

Subsea Sector Awaits Better Days Ahead

Still rebounding from a crippling market downturn marked by activity slowdowns offshore, the subsea industry is looking forward to better days ahead with market opportunities on the horizon.

Analysts say the sector remains challenged.

“Those looking for signs of improvement in offshore development didn’t exactly find much comfort in subsea results this quarter,” Barclays analysts said in a note. “Though it’s pretty clear 2019 will be the earnings trough for subsea, the step down in 4Q18 points to more challenges ahead before it gets better.”

The outlook comes as oilfield service companies and their clients deliver third-quarter earnings reports and shed light on what the future could hold. Rising commodity prices, demand and greater efficiency with improved economics have given oil and gas companies enough confidence to push forward with projects offshore as they compete with projects onshore.

But the recovery process has been a slow but steady one for subsea.

“In subsea we are clearly in a period of recovery that began nearly two years ago in 2017,” TechnipFMC CEO Doug Pferdehirt said on the company’s latest earnings call. “We saw our subsea order inbound increase 27% year-over-year, and we continue to expect 2018 inbound to exceed that of 2017.”

TechnipFMC reported \$3.1 billion in revenue for the third quarter, down from about \$4.1 billion a year earlier. But net income grew to \$136.9 million, up from \$121 million.



A TechnipFMC ROV is deployed to provide subsea services. (Source: TechnipFMC)

The company’s subsea segment saw its revenue fall 18.2% to \$1.2 billion as projects offshore Africa, Europe and the Asia-Pacific regions neared completion.

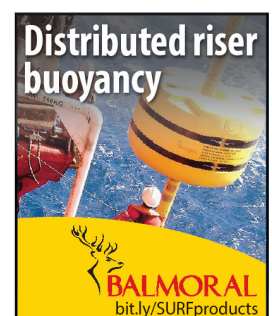
Subsea operating profit fell by just over 22% to \$79.7 million. This was “primarily due to the anticipated revenue decline and more competitively priced backlog, offset in part by merger synergies and other cost reduction activities,” the company said. “The timing of completion of certain projects continued to benefit margins in the period, although the impact was less pronounced than in the prior-year quarter.”

But the company called the outlook for its three growth pillars, including subsea, favorable.

Subsea inbound orders jumped 58.6% to about \$1.6 billion, while the backlog rose 6.6% to about \$6.3 billion.

WHAT'S INSIDE

Woodside Aims To Sign Off On Browse Gas Project In 2020.....	3
Equinor Finds More Oil Near Arctic Johan Castberg Field	5
CEOs Have Appetite For New Technology	7
Three Companies Upgrade ROV Fleets	8



Pferdehirt pointed to the iEPCI for Energean's Karish development, subsea umbilicals, risers and flowlines work for Chevron Gorgon Stage 2, and a subsea production system for Exxon Mobil's Liza Phase 2 project as contributors to the company's improved visibility.

"Favorable book-to-bill trends also lend support to growth in backlog. Year-to-date trends and final investment decisions, or FIDs, for large offshore projects have been positive," Pferdehirt said. "Although FIDs have been tracking fairly in line with oil prices, it's encouraging that the number of FIDs related to larger projects has returned to levels last seen when oil was above \$100 a barrel."

The company has identified several subsea opportunities over the next 24 months. The list includes six with projects valued at between \$250 million and \$500 million, 11 valued at between \$500 million and \$1 billion, and three valued at more than \$1 billion. The latter includes Royal Dutch Shell's Bonga Southwest deepwater project offshore Nigeria, Eni's Zabazaba offshore Nigeria and Anadarko's Golfinho offshore Mozambique.

Add to these the pipeline of opportunities valued at less than \$250 million, including subsea tiebacks and smaller brownfield projects. Pferdehirt said the market for such projects "remains quite large."

"This recovery from the 2015 trough is supported by the considerable improvement in both deepwater project economics and operators' cash flow," Pferdehirt added. "Our confidence is further underpinned by an approximate 90% increase in FEED studies year to date, with over 50% of these new studies focused on integrated projects. More importantly many of these FEED studies now also incorporate our next-generation subsea technology—Subsea 2.0."

Subsea 2.0, which was released about a year ago, features 50% fewer parts and a smaller, modular design that uses standardized components.

Barclays analysts called TechnipFMC's third-quarter results "solid," singling out strong project execution, bonus payments and decent orders.

"Of course, it's really the orders that matter for capital equipment," Barclays said, referring to the subsea sector, "and although book/bill has been largely above 1.0x over the past [approximately] 3-4 quarters, orders once again were generally flat this quarter and outside of FTI's [TechnipFMC] large Liza Phase 2 award, few awards were noteworthy."

The subsea segment showed marked improvement for Oceaneering, although the company reported a net loss of \$66 million on revenue of \$519 million for the quarter.

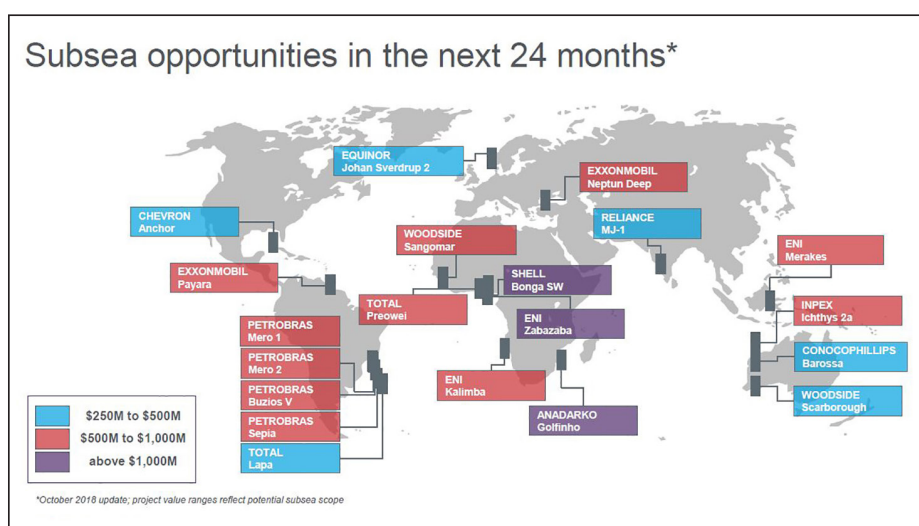
"Compared to our adjusted second-quarter 2018 results, operating results for the third quarter improved by \$10.4 million, mainly due to favorable profit contributions from subsea projects and subsea products, and lower unallocated expenses, partially offset by lower profitability in our remotely operated vehicle segment," Oceaneering CEO Roderick A. Larson said in a news release.

Subsea products operating income increased by 13% as backlog grew to \$333 million, up from \$245 million in the second quarter. Subsea project's operating income grew by 35%, bringing in \$6.1 million, "driven by higher levels of seasonal utilization and pricing in the U.S. Gulf of Mexico deepwater vessel and diving services, and an increase in survey services," the company said.

However, seasonality and less activity offshore are expected to bring down earnings in the fourth quarter—mostly from the subsea products and subsea projects segments, Larson said.

Longer term, his outlook appeared more optimistic.

"We are encouraged that the long-term fundamen-



(Source: TechnipFMC)

tals for the offshore energy industry have stabilized, and we believe we are now in the early stages of a recovery in activity in general and in our businesses. We expect a recovery will take time, and only after a sustained higher level of activity can prices for our services and products be increased enough to generate satisfactory returns," Larson said in the release.

"Accordingly, looking into 2019, we are projecting increased activity levels in each of our segments, likely led by revenue gains in our Subsea Products manufacturing business unit," he added. "However, the pace of recovery is still difficult to determine, and at this time we are not prepared to offer more detailed guidance on 2019."

The earnings season continues with more companies scheduled to release reports in November. These include Subsea 7, which is set to unveil third-quarter results Nov. 8.

—Velda Addison

DEVELOPMENT

Woodside Aims To Sign Off On Browse Gas Project In 2020

Woodside Petroleum Ltd. on Oct. 18 said it was aiming to bring forward the target date for approving the mammoth Browse gas project off northwest Australia by a year to 2020, with the \$15 billion cost estimate potentially being pared.

Woodside, operator and top stakeholder in Browse, expects the earlier final investment decision thanks to recent progress on technical contracts and commercial agreements for processing gas from the project, Woodside CFO Sherry Duhe said.

“It is something that technically we’re quite confident about at this point. And the progress that we’re making, in particular on getting very imminently to sign the preliminary agreements, is also supporting that as well,” Duhe told Reuters.

Woodside is driving Browse and the \$11 billion Scarborough project, also off northwestern Australia, looking to capitalize on an LNG supply gap expected to open up in the early 2020s.

“It’s really about us having the confidence to proceed and knowing that the market is there,” Duhe said in an interview after the company released its quarterly production report.

Browse, the biggest undeveloped gas resource off northwestern Australia, has been stuck on the drawing board for years as plans for onshore and floating LNG developments estimated at up to \$45 billion were scrapped.

The development cost has been slashed as Browse will now feed the existing North West Shelf LNG plant, rather than requiring a new plant to be built. And contractors have indicated there might be opportunities to trim the estimated \$15 billion cost of the project, Duhe said.

Royal Dutch Shell, BP and PetroChina, along with Japan’s Mitsubishi Corp. and Mitsui & Co., are Woodside’s partners in Browse.

“BP supports developing the Browse resources as soon as possible and is working hard with its JV [joint venture] partners to achieve that,” a BP spokeswoman said.

However, a Mitsui spokesman said the JV had yet to agree on a 2020 target for a final decision.

Shell deferred to Woodside for comment, while Mitsubishi and PetroChina declined to comment.

—Reuters

DEVELOPMENT BRIEFS

Petrobras Fires Up New Lula Oil Platform Offshore Brazil

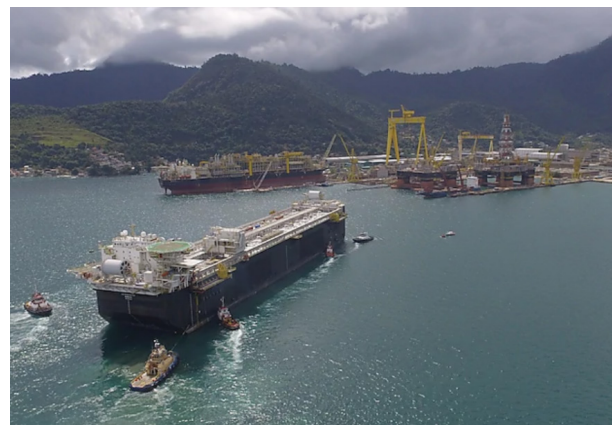
Petrobras said on Oct. 24 it had started production on its eighth platform in the offshore Lula Field, Brazil’s most productive, as it ramps up output from the Santos Basin in the coveted presalt oil play.

Operated by Petrobras, the FPSO *P-69* is a standardized production vessel offshore Brazil with a capacity for 150,000 bbl/d of oil and 170 Mcm/d (6 MMcf/d) of natural gas. The FPSO features eight production wells and seven injection wells to extract oil and gas from the field, which was discovered in 2006 and where production began four years later.

Petrobras operates the field and owns a 65% stake. Royal Dutch Shell Plc and Galp have 25% and 10% stakes respectively.

In the presalt offshore area, billions of barrels of oil are trapped beneath a thick layer of salt under the ocean floor. The Santos Basin already accounts for more than half of production in Brazil.

A Shell executive told Reuters last month that Lula should hit peak production in 2020 or 2021, after reaching 1 MMbbl/d of oil and gas next year.



Petrobras has started production on its eighth platform in the Lula Field. (Source: Petrobras)

HARTENERGY **MERITORIOUS Engineering Awards**
 Now Accepting Your 2019 Engineering Technology Award Entries
 Submit to: Meaentry.com

Aker Wins Subsea Order For Lingshui Field Development In China

Aker Solutions said Oct. 23 it has received a notification of award for orders valued at more than \$204 million from the China National Offshore Oil Corp. (CNOOC) to provide the subsea production system and umbilicals for the Lingshui 17-2 gas field.

Lingshui 17-2 is CNOOC's first subsea deepwater project developed by the company with water depths of up to about 1,500 m (4,921 ft). The field is located in the South China Sea off the Hainan Province.

The subsea production system for the Lingshui 17-2 Field consists of 11 horizontal subsea trees, four manifolds, topside and subsea control system, and a vertical tie-in connection system. The work scope also includes more than 70 km (43 miles) of static and dynamic umbilicals, linking the subsea development to a new, semisubmersible platform.

The subsea manifold will be manufactured and tested locally by China Offshore Oil Engineering Co. (COOEC). The services for installation and commissioning will also be executed in China.

The global project will involve Aker Solutions' facilities in Malaysia, Norway and the U.K. The delivery for the subsea production system and umbilicals will be from the second half of 2019 to 2020. The order will be booked in fourth-quarter 2018.

TechnipFMC Snags Contract For Exxon Mobil's Liza Phase 2 Project

TechnipFMC has been awarded a contract by an affiliate of Exxon Mobil Corp. for the engineering of the subsea system for the proposed Liza Phase 2 project, the company said Oct. 23.

Following engineering and subject to requisite government approvals, project sanction and an authorization to proceed with the next phase, TechnipFMC will then manufacture and deliver the sub-

sea equipment. Delivery would include 30 enhanced vertical deepwater trees and associated tooling as well as eight manifolds and associated controls and tie-in equipment.

In support of this project, TechnipFMC will continue hiring and training Guyanese engineers.

The Liza Phase 2 development is located approximately 193 km (120 miles) offshore Guyana on the Stabroek Block with water depths of 1,500 m (4,900 ft) to 1,900 m (6,200 ft). Exxon Mobil affiliate Esso Exploration and Production Guyana Ltd. is the operator.

UK Green Lights Zennor's Finlaggan Development Plan

The Oil and Gas Authority has approved Zennor Petroleum Ltd.'s plans for the Finlaggan Field in the U.K. Central North Sea, according to a news release.

Zennor aims to recover 26 MMboe of gas condensate reserves from the field located in Block 21/05C. Plans call for two subsea production wells tied back 20 km (12 miles) to the Britannia platform operated by ConocoPhillips. Zennor said the first of two development wells has already been drilled by Transocean's Paul B. Loyd Jr. drilling rig and is cased, cemented and ready for completion and cleanup.

TechnipFMC landed the contract to install the main installation, which includes laying 10-in. pipe-in-pipe production flowline and electrohydraulic control umbilical back to Britannia, in 2019.


First production is expected in fourth-quarter 2020.

BP Receives OGA Approval To Develop Alligin Field In North Sea

BP on Oct. 22 confirmed it has received approval from the Oil and Gas Authority (OGA) to proceed with the Alligin development west of Shetland, which will target 20 MMboe and is expected to produce 12,000 boe/d gross at peak.

Tubular Bells
First Oil
November
2014





Lucius First Oil
January 2015



Jack/St. Malo
First Oil
December
2014



Three Successful Startups, One Common Denominator

Leader in Topsides Design

Alligin is located 140 km (87 miles) west of Shetland in a water depth of 475 m (1,558 ft). It forms part of the Greater Schiehallion Area.

The Alligin development will consist of two wells, which will be tied back to the existing Schiehallion and Loyal subsea infrastructure, utilizing the processing and export facilities of the *Glen Lyon* FPSO vessel. It is expected to come onstream in 2020.

The development will include new subsea infrastructure, consisting of gas lift and water injection pipeline systems, and a new controls umbilical. The wells will be drilled by the Deepsea Aberdeen rig. Alligin (BP 50% operator; Shell 50%) is part of a series of infrastructure-led subsea tieback developments in the North Sea.

Premier Oil, Dril-Quip Enter Deal For Sea Lion Project

Dril-Quip Inc. said that its wholly owned subsidiary, Dril-Quip (Europe) Ltd., has entered a FEED contract and frame agreement with Premier Oil Exploration and Production Ltd. to provide the subsea production systems for the Sea Lion Phase 1 development located offshore the Falkland Islands.

The frame agreement replaces the previously announced letter of intent.

The current estimated value of the equipment portion of the scope of work is \$207 million, which includes plans for up to 30 subsea production systems, including wellheads, horizontal trees, tubing hangers, control systems, associated production and injection manifolds, and subsea umbilicals.

Under the frame agreement, it is envisaged that Dril-Quip will provide vendor financing for up to 30% of the equipment portion of the contract. A formal contract award will be subject to agreement of a definitive contract and Premier taking a final investment decision.

WorleyParsons To Handle Modification Work On Edvard Grieg

Lundin Norway and its license partners in production license 338 have awarded Stavanger-based Rosenberg WorleyParsons a contract for modification work on the Edvard Grieg platform in the North Sea, a news release said.

The objective of the modification is to prepare the platform to receive and process oil and gas from nearby fields. Luno II and Rolvsnes will be the first discoveries to be tied in to Edvard Grieg.

This contract comprises engineering services, purchasing and construction work offshore. Rosenberg WorleyParsons will start engineering related to prefabrication of steel structures, pipelines and other necessary material immediately, while the installation work offshore will start in first-half 2019. The work is expected to be completed in first-quarter 2021.

With the modifications, the platform will be able to handle the satellite fields Luno II and Rolvsnes, both operated by Lundin Norway. Also, preparations for additional satellite fields will be made.

Luno II is located 19 km (11 miles) south of Edvard Grieg, and the plan is to develop the field as a subsea installation with a pipeline back to Edvard Grieg. The goal is to submit the plan for development and operation for Luno II in early 2019.

The initial plan for Rolvsnes is to conduct a long-term well test where oil and gas is processed on Edvard Grieg. The Rolvsnes discovery was made in a reservoir consisting of fractured and weathered basement rocks. This is a new type of reservoir for the Norwegian shelf, and more knowledge is needed to select an efficient development solution.

Aker BP To Buy Equinor Gas, Condensate Discovery

Aker BP has agreed to buy Equinor's 77.8% stake in Norway's King Lear gas and condensate discovery for \$250 million in cash, the two companies said in October.

The North Sea discovery has estimated reserves of 77 MMboe, and by connecting it to existing production facilities at the Ula Field, Aker BP expects the acquisition to add more than 100 MMbbl in total.

"This [tie-in] will improve the capacity utilization at the Ula facilities and provide significant additional volumes of injection gas to support increased oil recovery," the company said.

Equinor said the stake sale was part of a process to streamline its Norwegian portfolio.

"By doing so we unlock capital for investment in projects that offer higher returns for Equinor," said Jez Averty, Equinor's senior vice president for operations in the southern North Sea.

The remaining 22.2% stake in King Lear is held by Total. The transaction is subject to approval by Norwegian authorities.

—Staff & Reuters Reports

EXPLORATION BRIEFS

Equinor Finds More Oil Near Arctic Johan Castberg Field

Norwegian oil and gas firm Equinor has found more oil near its Johan Castberg Field in the Arctic Barents Sea, the company said Oct. 29.

The Skruis exploration well, drilled about 8 km (5 miles) north of the original discovery, indicated a volume of between 12 MMbbl and 25 MMbbl of recoverable oil.

"The Skruis discovery confirms the potential in this part of the Barents Sea ... The partners will now fur-

ther consider tie-in of the discovery to Johan Castberg,” Equinor said.

The Castberg Field, estimated to hold between 450 MMbbl and 650 MMbbl of oil, excluding Skruis, is expected to start in 2022.

The time frame for developing Skruis would depend on the availability of spare capacity at Johan Castberg production facilities, which are likely to be fully utilized until 2026–2027, the company added.

Equinor, the operator, holds a 50% stake in the Johan Castberg license, while Eni has 30% and Norway’s state-owned Petoro has the remaining 20%.

Equinor plans to drill three wells in the Barents Sea this year and to participate as a partner in a fourth.

Eni, Total, Sonatrach Partner For Exploration Offshore Algeria

Eni, Sonatrach and Total have signed two agreements, which include an exclusive partnership for offshore exploration in Algeria in a geological province that has seen little exploration, Eni said in a news release.

“Together with Sonatrach and Total, we will have the opportunity to explore the deep waters of the Algerian offshore, a virtually unexplored geological province where Eni will be able to contribute by leveraging its experience in the Eastern Mediterranean and its inventory of advanced exploration technologies,” Eni CEO Claudio Descalzi said in the release.

The agreements were signed Oct. 29 during the Algeria Future Energy Summit.

Eni and Total will also pursue obtaining exploration permits, which will allow for the rapid completion of the hydrocarbon potential assessment, the release said.

Wellesley Successfully Appraises Grosbeak Discovery In North Sea

Wellesley Petroleum AS on Oct. 29 announced the successful appraisal of the Grosbeak discovery in the Northern North Sea by wells 35/11-21S and 35/11-21A. The wells were drilled in production license 248I, where Wellesley holds a 60% operated interest.

Well 35/11-21S encountered a gross oil column of 90 m (295 ft) at the target Middle Jurassic Brent Group level. Within this oil column are 45 m (148 ft) comprised net reservoir with good to excellent reservoir properties. Extensive data were acquired from the reservoir interval including a successful well test, which confirmed the high quality and good connectivity of the reservoir.

Sidetrack well 35/11-21A encountered 20 m (66 ft) of excellent quality gas-bearing reservoir and an 8-m (26-ft) oil column in the shallower Upper Jurassic Sognefjord and Fensfjord formations.

The underlying Brent Group reservoir comprised a 50-m (164-ft) oil column in the Ness Formation with 9 m (30 ft) of sandstones lying within the oil zone. Pressure

data from these sandstones indicate good connectivity to the zone tested in the 35/11-21S well.

The updated range of recoverable resources in the Grosbeak discovery is between 53 MMbbl and 115 MMbbl of oil plus between 7.6 Bcm (269 Bcf) and 12.2 Bcm (432 Bcf) of gas. The 35/11-21S and A wells have been plugged and abandoned and development studies will commence.

“Our predrill subsurface studies of Grosbeak indicated that the Brent Group sandstones were both predictable and well connected and this has been demonstrated by the appraisal wells, significantly reducing the development risk of this reservoir,” said Wellesley Group CEO Chris Elliott. “The discovery of a separate, excellent quality gas reservoir in the Upper Jurassic also adds significant resources to what we expect to be a material and commercially robust future development.”

TGS, Schlumberger Partner For Seismic Project In GoM

TGS and Schlumberger have teamed up for a new multicient nodal seismic project in the U.S. Gulf of Mexico (GoM), according to a news release.

Called Amendment, the project will comprise acquisition of a 2,350-sq-km (907-sq-mile) multicient seismic survey in the Mississippi Canyon and Atwater Valley protraction areas of the GoM. In the news release, Schlumberger said the area includes open acreage, existing producing assets and new discoveries.

“E&P companies are showing increased interest in the benefits of nodal seismic data to overcome imaging challenges in this region,” TGS CEO Kristian Johansen said in the release. “In the Amendment project, TGS and Schlumberger will reimage underlying WAZ [wide azimuth] seismic data to provide modern, high-quality nodal seismic data to our clients.”

The companies plan to use Fairfield Geotechnologies 4C nodal acquisition technology to acquire the seismic data, while TGS and Schlumberger will apply their full azimuth processing expertise, the news release said.

“This unique dataset will provide a step change in illuminating complex subsurface structures and help E&P companies to maximize the value of their producing assets and rejuvenate their exploration portfolios,” said Maurice Nessim, president of WesternGeco, Schlumberger. “This highly integrated project will combine well log data, high-quality orthogonal WAZ and new nodal measurements to provide foundations for the first industry-funded regional nodal survey in the deepwater Gulf of Mexico.”

Operations are scheduled to begin in fourth-quarter 2018 with final data delivered to customers in first-quarter 2020, according to the release. The survey is supported by industry prefunding.

—Staff & Reuters Reports

TECHNOLOGY

CEOs Have Appetite For New Technology

In an industry that isn't quick to jump on trends as fast as others, oil and gas CEOs are clear on the potential opportunities new technology brings.

The problem is 59% of CEOs don't believe their company's technology can be an active disruptor right now, according to KPMG's recently released "2018 Oil and Gas CEO Outlook" report. In fact, the report showed that 57% of CEOs said they feel overwhelmed with the long lead times needed to achieve progress with technology.

"There's a lot of optimism about the potential of this technology and there's already progress in piloting and implementing some of the technology, but they're not entirely sure how to embrace and adapt to it, and how exactly it will disrupt their businesses," said Regina Mayor, global sector head of Energy and Natural Resources at KPMG, in an interview with Hart Energy.

Although some CEOs are still on the fence about technology and its impact, 85% of CEOs said they are piloting artificial intelligence (AI) or have already implemented it, and 97% asserted that new tech creates opportunity.

"The industry has been incredibly forward-thinking when it comes to technology in the first place. The fact that we can drill for oil thousands of feet below the sea and then thousands of feet more below that [shows that] those types of achievements are only doable with the technologies that we have today," Mayor said. "So, there is optimism about the potential but a lack of clarity on how exactly to capture all of that potential."

According to the CEOs, 46% indicate acceleration of revenue growth as the biggest long-term benefit of AI. Another 39% see increased agility or point to improved risk management as long-term benefits for their company.

Regardless, Mayor said the level of predictability that technology offers—like in the outcomes of operations—will play a huge role in transcending the industry.

"Technology is disrupting the status quo in the oil and gas industry. AI and robotic solutions can help us create models that will predict behavior or outcomes more accurately, like improving rig safety, dispatching crews faster



KPMG found that oil and gas CEOs have a lot of optimism when it comes to new technology. (Source: Hart Energy)

and identifying systems failures even before they arise," she said.

"So if you could better manage those types of things, you have predictability in outcome, in your actions and in your safety," Mayor added.

Mayor acknowledged the concern regarding the risks robots pose against humans in the workforce, but the report showed 58% of CEOs feel AI and robotics technologies will create more jobs and 93% expect an increase in industrywide head count.

"There is a belief that these technologies decrease the amount of humans that you need to perform certain tasks or run different parts of the business, but we're seeing companies be able to do more with the current head count so we don't see the workers being displaced at all. What we see is that they're not going to hire to get back to pre-oil commodity price levels, but they also won't have to hire as many people to take on more wells and increase production, etc."

Mayor said the goal is not to eliminate humans but actually remove them from the dangerous jobs in the industry while "still maintaining the same level of safety and environmental protection for a better outcome."

"I know that there is some concern about the human element, but I personally believe that we're always going to need lots of humans to run this whole process effectively, and I think the technology is going to improve the quality of work life for the all the employees in the energy industry," she said.

As far as disruption, Mayor said the industry is poised for it but pinpointing how or where it will hit is the hard part. But she is adamant that industry understands the value technology creates.

"It's impressive the array of technological solutions that the industry is experimenting with and quickly adopting like the Internet of Things, the use of drones, 3-D printing, artificial intelligence and even blockchain solutions," Mayor said.

"The activity runs the gamut of all of the potential technology solutions and is finding results from almost all of those experiments. It's an exciting time."

—Mary Holcomb

TECHNOLOGY BRIEFS

Drafinsub Picks Top Falcon For Extensive Operations

Italian underwater works company, Drafinsub, is using the Saab Seaveye Falcon electric robotic vehicle for several complex tasks.



The Falcon is designed for various tasks including diver assistance in shallow and deep water. (Source: Drafinsub)

Work includes pipeline construction, cable laying, offshore platform maintenance and mine clearance.

Drafinsub said it will use the Falcon for various tasks including diver assistance in shallow and deep water, nondestructive ultrasonic testing with an onboard Cygnus, and cathodic protection with an onboard probe and general visual inspections on pipelines and other structures.

The unit is 1 m (3 ft) long and has a depth rated to 300 m (984 ft) and 1,000 m (3,281 ft). Its iCON intelligent control architecture and five powerful thrusters give it the control and power to maneuver with exactitude while loaded with equipment and still hold steady in strong crosscurrents and turbulent water when undertaking precise, complex or robust tasks.

The Falcon's iCON distributed control provides each device on the vehicle with its own microprocessor, allowing tools and sensors to be easily added or changed, and custom options to be integrated—

making it a suitable platform for numerous intricate and demanding applications.

MacArtney Provides Second TRIAXUS ROTV for RV Investigator

MacArtney has supplied a second TRIAXUS ROTV system for use on the Australia's Marine National Facility research vessel, the *RV Investigator*.

This TRIAXUS E version features a higher payload capacity and enables the installation of a wide range of sensors targeted to the specific needs of oceanographic research, the company said in a press release.

The scope of supply from MacArtney includes the TRIAXUS extended E version, the Sea-Bird SBE 911 conductivity, temperature and depth instrument, a transmissometer to determine the excitation of the water medium to gauge clarity at ranging ocean depths, a fluorometer to measure the parameters of chlorophyll a to provide data on concentrations of algae in the water column and a photosynthetically active radiation sensor to determine photon energy available for the photosynthesis processes in the water column.



Custom sensor packages supported by the Nexus fiber-optic multiplexer and man machine interface mean the TRIAXUS can be programmed topside to perform various functions. (Source: MacArtney)

Custom sensor packages supported by the Nexus fiber-optic multiplexer and man machine interface mean the TRIAXUS can be programmed topside to perform various functions and undulations while being towed. Fiber-optic umbilical cabling allows for the feedback of data in real time.

—Staff & Reuters Reports

VESSELS

Three Companies Upgrade ROV Fleets

Three subsea service providers bolstered their capabilities with significant ROV purchases in late October, including two deals for the Saab Seaveye Falcon DR and one for an entire fleet of 28 systems from M2 Subsea.

U.K.-based Rovco bumped its fleet to five with the £200,000 (US\$257,000) purchase of a Falcon intended to support the company's commercial as well as R&D projects. For Genova, Italy-based Drafinsub, an execu-

tive said the decision "was the right time to take a leap in quality."

Scotland-based ROVOP plans to incorporate 19 of the ROV systems into its operations and sell or decommission the rest. The addition will bulk up its fleet to 51 systems—34 hydraulic and 17 electric.

The long-range Falcon DR is rated to 1,000 m (3,281 ft) and is described by its manufacturer as the



The Saab Seaeeye Falcon DR was the choice of Rovco and Drafinsub. (Source: Saab Seaeeye)

most advanced electric underwater robotic system in its class. The purchase, part of the company's ambitious expansion effort, will enable Rovco to expand its ROV and hydrographic survey capabilities. The Falcon is able to perform intricate and demanding missions that require a variety of high bandwidth sensors, either at depth or over long distances.

The Falcon also will carry out research in autonomous path planning by employing Rovco's SubSLAM, live 3-D vision system.

"The addition of the Falcon ROV is the latest in a series of developments within the business and reflects our continued expansion," CEO Brian Allen said in a written statement. "The Falcon is part of a planned £2-3 million investment into our latest technology and will allow us to grow our inspection and R&D capabilities. Alongside commercial use, it will be used to expand our research into autonomous path planning, allowing us to develop our service offering and ensure we continue to be at the forefront of innovative subsea tech."

Drafinsub's work includes pipeline construction, cable laying, offshore platform maintenance and mine clearance. Assignments the company has in mind for its new Falcon include diver assistance in shallow and deep water; nondestructive ultrasonic testing with an onboard Cygnus and cathodic protection with an onboard probe; and general visual inspections on pipelines and other structures.

"We chose the Falcon because it's the industry standard for observation robotic vehicles," said Andrea Dellacasa, Drafinsub's internal caisson tool manager. "It is reliable, scalable and suitable for most kind of works, from observation to nondestructive testing and survey."

"Our company has more than 20 years' experience with ROVs," he continued. "We felt it was the right time to take a leap in quality with the completion of our second diving saturation system."

Drafinsub's diving operations include nine-man saturation units that undertake extensive underwater works offshore, along with dams, nuclear installations and inside tunnels. The company also uses ROVs to place and retrieve bottles of Bisson's Abissi sparkling wine, which is stored underwater in Portofino. The seabed was chosen because of the ideal temperature, darkness, the inability of air to penetrate the bottles and the constant counterpressure that enhances the bubbly nature of the wine. The winemaker, Piero Lugano, also has been quoted as comparing the underwater currents to a crib that gently rocks the bottles and keeps yeast particles moving through the wine.

ROVOP, with operations around the world, purchased the set of 28 ROVs to strengthen its position, particularly in Latin America, Africa, the Middle East and Asia. The company expects the vehicles to be deployed by customers in the vessel and rig markets.

"The addition of these ROV systems to the fleet will enable ROVOP to better support customers with the appropriate ROVs for their requirements based on capability and greater cost efficiency," said CEO Steven Gray. "This increased capacity allows ROVOP to support customers with a wider geographical reach."



ROVOP purchased 28 ROV systems from M2 Subsea. (Source: ROVOP)

VESSEL BRIEFS

ABS Grants AIP To HHI's Standardized FPSO Topside

Hyundai Heavy Industries (HHI) has gained approval in principal (AIP) for its standardized topside design for an FPSO facility.

The milestone was granted by ABS, the global provider of classification and technical advisory services to the marine and offshore industries. While the design was intended for operations in West Africa, HHI maintains that its design can adapt to a range of conditions and can contribute to efforts to cut costs and save time.

"We have worked closely with HHI, using our experience in the sector to support the development of this innovative concept, which has the potential to streamline the project development life cycle," said Luiz Feijo, ABS director of global offshore.

"In the current market, HHI's standardized topside design, requested by our operators, potentially provides more affordable capex with shorter project schedules—and more secure systems reliability and safety with ABS certificates, based on the stringent evaluation process," said Seon Mook Lim, senior vice president, offshore division at HHI. "Further, this newly developed product provides great value, helping to protect profitability from engineering, procurement and construction project risks, and enabling modification to various upstream conditions of West African oil and gas fields with minimal design changes."

Sembcorp Marine, Teekay Offshore Pact On Petrojarl Varg FPSO

Sembcorp Marine Rigs & Floaters landed a contract for engineering, procurement and construction works related to the modification, repair and life extension of the *Petrojarl Varg* FPSO, the company said Oct. 25.

The wholly owned subsidiary of Sembcorp Marine signed the agreement with Varg LLC, a wholly owned subsidiary of Teekay Offshore Partners LP. The contract is estimated at about \$166 million, with work expected to be completed by July 2020.

Sembcorp Marine will be responsible for detailed engineering, fabrication, installation and integration of the topside process skid; overhauling of existing internal turret and power generation; and repair and life extension of the vessel's hull, tanks and various systems onboard.

Alpha Petroleum Resources Ltd. will operate *Petrojarl Varg* at the Cheviot Field development and the Peel satellite accumulation, both within the U.K. Continental Shelf blocks 2/10B, 2/15A and 3/11B in the North Sea.

The agreement remains subject to Alpha Petroleum finalizing debt facilities with a consortium of lenders and the approval by relevant authorities of the company's final field development plan for Cheviot.

—Staff & Reuters Reports

UPCOMING

The next issue of *Subsea Engineering News* will be distributed Nov. 15. Until then, visit EPmag.com.

JOBS

Looking for a new job in the industry? Find opportunities in the jobs section at EPmag.com/jobs.

CONTACT INFORMATION

LEN VERMILLION Group Managing Editor
Digital News Group
lvermillion@hartenergy.com

CONTRIBUTORS:

Velda Addison (Houston)
Mary Holcomb (Houston)
Ariana Hurtado (Houston)
Joseph Markman (Houston)
Emily Patsy (Houston)
Alexa West (Houston)

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 or custserv@hartenergy.com; Website: www.epmag.com/subsea-engineering; Email for subscriptions: mpigozzi@hartenergy.com.

Copyright 2018. All rights reserved. Reproduction of this newsletter, in whole or in part, without prior written consent of Hart Energy is prohibited. Federal copyright law prohibits unauthorized reproduction by any means and imposes fines up to \$100,000 for violations. Permission to photocopy for internal or personal use is granted by Hart Energy provided that the appropriate fee is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. Phone: 978-750-8400; Fax 978-646-8600; Email: info@copyright.com.

2018 ANNUAL SUBSCRIPTION: £425 + VAT (WHERE APPLICABLE), \$675 USA. FOR MULTI-USER SUBSCRIPTIONS, CONTACT US OR CHECK THE WEBSITE. CREDIT CARDS ACCEPTED SUBJECT TO CHARGES.

HART ENERGY
1616 S. Voss, Suite 1000 • Houston TX 77057-2627 • USA
www.hartenergy.com | www.epmag.com



Follow us on Twitter @Hart EPMag