said in a report.

The operator will use neighboring ONGC's existing Mumbai High North offshore and processing facilities to produce oil and gas.

Peak production rate from B-9 and B-7 is expected to be about 32 million standard cubic feet per day (MMscf/d) and 21 MMscf/d, respectively, for a plateau period of four years. The two wells in BRC are expected to produce 80 bbl/d for a plateau period of two years.

Initial studies indicate that in-place oil and gas reserves for these three prospects are estimated at 4.5 Bcm (158.4 Bcf), 2 Bcm (69.5 Bcf) and 73 Mbbbl, respectively.

AWEL holds 100% participating interest in this concession.

### B-37

Sun Petrochemicals has a plan to develop four prospects in B-37 area with 16 wells. The prospects are B-37 (oil and gas), B-51 (gas), B-174 (gas) and B-183 (gas).

The plan includes drilling four development wells in each field, laying subsea pipelines, installing a production platform to process produced fluids and hot-tapping into ONGC's existing Neelam Process Complex for evacuation of oil and gas.

Drilling will target the Mukta, Bassein and Bombay pay zones (Early Oligocene to Middle Oligocene). Four exploration wells (B-37-1, B-37-4, B-51-1 and B-174-1), drilled by ONGC in the late 1990s, established the presence of hydrocarbons in the two formations.

The in-place oil/gas reserves in B-37, B-51, B-174 and B-183 are estimated to be 7,990 Mbbbl and 2.2 Bcm (77.84 Bcf), 680 MMcm (24.028 Bcf), 1.5 Bcm (52.28 Bcf) and 69 MMcm (2.437 Bcf), respectively.

The four prospects are located 7 km to 20 km (4 miles to 12 miles) from the producing Neelam, Bassein and Vasai East fields operated by ONGC.

Sun Petrochemicals owns 100% participating interest in this concession.

### B-80

HOEC is looking to develop the prospects in the B-80 area. The company intends to drill six new development wells and reenter and complete three existing wells (B-80-1, B-80-2 and B-80-4ST). Drilling will target hydrocarbons in the Panna pay zone (Palaeocene to Early Eocene) in B-80, which is estimated to have in-place reserves of 297 MMcm (10.496 Bcf) of gas and 13,267 Mbbbl of oil.

The plan includes hiring a mobile offshore processing unit (MOPU) to process produced fluids and laying two separate subsea pipelines and hot-tapping into ONGC's ICP-Heera line and the WO16-BPB line for evacuation of oil and gas.

"The MOPU will have the capacity to handle 10,000 bbl/d [of] liquid and 15 MMscf/d [of] gas. Six subsea wells will be connected to the MOPU," HOEC said in a report. "Hot-tapping jobs will be carried out to ONGC's oil and gas pipelines, respectively, and trunk lines will be connected to the MOPU. Processed oil and gas after measurement at the MOPU will be transported using these pipelines to Heera and Bassein station."

The prospects in B-80 are located about 20 km from the producing Bassein and Vasai East fields.

HOEC and Adbhoot Estates have equal participating interest of 50% in this block.

—Ravi Prasad

## DEVELOPMENT BRIEFS

### Hess Begins Production At Stampede In GoM

Production has kicked off at the Hess Corp.-operated Stampede development in the U.S. Gulf of Mexico (GoM), the company said Feb. 5.

Discovered in 2005, the field spans several blocks in the GoM's Green Canyon area.

"We completed subsea work, received regulatory approval for production operations, and continued drilling at the fourth production well and first water injection well," the company said.

Partners in the Stampede development are Chevron subsidiary Union Oil Co. of California, Statoil and CNOOC Ltd. subsidiary Nexen Petroleum Offshore U.S.A., each holding a 25% working interest.

Speaking during the company's fourth-quarter earnings call, COO Greg Hill said the company plans to

gradually ramp up production over the next 18 months. He was cautious not to give a peak production profile and time, as the company wants to get dynamic data on wells at the field.

The facility is designed for a gross topside processing capacity of about 80,000 bbl/d of oil, 40 MMscf/d of natural gas, and 100,000 bbl/d of water injection capacity, CNOOC said Feb. 6.

Production facilities for the deepwater oil and gas field, which has a reservoir depth of about 9,144 m (30,000 ft) with a water depth of about 1,067 m (3,500 ft), consists of subsea production and injection wells tied back to a tension-leg platform. The current development plans calls for six producers and four water injectors.

The project, he said, was delivered "just over three years from sanction safely, ahead of schedule and under budget."

## Ocean Installer Secures Two SURF Contracts From Statoil

Ocean Installer said Feb. 6 Statoil awarded it two subsea umbilicals, risers and flowlines contracts comprising work from 2018 through 2020 on the Snorre, Troll, Njord, Åsgard, Bauge, Fenja and Dvalin fields.

The first contract is for subsea lines modification work with offshore activities containing complex riser change-out operations set to commence in second-quarter 2018.

The second contract Ocean Installer secured is for subsea lines modification under Statoil's Marine Wave scheme. This is the third Marine Wave, and Ocean Installer participated in the previous two as well. Offshore operations are scheduled for the 2019 and 2020 seasons and include firm work on Njord Future, Bauge, Fenja and Dvalin projects, with significant options to broaden the scope of the contract.

Project management on both projects will be handled by Ocean Installer's Stavanger office.

## Energiean, Stena Drilling Ink Development Contract For Karish Field

Energiean Oil & Gas has signed a contract with Stena Drilling Ltd. for the development drilling at the Karish Field offshore Israel.

As part of the contract, Stena Drilling will deploy the *Stena Forth* ultradeepwater drillship, or a substitute agreed to by both parties, to drill three development wells in first-quarter 2019. The contract also has a provision for a further option. The contract is subject to Energiean's final investment decision regarding the Karish and Tanin gas fields.

The *Stena Forth* will be mobilized from Las Palmas, Spain, where she is currently located. The Karish development program includes three development wells and production from a new FPSO vessel, about 90 km (55 miles) offshore. First gas is expected in 2021.

## Statoil Aims For First Oil From Carcara Field In 2023-2024

Statoil aims to start production from Brazil's Carcara oil discovery in 2023 or 2024, a company official said Feb. 7.

The discovery, where Statoil plans to drill one to three appraisal wells this year, could hold more than 2 Bboe, said Jez Averty, Statoil's exploration head for Britain and Norway.

"We believe that this could be a very high-value asset. This has potential to be our [Johan] Sverdrup outside of Norway," he told Reuters, referring to the large North Sea field Statoil is developing.

Partners in the Carcara license include ExxonMobil and Portugal's Galp.

## Husky Plans To Restart SeaRose Operations After Iceberg Probe

Canadian regulators on Jan. 26 lifted a suspension notice on Husky Energy's *SeaRose* floating production vessel off the coast of eastern Canada, allowing the company to resume operations on the 27,000-bbl/d project.

The Canada-Newfoundland and Labrador Offshore Petroleum Board earlier this month ordered the company to suspend operations after an investigation found that it had not followed its own procedure when an iceberg came too close to the facility in March 2017.

Husky did not disconnect the *SeaRose* FPSO vessel and sail away from the iceberg as it should have done, and at one point people onboard were ordered to "brace for impact." While the iceberg did not make contact with the *SeaRose* or underwater infrastructure, the response was against the company's own Ice Management Plan protocol, the regulator determined.

Husky completed a series of actions with the regulator to ensure a similar incident would not happen again.

The resumption of operations on the *SeaRose* was expected to take three days, the company said. The vessel

Tubular Bells  
First Oil  
November  
2014

Jack/St. Malo  
First Oil  
December  
2014

Lucius First Oil  
January 2015

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is located in the North Atlantic's White Rose oil field, about 350 km (217 miles) east off the coast of the prov-

ince of Newfoundland and Labrador.

—Staff & Reuters Reports

**EXPLORATION**

**Aker BP Stepping Up Exploration Game In 2018**

Fresh off of its submittal of three plans for development and operations for the Ærfugl, Valhall Flank West and Skogul developments offshore Norway, Aker BP is making plans to step up exploration activity for 2018.

Aker BP CEO Karl Johnny Hersvik said Feb. 2 that in addition to running four to five drilling operations in parallel through the year, near-term exploration is also among the company's focus areas.

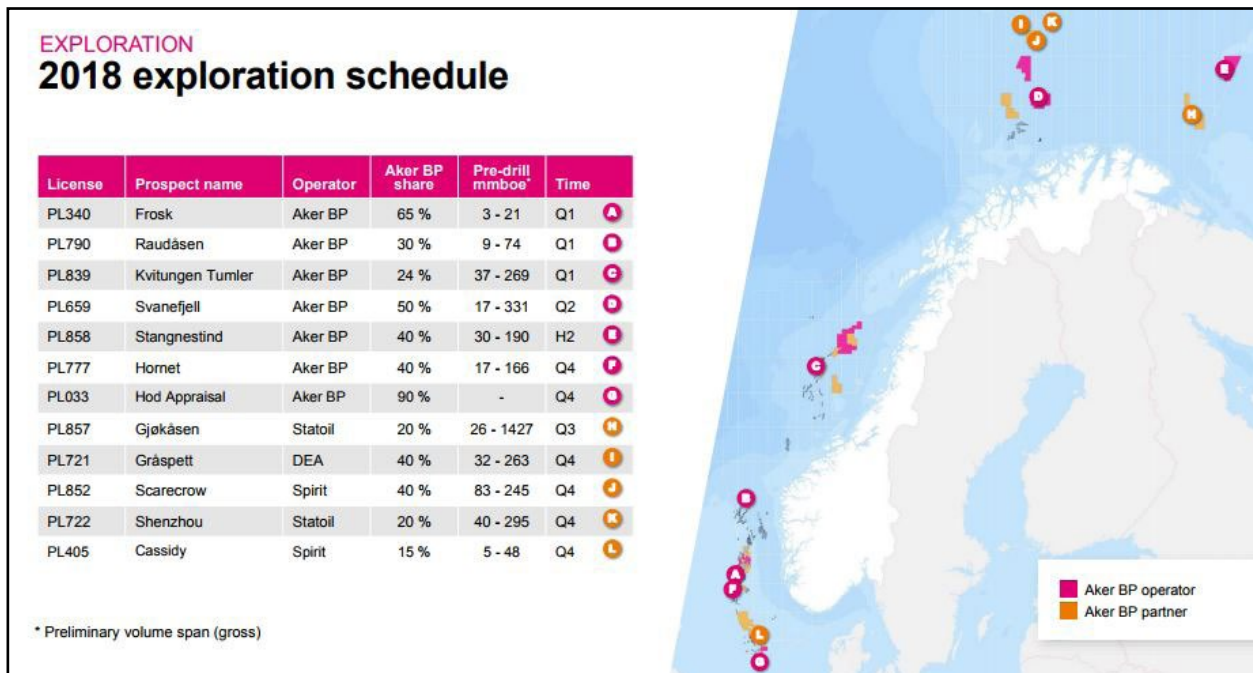
The company plans to drill at least 12 exploration wells this year. These include the Frosk exploration well in the Alveheim area, where drilling is currently underway, and the Kvitungen Tumler exploration well near Skarv in the North Sea.

sive resource potential. "These wells represent low-cost options that we think deserved to be drilled," considering recently gained drilling efficiency, a favorable tax system and low rig rates, he added.

Aker BP's 2018 exploration schedule includes the Cassidy prospect, a possible tieback candidate. Spirit Energy is the operator with Aker BP holding a 15% share.

Hersvik said one more exploration well could be added to this year's program. The company was awarded 23 licenses—including 14 as operator—by Norwegian authorities in January.

Aker BP pointed out that the license awards add growth opportunities for the company in the North Sea,



(Source: Aker BP)

"These are good examples of near-term exploration that if successful will generate significant value and positive synergies with our existing hubs," Hersvik said.

In addition to Frosk and Kvitungen Tumler, four more wells will be drilled in the North Sea and six in the Barents Sea, where Hersvik said the company is looking for standalone potential. He cautioned that the risks are also high, especially given disappointing exploration results seen in the region in 2017.

However, Aker BP is not passing on an opportunity to find hydrocarbons in this region that holds mas-

Norwegian Sea and Barents Sea while strengthening its position near existing hubs. Seven of the license awards are in the Ula area; five in the Ivar Aasen/Johan Sverdrup area; two in the Skarv area; and one each in the Alveheim and NOAKA areas.

License 916, the one near Johan Sverdrup, contains a prospect that Aker BP hopes to drill in 2018.

"This is definitely one to watch," Hersvik said.

Aker BP holds a 40% interest in and operatorship of PL 916.

—Velda Addison

## BP Makes Two Discoveries In UK North Sea



Both wells were drilled by the Paul B Loyd Junior rig in summer 2017. (Source: BP)

BP has made two new oil and gas discoveries in the U.K. North Sea, the company said Jan. 31, giving new impetus to its plans to boost production in the aging basin into the middle of the century.

The new discoveries are also the latest bright spot for the North Sea after a number of large new fields started up in recent years, helping to reverse a long and gradual decline in output since the late 1990s.

“These are exciting times for BP in the North Sea as we lay the foundations of a refreshed and revitalized business that we expect to double production to 200,000 barrels a day by 2020 and keep producing beyond 2050,” said Mark Thomas, BP North Sea regional president.

BP said it had made one discovery named Capercaillie in Block 29/4e in the central North Sea and another branded Achmelvich in Block 206/9b West of Shetland. Both wells were drilled by the Paul B Loyd Junior rig in summer 2017. The size of the resource was not disclosed.

The discoveries will help boost production from BP’s recently launched Quad 204 Field in the West Shetlands

as well as the Clair Ridge Field, which is due to come into production this year, Thomas said.

With seven field startups in 2017, and five set to start in 2018, BP plans to boost its production by 800,000 bbl/d by 2020, which will be mostly gas. It produced about 3.5 MMbbl/d last year.

The company will nevertheless not change its spending plans because of rising global oil prices and is preparing to approve projects this year that can make money with prices below \$40/bbl, according to the head of its oil and gas division Bernard Looney, speaking to Reuters on Jan. 30.

### New Fields

And as oil prices recover to about \$70/bbl after a three-year downturn, so is activity in the North Sea.

“The U.K. offshore oil and gas industry is stirring back to life, fueled by a robust uptick in the number of field development projects,” consultancy Rystad Energy said.

Up to 13 fields in the U.K. North Sea are expected to get the go-ahead for development in 2018, compared with only four in the past two years, Rystad said.

BP is 100% owner of Capercaillie while the Achmelvich well is operated by BP (52.6% stake) with Royal Dutch Shell (28%) and Chevron (19.4%), BP said in a statement.

The Capercaillie well was drilled to a total depth of 3,750 m (12,303 ft) and encountered light oil and gas-condensate in Paleocene and Cretaceous-age reservoirs. The well data are under evaluation. Options are expected to be considered for a possible tieback development to existing infrastructure.

The Achmelvich well was drilled to a total depth of 2,395 m (7,858 ft) and encountered oil in Mesozoic-age reservoirs. Evaluation and interpretation of the well results is ongoing to assess future options.

—Reuters

## EXPLORATION BRIEFS

### Total Buys Stakes In Blocks Offshore Guyana

Total has bought stakes in some offshore Guyana oil production blocks, boosting its presence in the potentially lucrative Guyana Basin.

The French major said it was buying a 35% working interest in the Canje Block in an agreement signed with an affiliate of Canadian company JHI Associates Inc. and Guyana-based Mid-Atlantic Oil & Gas Inc. These two companies will retain a shared 30% interest alongside operator ExxonMobil, which has a 35% stake.

Total has also bought a 25% working interest stake in the Kanuku Block in an agreement with Repsol and

Tullow Oil. Repsol and Tullow each have stakes of 37.5% in that block.

Total added it had an option to buy a 25% working interest in the Orinduik Block in an agreement with Canadian company Eco Atlantic Oil & Gas Ltd, which will retain a 15% interest following exercise of the option, alongside Tullow Oil which has 60%.

### Erin Discovers Hydrocarbons At Oyo-NW Well Offshore Nigeria

Erin Energy Corp. said on Jan. 31 it has completed the drilling of the Oyo-NW well and discovered hydrocarbons in the Miocene Formation.

The well is located about 9.5 km (5.9 miles) northwest of the Oyo Central Field on the company's offshore Nigeria Block 120.

The Miocene Formation is where several of Erin Energy's neighbors have discovered billions of barrels of hydrocarbons and from which several hundred thousand barrels per day are produced offshore Nigeria. The company is completing well suspension activities so it can reenter the well in the future for possible production.

The well was successfully drilled to the proposed total vertical depth subsea (TVDSS) of 3,724 m (12,218 ft) and penetrated multiple sand units with total gross thickness of 79 m (260 ft) in the depth range from 2,149 m to 3,314 m (7,052 ft to 10,873 ft) TVDSS as interpreted from wireline log data.

Preliminary evaluation of the well data shows that the two main sand units, the Miocene U7.0 and U8.0, with a gross thickness of approximately 25 m (83.6 ft) are hydrocarbon-bearing. Work has commenced to estimate the discovered volumes and to determine the relevant appraisal and development program.

### Shell Hits Oil In Deepwater US GoM's Perdido Area

Shell Offshore Inc. said it has made one of its largest discoveries in the U.S. Gulf of Mexico (GoM), hitting more than 427 m (1,400 net ft) of oil-bearing pay in the Perdido area.

Located in Alaminos Canyon Block 772 near the Shell-operated Silvertip Field and Perdido platform, the Whale discovery is in about 2,438 m (8,000 ft) of water. Drilling operations for the well were completed in June 2017 to a depth of about 6,995 m (22,948 ft), Shell said in a news release.

The company said evaluation of the discovery is ongoing, and appraisal drilling is underway to further delineate the discovery and define development options.

The discovery adds to Shell's Paleogene exploration success in the Perdido area. The company has added more than 1 Bboe resources through exploration in the last decade in the GoM, the release said.

Whale is operated by Shell (60%) and co-owned by Chevron U.S.A. Inc. (40%).

### Total, Chevron Make Major Deepwater Oil Discovery In GoM

Total said Jan. 30 that it and operator Chevron Corp. had made a significant oil discovery at the Ballymore prospect in the deep water offshore the U.S. Gulf of Mexico, its largest discovery in the area.



(Source: Total)

An assessment of the resource estimate was ongoing, the company said, adding that the discovery will bolster Total's new exploration strategy put in place since 2015.

The Ballymore prospect covers four blocks in the North Platte play in the Mississippi Canyon area, including Block MC 607 where the discovery was made.

Total's acquisition of a 40% working interest in Ballymore was part of an exploration agreement along with Chevron, which has 60%, signed in September 2017.

—Staff & Reuters Reports

## TECHNOLOGY

### Improving Safety Through Advanced Composite Technology

A unique landing string buoyancy design has introduced an improved system by leveraging composite technology. This system, built with 100% composite materials, improves safety in a number of ways. By looking at the challenges presented by offshore casing installation from a new perspective, engineers were able to introduce a technology that shortens the time needed to carry out this stage of the drilling program and allows the installation vessels to work without exceeding their maximum capacity.

#### History of composites application

Although the oil and gas industry has not been at the leading edge of applying composite solutions, other industries have used composites for decades to improve performance and safety. Among these is the aerospace industry, which has seen the use of composites double every five years since 1987. Composites have changed the landscape of the industry, allowing reduction in airframe weights, better fuel economy and lower operating costs.





Dressed landing string joints, which were made up in a controlled environment onshore, arrived to the drilling vessel ready to be deployed. (Source: Landing String Solutions LLC)

The same goes for the marine industry, where more than 90% of the hulls are composite, and the automotive sector, which boasts greater than 90% composite construction on heavy trucks used for long-haul transportation.

Composites are a top choice for construction across industries because of a number of desirable characteristics:

- Flexibility;
- High-impact resistance;
- Lightweight (with weight reduction ranging from 20% to 50%);
- Long field life;
- Low maintenance;
- Resistance to conductivity, corrosion and fatigue damage;
- Thermal stability; and
- Tolerance to damage.

### Composites In Offshore Solutions

Landing String Solutions (LSS) LLC came up with the idea of using composites in its landing string system at a time when no company in the oil and gas sector had taken this approach to buoyancy for a landing string.

According to Chris von Eberstein, vice president of LSS, “We wanted to provide an option to improve safe rig operations, optimize critical path time and significantly cut cost by reducing the hook load while running heavy casing.”

Part of the reason no one had tried it was because of the requirement to have a product that could contend with wellbore fluid. Nearly all composites used in drilling and production applications had been designed for use in seawater. Drilling mud is a different medium, with varying chemical components and temperatures. The challenges in coming up with the right material were considerable, but von Eberstein was convinced it could be done.

Antony Croston, business group director at Trelleborg, said his company applied its 40 years of experience in buoyancy systems and an understanding of how environments affect them to identify the mix of materials, addi-

tives and treatments to produce the best composite solution. “We looked at how each material failed and how it was degraded during testing to find a material we believed would work, then we set up experiments to test it.”

Trelleborg manufactures raw materials that include hollow glass microspheres that in their original form look like talcum powder but are, in fact, a high-strength glass bubble, Croston said. “It is the same type of composite used in high-performance aerospace applications, and in combination with other components in its finished form, the heart of the landing string system is essentially an extreme service buoyancy syntactic covered by a polyurethane skin.”

Croston explained that exposure tests were carried out on the composite in drilling fluid at specific temperatures and pressures, with the weight of the sample measured before and after. The results were measured against predetermined pass/fail criteria. Cyclic tests followed.

“We would pressurize it for a time and take it out, repeating over time to evaluate cyclic loading,” he said.

When tests results showed the right material had been found, developers knew they had found a solution that when implemented would introduce significant safety advantages in a novel way.

According to von Eberstein, it is important to understand that the composite is the enabler for this system.

“Operators would be reluctant to use a system deployed inside the riser if it had any metal parts because even a small piece of metal falling into the wellbore can do a huge amount of damage,” he said.

“In this particular application, this isn’t a better mouse-trap. It’s not a step change. This is a new trap altogether,” Croston said. “This is an enabling technology.”

### Advancing Safety

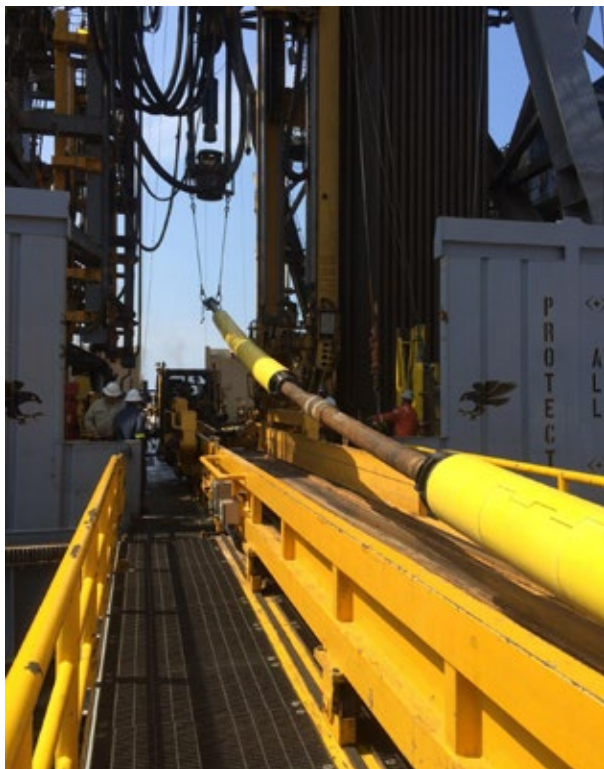
Safety was the impetus for developing this tool, von Eberstein said. The composite was the essential element needed to create a system that could work inside the riser without introducing risk of damage to the subsea wellhead system and casing, but the overarching goal was to address the risk of the rig exceeding its maximum designed hook load.

“We wanted to provide a tool to keep rigs working within safe design parameters,” he said.

Operators contracting vessels to set casing have to consider the specifications required for each installation. The weight of the casing combined with the landing string weight and the depth of the installation are the primary considerations when determining the necessary hook load, but sea state also is a factor.

The composite-based system creates buoyancy once the casing/landing string is in the riser, which reduces the hook load, decreasing the risk of the vessel exceeding its maximum hook load rating.

“This gives a smaller and cheaper rig the opportunity to do the job safely,” von Eberstein said. “It also means potentially eliminating liner tiebacks and running longer casing strings.”



A double stand of casing outfitted with the composite buoyancy system was picked up before being run into the hole. (Source: Landing String Solutions LLC)

Continuous operation cuts downtime, which not only improves safety by decreasing the amount of time workers are actively carrying out an operation, but also delivers efficiency gains in terms of contract length.

According to Croston, safety begins with the construction of the composite components in Trelleborg's controlled manufacturing environment. The individual buoyancy elements and securing clamp components arrive at the LSS site for assembly onto the landing string joints by a LSS specially trained crew. The dressed landing string joints are loaded into transport baskets and delivered to the drilling vessel ready to be deployed in exactly the same manner as traditional landing string pipe. By using quality materials and individual system components and following a controlled assembly procedure at the LSS facility, von Eberstein said, it is possible to ensure consistent results over multiple deployments.

Moreover, they reduce the risk of injury to offshore workers because the units are relatively light. Physically placing them on the landing string requires no heavy-lifting equipment.

"It can be accomplished in one man-lift," Croston said. Von Eberstein said this product is among those the company considers essential for reducing equipment failure and significant safety incidents in deep water.

"It is extremely difficult to accurately calculate dynamic loading effects when running/lifting casing strings," he said. "By using our system we can provide a means by which a rig can maintain its margin of safety."

As the LSS system has proven itself in offshore operations, the team is looking ahead to identify other applications for composites that will make it possible to improve offshore safety through reduced weight, increased wear and improved buoyancy.

—Judy Murray

## TECHNOLOGY BRIEFS

### Return To Scene, Mozenix Partner To Create Augmented Reality Application

James Fisher and Sons' Return To Scene Ltd. has teamed up with tech startup Mozenix to enhance augmented reality (AR) capabilities for the oil and gas sector.

The two companies are developing a mobile AR application called R2S AR to support the digitization and automation of oil and gas, a news release stated. This comes after the two completed a prototyping phase in late 2017.

"Offshore oil and gas assets are complex, adaptive structures with a constant flow of actions being undertaken by international teams. The systems which enable these actions are underpinned by asset registers, which are represented by physical tags attached to equipment," Martin MacRae, Return To Scene's head of product development and support, said in the release.

"The location of these tags, and the ability to visualize data in a certain way, is crucially important," MacRae added. "This is where AR technology and specifically



The two companies successfully completed the prototyping phase for a mobile AR application in 2017. (Source: Return To Scene)

Mozenix unique software delivery capability can solve myriad challenges."

### Trelleborg, Safe Marine Transfer Develop Subsea Installation Technology

Trelleborg and Safe Marine Transfer (SMT) are working to develop technology for the offshore installation and subsea operation arena using SMT's Subsea Shuttle, powered via jointly developed Pumpable Buoyancy technology.

According to a news release, the new technology enables subsea deployment of equipment and chemical storage. U.S. patents have already been issued and more are pending.

Working with a major international oil company, SMT recently completed Subsea Shuttle design testing and validation of performance at Seanic Ocean Systems' onshore test tank facility in Katy, Texas. The scale model performed as predicted from computational fluid dynamics and dynamic simulation studies, laying the foundation for qualification of dynamically adjustable Pumpable Buoyancy, the release said.

The buoyancy technology facilitates the transportation of equipment or chemicals safely from the surface to the seafloor on the deck of the Subsea Shuttle. This enables the placement of equipment or chemicals on the seafloor during normal operation or their return back to the sea surface and onto shore for equipment inspection, maintenance, repairs and upgrades as needed throughout the life of the field, the release said.

"Pumpable Buoyancy allows for real-time, in-operation modification of Subsea Shuttle uplift through the movement of specially engineered macro buoyancy spheres supplied by Trelleborg," the release said.

### ConocoPhillips, Statoil Back Downhole X-ray Technology In JIP

ConocoPhillips and Statoil Petroleum have signed a joint sponsorship development agreement with Visuray Technology Ltd. to fund the development of novel downhole technology that can evaluate the integrity of cement behind multiple casing strings in oil and gas wells, a news release said.

Called the VR360 diagnostic cement evaluation tool, the technology will produce a full 3-D cement map and complement traditional ultrasonic measurements, which are sensitive to the cement bond between the cement and the inner casing wall. The tool is based on Visuray-developed technology called the downhole X-Ray platform.

According to the release, development of the tool was initially stimulated by regulatory focus on deepwater wells, although a similar focus on the abandonment of wells in old fields has opened a new and important market for the service. In both applications, the tool is capable of obtaining information.

The joint industry project (JIP), which started Dec. 18, 2017, aims to deliver downhole prototype tools with a range of external diameters. The project is expected to last three years, during which time other oil companies may consider joining the project.

The prototypes will be jointly tested in oil and gas wells by the parties in the project, the release said.

—Staff Reports

## FLOATER BRIEFS

### Brazil Will Lead World In Planned FPSO Units By 2022

Almost all of the 55 planned FPSO units expected to begin operations worldwide by 2022 will be in Central and South American waters, according to a new report by GlobalData.

Offshore Brazil will be the global leader in the category as home to 24 of the vessels, with one each operating in the Falkland Islands and Guyana. Nigeria will host three new vessels and Angola will host four.

Not surprisingly, Brazil-based Petrobras will be the leading operator with 20 planned new vessels. Saipem SpA, Statoil ASA and Modec Inc. each plan to host three new FPSO units in the forecast period.

In the other regions

- Asia: Malaysia, China, Vietnam, Indonesia and India have one planned FPSO unit each;
- Europe: U.K. has two announced and one planned, and Norway has two planned;
- Elsewhere: Israel's FPSO unit is expected to start operations in 2020, Australia's vessel is planned to start in 2018, and North America's announced FPSO unit is scheduled to begin in 2022.

### Shutdown Of Ghana's Jubilee Field FPSO Unit Raises Concerns

FPSO *Kwame Nkrumah*, operating in Ghana's Jubilee Field, was shut down Feb. 1 for three weeks to repair a damaged turret bearing, partners in the project said.

Field operator Tullow Oil said it was the first of two shutdowns planned for the first quarter with the second beginning March 19. Another shutdown is planned for the fourth quarter.

The Atuabo gas processing plant will be shut during the first shutdown, but gas from the Tweneboa-Enyenra-Ntomme Field will be fed to the plant during the scheduled shutdown in March.

Samuel Bekoe, analyst with Ghana Oil and Gas for Inclusive Growth, expressed concern over the shutdowns, as they make it more difficult for the country to meet its revenue targets.

"In terms of building other FPSO units, we need to make sure we do not face such challenges," Bekoe told the *Xinhua* news agency.

However, Joseph Asenso, oil and gas head for Ghana's Ministry of Finance, countered that the impact from

the planned shutdowns had already been factored into the budget and GDP projections.

“So the impact—if it stays within the time frame—will not be felt, but if it exceeds, which is quite unlikely, that is when [we] will have a problem,” Asenso said.

Ghana’s assumed price for crude this year is \$57.30/bbl. With prices in the mid-\$60s, Asenso said he was optimistic that revenues would exceed expectations.

—Joseph Markman

## VESSEL BRIEFS

### Bluestream Orders Compact Cougars For North Sea Operations

Bluestream has ordered two Saab Seaeeye ROVs to bolster its entrance into the North Sea market.

The low-profile, gravity-based Saab Seaeeye Cougar XT Compact Zone II ROV systems fulfill regulatory compliance in the U.K. North Sea and bring Bluestream’s Cougar fleet to 22. The ROVs enhance the company’s full-scope inspection package by being suited for fixed or floating platform inspections.

Bluestream said in a statement that the platform-based inspection package will provide customers with significant cost savings. The slimmer design makes it easier to maneuver the Cougars inside complex structures, but powerful thrusters allow the vehicles to manage strong currents and turbulence.



Two Saab Seaeeye Cougar Compacts join Bluestream’s fleet for North Sea operations. (Source: Bluestream)

The Cougars’ smaller frame size, buoyance and weight, and a thinner 17-mm tether cable reduce the effects of drag. The six thrusters, however, allow it to handle a wider range of equipment than what would be expected for its size.

The two new vehicles will be equipped with Seaprince sonar, Kongsberg cameras and an underslung hydraulic skid for third-party equipment, which includes FlexiClean tooling, subsea water jetting, shear-cutter, subsea excavation pumps, subsea sensors and CP systems.

### CMR Lands CCTV Contract For Kongsberg Vessels

Kongsberg Maritime AS has ordered two closed-circuit television (CCTV) systems from CMR Group for its new



A photo illustration shows how the *OOS Serooskerke* and *OOS Walcheren* will appear. The two semisubmersible heavy-lift, construction and accommodation vessels are under construction. They will each be equipped with CCTV systems. (Source: O.O.S. International)

semisubmersible heavy-lift, construction and accommodation vessels under construction in China.

CMR’s system is part of Kongsberg’s effort to integrate its vessels’ electrical, telecommunications and integrated control systems. The systems, each of which incorporates more than 140 cameras, will monitor hazardous areas and other critical components and machinery, and be designed to withstand offshore operating conditions. They will be among the largest CCTV systems of their type.

The two vessels, *OOS Serooskerke* and *OOS Walcheren*, are under construction at China Merchants Heavy Industry (Jiangsu) Co. Ltd. near Shanghai. One is planned for a launch in South Korea in 2018 with the second set for early 2019.

### Petrobras Settles Taxes Owed For Vessel Leasing Contracts

Petrobras said on Jan. 29 it adhered to a federal tax refinancing program to settle taxes owed on vessel leasing contracts.

The company said in a securities filing that it would pay \$538.5 million in 12 monthly installments beginning in January 2018.

The payments would have a negative effect of \$348.4 million on fourth-quarter earnings, the company said.

—Staff Reports

## BUSINESS

## Shell Shares Steps To Reducing Costs In GoM

Since the oil price crashed in 2014 the industry has been scrambling to reduce capex and increase operational efficiency, and that has been achieved through renegotiated contracts, innovative working practices and applying new technology. This improved performance has not happened overnight but has been a gradual step change in the way projects are delivered and operated.

For evidence of this incremental approach there is no better example than Shell's operations in the Gulf of Mexico (GoM). The way Shell's own renaissance has taken hold since the oil price drop can be seen in four deepwater projects. It all began with a one-of-a-kind project that was already well underway when the oil price fell, which meant that the company was limited in its approach, through to the latest project where it effectively had a blank piece of paper and could redesign it entirely.

### Learning On The job

Shell's Stones development is the world's deepest oil and gas project, operating in about 2,896 m (9,500 ft) of water in an ultradeep area of the U.S. GoM. The project started production in September 2016 from a FPSO facility. The FPSO unit connects to subsea infrastructure, which produces oil and gas from reservoirs nearly 9,144 m (30,000 ft) below sea level. Stones is Shell's second producing field in the Lower Tertiary geologic frontier in the GoM, following Perdido in 2010.

"Even though it was advanced in its execution, we rethought the way we worked, we learned from technologies being applied elsewhere and we made material improvements on costs," said Harry Brekelmans, projects and technology director for Shell. "Of course, we benefited from the tailwind created by the changes in the market by the deflation that took place, but we also made significant improvements in drilling performance. Initially, it took 150 days to drill a typical well, but now we can get the job done in approximately 60 days."

When it came to Appomattox, Shell had more freedom. The Appomattox development will initially produce from the Appomattox and Vicksburg fields, with first oil by the end of the decade and average peak production estimated to reach about 175,000 boe/d. With the recent completion and arrival of the hull in Texas, and construction of the host platform and fabrication of subsea infrastructure currently underway, Shell's Appomattox project is more than 65% complete.

It reduced the capital costs of the project by about 25% after the final investment decision. This was after already having achieved 20% cost reductions against initial concepts. "We did this through innovation, competitive scoping and efficient execution," Brekelmans added. "The platform cost, for instance, was cut by one-fifth by using what we had learned and replicated from previous similar



Harry Brekelmans

projects. In this case, it was the neighboring Olympus tension-leg platform that we particularly learned from. We pushed for further savings by standardizing equipment and wells. This is how we cut costs, [without] compromising safety, quality or reliability."

Next in line was Kaikias, a high-value opportunity in deep water near existing

Shell infrastructure in the GoM heartland. Kaikias builds upon Shell's exploration and development leadership position in the Mars-Ursa Basin. As it moved to develop Kaikias, Shell's capital efficiency approach had an even greater effect. With its competitive scoping and efficient execution, it transformed how it interacted with its supply chain.

"The transformation emphasizes the importance of partnership and collaboration with contractors," Brekelmans said. "We simplified the design of new wells and subsea facilities, we adapted existing wells and we applied lessons learned from earlier work with subsea tieback projects as well as innovative design features."

The result was a 50% reduction in costs compared to initial estimates.

### Reaping The Rewards

The final project is one on which Shell has yet to make a final investment decision, Vito. "It is a project where we went back to the drawing board in 2015 and configured it again," Brekelmans said. "It has collaboration and replication at its core, but it also draws on technological innovation. It draws on the impressive improvements in performance that we have been able to develop and sustain in drilling and construction over the past three years.

"Vito is a potential new hub in the Gulf and it would never have got close to a final investment decision without this differentiating approach."

In this case, the work Shell undertook meant a cost reduction of 70% against initial estimates for the wells and the subsea and topside facilities. Innovations on Vito include the use of more compact equipment and standardized structural design.

Brekelmans explained that while it is essential that Shell improves the capital efficiency of all its investments, it must drive operational excellence to be truly competitive. "This means increasing safety, improving reliability, productivity and efficiency in the way we do maintenance,

in our logistics, in production operations, in everything we do," he said.

The company challenged existing practices, removed unnecessary materials and equipment and rationalized stocking and logistics, Brekelmans said. He added, "This meant that we not only increased productivity but achieved overall cost savings of approximately \$500,000 per rig per day.

"We also reduced the number of contract marine vessels by about 75%. It is by buying more ready products that we enable a more agile supply response," he continued. "It is by optimizing our operations and understanding what is truly required, that we can more efficiently design our future projects."

—Mark Venables

## BUSINESS BRIEFS

### TechnipFMC Acquires Stake In Riserless Light Well Intervention Company

TechnipFMC has signed an agreement with the Island Offshore Group to acquire a 51% stake in Island Offshore's wholly owned subsidiary, Island Offshore Subsea AS.

The agreement with TechnipFMC is subject to the satisfaction of certain closing conditions.

Island Offshore Subsea AS provides riserless light well intervention (RLWI) project management and engineering services for plug and abandonment (P&A), riserless coiled tubing (CT) and well completion operations. Island Offshore Subsea AS employs about 80 people.

Island Offshore Subsea AS has developed proprietary designs related to subsea P&A and riserless CT. In connection with the acquisition of the controlling interest, TechnipFMC and Island Offshore will enter a strategic cooperation agreement to deliver RLWI services on a worldwide basis, which also will include TechnipFMC's RLWI capabilities. Island Offshore Subsea AS will be rebranded and become the operating unit for TechnipFMC's RLWI activities worldwide.

Odd Strømsnes, vice president of offshore integrated services at TechnipFMC, will be the managing director of Island Offshore Subsea AS.

### Chevron Names Corporate Vice President Of Strategic Planning

Chevron Corp. has named Bruce Niemeyer corporate vice president of strategic planning. Niemeyer is currently vice president of Chevron's Mid-Continent business unit.

In his new role, Niemeyer will be responsible for setting the strategic direction for the company, allocating capital and other resources and determining operating unit performance measures and targets.

Niemeyer will be succeeded by Jeff Gustavson, currently president of Chevron Canada Ltd. In his current role, Gustavson is responsible for Chevron's upstream interests in Canada, including interests offshore Newfoundland and Labrador, the proposed Kitimat LNG project and assets in the Northwest Territories and Yukon Territory.

Gustavson joined Chevron in 1999 and has held positions in finance, mergers and acquisitions, corporate strategic planning, supply and trading, investor relations and upstream, with numerous assignments in the U.S. as well as Venezuela, the U.K. and Canada.

### Aker Solutions Q4 Beats Forecast, Vows Further Cost Cuts

Engineering firm Aker Solutions reported higher-than-expected fourth-quarter 2017 earnings on Feb. 6 and said it would continue to cut costs in the next several years despite a pickup in demand.

The Norwegian company has completed a two-year program, boosting its efficiency by some 30% from 2015, and now plans at least 20% further improvement by 2021, compared with the 2015 benchmark.

Core operating profits, excluding special items, fell by 11% year-on-year to \$61.69 million for the October-December quarter, above analysts' average forecast of about \$53.76 million in a Reuters poll.

"Aker Solutions sees overall revenue somewhat up in 2018 from 2017, helped by the recent new orders and improving activity in the maintenance and modifications markets," the company said in a statement.

The company's underlying earnings margin before interest, tax, depreciation and amortization for 2018 was seen remaining around full-year 2017 levels, it added.

Separately, the firm said it is entering the offshore floating wind sector by buying a 5% stake in Principle Power Inc., a company that makes foundations for turbines irrespective of water depths. The company will raise this to a 10% stake by year-end 2018. The value of this deal was not disclosed.

### Kosmos Energy Refinances \$1.3 Billion Term Loan

Kosmos Energy Ltd. said it refinanced the loan facility tied to its energy reserves, raising the borrowing capacity to fund exploration.

Borrowing capacity has been increased from \$1.3 billion to \$1.5 billion, the Dallas-based company said.

The reserve-based lending facility, which previously incorporated only the Ghana assets, now includes the recently acquired producing assets in Equatorial Guinea, Kosmos said.

### Aker BP Q4 Core Profit Lags Market Expectations

Aker BP reported a 5% rise in fourth-quarter core profit Feb. 2, lagging market expectations.

EBITDA rose from \$485 million to \$509 million a year earlier and fell short of the \$528 million expected by analysts.

The independent oil company, 30% owned by BP, also missed expectations for net profit, which came at \$34 million for the period, up from a net loss of \$67 million a year earlier.

The company said it would pay a quarterly dividend of \$0.3124 per share in February, representing a total dividend of \$450 million for full-year 2018.

### **Cosasco, Sensorlink Form Exclusive Partnership**

Corrosion and erosion monitoring specialist Cosasco has signed an exclusive partnership with Sensorlink, which manufactures and supplies high-resolution, nonintrusive corrosion and erosion monitoring technologies.

Under the agreement Cosasco said it will have unique access to market, sell and distribute Sensorlink's PipeMonit SWARM technology worldwide. The agreement also gives Sensorlink an opportunity to widen its market reach for nonintrusive monitoring solutions in the topside market through Cosasco.

As described in a news release, "PipeMonit SWARM is a fixed-point, online, nonintrusive ultrasonic monitoring solution that provides precise, reliable and repeatable pipe wall thickness measurements in real time.

### **BP Profits Surge As Oil Major Leaves Downturn Behind**

BP's profits more than doubled in 2017 to \$6.2 billion powered by higher prices and output of oil and gas, allowing the company to resume share buybacks as it recovers from a three-year downturn.

The London-listed company saw one of the strongest output increases in its history last year, lifting production to levels not seen since the 2010 Deepwater Horizon oil spill.

Production is set to continue growing into the end of the decade thanks to more field startups this year.

BP will generate profits in 2018 at an oil price of \$50/bbl, CFO Brian Gilvary of BP told Reuters, as years of spending cuts kick in and as the company slowly shakes off a \$65 billion bill for penalties and cleanup costs from the 2010 spill.

BP was the first among its European peers to resume share buybacks in fourth-quarter 2017 after years of dilutive austerity measures in the face of the industry slump. With a 20% bounce in oil prices in the last quarter of 2017 to \$6/bbl, BP had a surplus of cash that allowed it to buy \$343 million worth of shares in the fourth quarter, offsetting the scrip dilution.

Full-year production rose 12% to 2.47 MMbbl/d after BP launched seven new oil and gas fields in 2017, a record year. It is set to start up six additional projects this year, including in Egypt, Azerbaijan and Britain's North Sea, helping boost production by 900,000 boe/d by 2021, mostly gas. BP previously said it would launch five new projects this year.

It added about 1 Bboe to its reserves in 2017, the largest since 2004, thanks to six discoveries, including in Senegal and the North Sea. Its reserve replacement ratio was estimated at 143% for the year.

### **ExxonMobil Names MetLife CEO Kandarian To Its Board**

ExxonMobil Corp. named MetLife Inc. CEO Steven A. Kandarian to its board of directors.

The company cited Kandarian's financial and risk management experience as a reason for adding him to the board, which will now have 11 members.

ExxonMobil does not hedge its oil production but does have insurance and other financial protections for part of its operations.

ExxonMobil's move came the same day Chevron Corp. named Caterpillar Inc. CEO Jim Umpleby to its own board.

### **Shell Agrees To Sell Stake In Thailand's Bongkot Field To PTTEP**

An affiliate of Royal Dutch Shell has divested 22.2222% interest in the Bongkot Field and adjoining acreage offshore Thailand to PTT Exploration & Production Public Co. Ltd. (PTTEP) for a transaction value of \$750 million.

The transaction is expected to complete in the second-quarter of 2018, subject to completion conditions as prescribed in the agreement.

The agreement is for Shell's stake in Blocks 15, 16 and 17 and Block G12/48. Following the completion of this transaction, PTTEP's stake in Bongkot will increase to 66.6667%, with the remaining 33.3333% owned by Total SA. PTTEP is the current operator of Bongkot.

Shell's decision to divest remains is driven by its strategy to sell noncore assets to reshape Shell into a simpler, more resilient and focused company. This sale takes Shell a step closer to its divestment target of \$30 billion. Shell said the divestiture has no impact on its other business interests in Thailand.

### **Statoil Quits Talks Over Stake In Mozambique Offshore Gas Block**

Statoil said it has pulled out of negotiations to take a 25.5% stake in a gas block off Mozambique, citing a lack of progress after more than two years of talks.

Statoil, Eni, South Africa's Sasol and Mozambique's national oil and gas company ENH were awarded the exploration rights in the A5-A Block within Mozambique's Northern Zambesi Basin in 2015.

"Statoil has decided to disengage from negotiations on Block A5-A in Mozambique. ... We are not part of this anymore; it is up to the other partners to make any moves regarding the stake," Statoil spokesman Erik Haaland told Reuters.

The lack of progress in the negotiations and an unfavorable business environment prompted Statoil's decision, Haaland said.

The future of the joint venture after Statoil's withdrawal lies with the remaining partners, he added. "If they want to continue, there are mechanisms in the bidding process allowing them to do so."

The block, which covers a total area of 5,145 sq km (1,987 sq miles), was seen as having "significant hydrocarbon resources," Eni said in 2015.

After quitting its bid for A5-A, Statoil has no further assets in Mozambique, which is in the throes of a debt crisis but has large untapped natural gas reserves.

### **Noble Energy To Sell Part Of Stake In Tamar Gas Field**

Noble Energy Inc. will sell a 7.5% stake in the Tamar natural gas field offshore Israel to Tamar Petroleum Ltd. for about \$800 million in cash and shares, the Houston-based oil and gas producer said Jan. 29.

Noble will receive \$560 million in cash and 38.5 million shares of Tamar Petroleum.

The deal allows Noble to cut its holdings in Israel's only commercial gas field from 32.5% to 25%, complying with government plans to open the market to competition.

The assets being sold produced about 1.7 MMcm/d (62 MMcfe/d) of natural gas in 2017, Noble said.

The deal follows an initial sale by Noble of 3.5% of the Tamar Field in mid-2016. Combined proceeds from both deals amount to nearly \$1.25 billion, of which almost \$1 billion will be in cash.

### **Blackstone To Invest In Norwegian Oil Startup Mime Petroleum**

Private-equity firms Blackstone and Blue Water Energy LLP will together invest up to \$1 billion in Norwegian oil startup Mime Petroleum, the companies said on Feb. 1.

Founded in 2017, Oslo-based Mime will focus on buying stakes in oil fields offshore Norway to drive value via production optimization, new developments and near-field exploration.

Blackstone declined to say how big its individual investment would be.

A number of private-equity firms, including HitecVision and Kerogen Capital, have bought assets on the Norwegian Continental Shelf in recent years as oil majors and European energy companies sought to divest.

### **Shell's 2017 Profits More Than Double**

Royal Dutch Shell's profit more than doubled in fourth-quarter 2017 to \$4.3 billion, slightly ahead of forecasts, supported by higher oil and gas prices and production, the company said.

Net income attributable to shareholders, based on a current cost of supplies and excluding identified items, rose 140% from \$1.795 billion.

A company-provided analysts' consensus forecast was \$4.24 billion.

The Anglo-Dutch company took a \$2 billion charge in the quarter due to the new U.S. tax regime, it said.

On an annual basis, Shell's profits more than doubled from \$7.185 billion to \$15.76 billion.

### **J2 Subsea Names Christian Blinkenberg General Manager**

J2 Subsea, an Acteon company, has appointed Christian Blinkenberg as general manager based in Aberdeen.

Blinkenberg has more than 15 years of experience in the oil and gas sector, having worked in the U.K., Brazil, the U.S. and Nordic regions, the company said in a news release.

Formed in 2008, J2 Subsea provides ROV tooling products and services for the ROV and underwater survey markets.

### **Xodus Takes On Study To Benchmark Scottish Subsea Capabilities**

Working on behalf of Scottish Enterprise, Xodus Group is undertaking an international study to determine competitiveness and innovation in the Scottish subsea market and benchmark capabilities with regions across the world, a news release stated.

The group aims to shape projects and activities in support of Scottish Enterprise's Subsea Engineering Action Plan.

"Following initial analysis of Scotland's competitive advantages, Xodus will conduct a comparison of key international subsea hubs. This will include an examination of each region's capabilities, such as company bases, supportive policies, research funding, institutes and the industry bodies available for developing these strengths," according to the release.

Subsea specialists with Xodus will work with a global database of contacts, focusing on eight focus areas. These include project lifecycle, key individual technologies, subsea processing and specific non-O&G industries, the release stated.

"The results of this study will allow us to identify where Scottish subsea companies can deploy their skills and support our plans for delivering a wide range of projects to ensure our companies are well placed to take advantage of new opportunities going forward," said Andrew Wylie, operations director for Scotland and Norway at Xodus Group.

He added that Scotland accounts for 14% of the world's subsea market.

### **National Oilwell Varco Equipment Orders Rise, Loss Narrows**

National Oilwell Varco said on Feb. 6 that its oilfield equipment orders rose to their highest in over two years last quarter as rising crude prices spurred U.S. drilling activity, helping to narrow the company's loss for the period.

Oilfield suppliers are continuing to recover slowly from a brutal three-year downturn as U.S. crude prices climb above \$60 a barrel, stirring demand for their oilfield equipment and services.

The Houston-based company reported its loss fell to \$14 million in the quarter, from \$714 million a year earlier, on a 16% bump in revenue to \$1.97 billion. Orders for completions and productions hit \$501 million in the fourth quarter, compared with \$370 million a year earlier. Within its rig division, new orders were \$169 million versus \$115 million a year ago.

"It feels to us that the market is nearing an inflection point," CEO Clay Williams said on a conference call. National Oilwell Varco plans its first "meaningful" bonus compensation in three years, executives said on



the call, a move expected to lower its free cash flow in the current quarter.

Rig technologies revenues rose to \$614 million, up 20% from the prior quarter, and \$1 million higher than the year-ago period.

Promises of capital discipline among oil producers and less bank financing for new projects may temper future production increases, resulting in “higher oil prices down the road,” Williams said.

The company remained cautious on the near-term prospects for an offshore equipment and services recovery, noting that producers remain focused on onshore activities, which require lower crude prices to turn a profit.

Baker Hughes, a GE company, last week said the subsea market remained challenging for its oilfield equipment business, and that it expected muted activity in the offshore sector in the short term.

—Staff & Reuters Reports

## IN MEMORIAM

### Offshore Pipeline Engineering Pioneer Bob Brown Passes Away

R. J. (Bob) Brown, possibly the pre-eminent offshore pipeline engineer of the last 40 years, died in late January just weeks short of his 90<sup>th</sup> birthday.

Brown had a distinguished oil industry career of nearly 70 years, landing his first job in 1950, but made his mark in the offshore sector after founding RJ Brown & Associates in 1969.

He was involved in the design and fabrication of one of the earliest offshore semisubmersible lay barges (*Viking Piper*, later *Castoro 7*) used in the North Sea and other environmentally hazardous waters. The barges were the first to employ double-jointing of pipeline strings. He was responsible for the design and installation of towed bundled pipelines in the Gulf of Mexico (GoM), and he designed a number of early pipeline ploughs.

In his latter days, Brown was involved in deepwater pipeline installation, mostly in the GoM. In addition, he was a pioneer in early Arctic pipeline design.

Brown was also responsible for bringing into the sector an entire generation of offshore pipeline engineers

who went to form their own companies, including Andrew Palmer & Associates and INTEC, the former now part of Penspen and the latter, now INTECSEA, a division of Worley Parsons. Like a number of other engineer-entrepreneurs who emerged from the GoM in the 1970s, Brown sold and later bought back his company several times. In the early 1980s, it was called Kvaerner RJ Brown, while its current incarnation (since 2000) is RJ Brown Deepwater, part of the TechnipFMC conglomerate.

Brown held a bachelor's degree in civil engineering from Ohio University and a Master of Science in civil engineering from Stanford.

If Brown was not talking about or working on pipelines, he was flying his single engine plane until his age prevented him from doing so.

Brown was inducted into the Hall of Fame of Houston's Offshore Energy Center in 2008.

—Steve Sasanow

## UPCOMING

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

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