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**SPECIAL REPORT**

# Deepwater Solutions For Offshore West Africa's Oil & Gas Industry

OWI WA 2019, Deepsea Projects, Technology



Photo credit: Maersk Drilling

**OWI WA**  
Unlocking  
West Africa's  
potential in  
deepwater



**Offshore  
West Africa**  
Moving ahead  
with innovative  
projects

**Nigerian  
Content**  
Celebrating  
Nigeria's  
local content  
achievements



**Offshore  
Ghana**  
Spotlight on  
Deepwater  
projects





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# INTRODUCTION

This publication is a Special Report focused on Deepwater Solutions For West Africa's Oil and Gas Industry, featuring the region's major industry event, West African Offshore Well Intervention Conference (OWI WA). The event is focused on Subsea Well Intervention in the West Africa offshore market. It also covers latest trends and innovation in the industry.

In this publication, we featured some major deepsea projects offshore Nigeria and Ghana, especially in the Nigerian Oil & Gas Industry as Total's EGINA FPSO has started production from the Egina field off the coast of Nigeria. The Egina project was a successful collaboration between LADOL, Total, and several Government agencies and has proved that the largest industrial projects in the world can be completed in Nigeria. This is a first not only for Nigeria but also for Africa and it represents a remarkable achievement in local content development in Nigeria.

We will continue reporting about the latest trends in the industry on our subsequent editions.

Please send your feedback or general inquiries as we will be happy to respond as soon as possible.

**Tobi Owoyimika**  
Editor

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# OWI WA: Unlocking West Africa's Potential in Deepwater

Subsea Well Intervention

Well Service Companies

Operators and Deepwater Solutions

Vessels and Logistics

**O**ffshore Network Ltd will be organising The West African Offshore Well Intervention Conference (OWI WA 2019) scheduled to take place in Accra, Ghana, on June 4-5 2019.

OWI WA 2019 will explore the opportunities in subsea wells throughout West Africa, and providing a platform to network with industry stakeholders, players & operators in the oil and gas industry.

The project manager for Offshore Network, Will Hurl, provided an insight on the opportunities and how OWI WA conference is set to unlocking the potentials in West Africa's well intervention community.

According to report, West Africa's deepwater oil and gas patch, Riserless Light Well Intervention (RLWI) conducted from drilling or other support vessels is proving to be an important resource – providing a much faster and cheaper alternative to using rigs. A rising well intervention backlog and tight budgets means this effective solution needs to be quickly and widely deployed if legacy production declines are to be addressed.

**Let's start with a brief introduction about yourself and your work at Offshore Network Ltd?**

I am a project manager for Offshore Network and produce both the OWI West Africa and Middle East conferences. Through over 30 hours of in depth research discussions with industry experts I develop the conference agendas which highlight the main opportunities and challenges within each region. Our aim for each conference is to improve collaborative efforts and enable delegates to share industry knowledge and improve efficiency and opportunity throughout the well intervention discipline.

**What brought together the launching of West African Offshore Well Intervention Conference and what's the theme for the 2019 edition?**

There is a great deal of opportunity in West Africa and work seems to be ramping up. We chose West Africa as one of our 6 global well intervention conferences as there were no platforms which allowed the West African well intervention community to meet, learn the latest well intervention strategies and technologies. It also acts as a great networking opportunity for operators and service providers to form new business partnerships.

**This year's themes include:**

- Riserless Light Well Intervention
- Well Integrity
- Production Enhancement
- Opportunities for Vessels
- Logistics/Supply Chain Strategies

**What kind of opportunities does the event create?**

The conference allows operators to hear first hand case studies of recent campaigns within the region. Presenters will explain the main challenges faced during the campaigns and how they solved them. Timeline and costing figures are also provided, giving other operators insights into improving future well intervention strategies.

For Well Service providers it gives them the opportunity to showcase their products and services to local and international operators. It also informs them of the main challenges operators are facing and what operators need from service providers to improve overall efficiency.

**How do you think OWI WA could lay a strong foundation for the West Africa's well intervention community?**

We had extremely positive feedback from our first conference in 2018.



This year is proving even more popular and we have received a great deal of demand from operators and service providers to present and exhibit. We are confident the conference will act as the annual networking opportunity for the West African well intervention community.

**On your own perspective, what are the challenges and opportunities surrounding the industry?**

There is of course a lot of oil reserves in Africa meaning there is still a lot of opportunity for new explorations and thus more well intervention.

The main challenges at the moment are the logistical difficulties faced by all organizations working in the region.

OWI WA 2019 helps to improve these difficulties with our open panel discussion where regulators, operators and service providers discuss how best to improve the efficiency of working in the region.

**In terms of innovation, which of the companies do you think are making huge progress when it comes to deepwater technologies?**

We have a number of innovative companies joining us at OWI WA displaying their latest

deep-water technologies. The delegates will have to decide for themselves which companies are leading the way.

**Will there be a new deepwater technology to be showcased at the event?**

Yes there is plenty of new offshore technology such as new E-line milling systems, new turn mill machines, straddle and plug technologies and multi purpose support vessels to name a few!

## The West African Offshore Well Intervention Conference 2019 At A Glance

**T**he 2019 edition of West African Offshore Well Intervention Conference was launched as a meeting point for industry stakeholders, regulators, operators and service companies to discuss the opportunities, and discover innovative approach that enhance well performance in the West Africa region. The event also creates an opportunity for the West African well intervention community to collaborate and network in a way of exploring deepwater solutions for efficient operations in the region.

According to the organiser, This year's conference has been developed through carefully analysing hours of in depth research discussions with over 40 West African and global industry experts. The conference programme contains the latest well intervention case studies and technologies including; Market Overview, Production Enhancement, Vessels, Logistics and Supply Chain that is focused on the most critical solutions shaping the offshore West African well intervention market.

**MARKET OVERVIEW:** A forecast of market activity in West Africa for 2019-2020 with a specific focus on subsea well intervention.

• **RISERLESS LIGHT WELL INTERVENTION:** Analyse the latest RLWI campaigns throughout West Africa and discover whether this is the most reliable, efficient and cost effective practice

• **WELL INTEGRITY:** Explore how global well integrity methods can help you develop successful well integrity strategies for future West African campaigns

• **VESSELS:** Understand how multi-operator vessel campaigns could utilise dedicated and non-dedicated vessels to enhance LWI efficiency

• **PRODUCTION ENHANCEMENT:** Review the latest techniques including water shutoff, sidetracking and well stimulation to maximise well performance within deep and shallow waters

• **LOGISTICS AND SUPPLY CHAIN:** Understand how logistical experts foresee the market and learn strategies that will improve your supply chain efficiency and costs.

OWI WA conference aims to educate the community on the latest developments and opportunities in

order to improve overall well intervention campaigns. This year's conference will also feature networking sessions between regulators, operators and service companies.

The organiser produced OWI WA as an operator led conference, with 30% of attendees participating from Major, Independent and National Oil Companies. We are able to attract such a large portion of West Africa's operator community by designing our program around their specific well work needs. In turn this gives well service companies and contractors a fantastic opportunity to hear the latest updates from owners and offer solutions that can contribute to the next wave of workover projects.

**Get in touch with Will Hurl to find out more about participating at the conference**  
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# Africa's Oil & Gas Industry: Moving ahead with innovative projects

**Deepwater Projects** | There have been significant offshore campaigns in Africa's oil and gas industry, particularly in Nigeria, Ghana, Congo, Guinea, Uganda, Madagascar amongst others that will continue to attract investments in 2019.

According to report, there are eighty-eight upcoming oil and gas fields to receive more than US\$180 billion by 2025, with over 26 per cent of the investment being given to Nigeria. Nigeria remains Africa's largest oil and gas producer, although recent years have been challenging to the West Africa nation. In previous years, Nigeria's Senate passed the Petroleum Industry Governance Bill (PIGB), a new legal framework that seeks to reform how Nigeria's oil and gas industry is structured, regulated and funded. One of its goals is to ensure value addition and internationalization of Nigeria's petroleum industry through the creation of both efficient and effective governing institutions, with clear and separate roles and commercially oriented and profit driven entities.

From shallow water licensing in Congo Brazzaville, to billion-dollar tenders in critical infrastructure, there is a growing anticipation from the international companies to originate and win licences, farm down partnerships and finance within the African Oil and Gas sector.

Congo Minister of Hydrocarbons, Jean-Marc Thystère Tchicaya launched the Promotion of the country's License Round Phase 2 at Africa Oil Week (AOW) 2018 in Cape Town, South Africa.

According to the minister, The Republic of Congo focused on creating awareness for the License Round Phase 1 in 2016, which saw 30 international companies register to participate. The closing date for receipt of tender offers in Brazzaville will be June 30th 2019.

The Republic of Guinea is set to further develop the upstream sector and become a regional energy hub. Guinea is the 121st largest export economy in the world. The latest reports show that the top exports of Guinea are Gold (1.54B), Aluminium Ore



(\$990M), Petroleum Gas (\$154M), Non-fillet Frozen Fish (\$43.2M) and Crude Petroleum (\$41.9M) according to the HS Classification. Guinea has considerable renewable energy resources with energy demand in Guinea projected to rise. Reports highlight additional development of existing oil and gas deposits. Despite low oil prices affecting industry and operations, Oil and gas exports have been key to the country's growth which are expected to continue driving the economy going forward.

The Government of Uganda is fully committed to developing its petroleum sector across the entire value chain, and clear strides to move the country's key assets from the exploration phase into the development phase have been made. Uganda offers opportunities for companies looking to explore, develop and utilize its petroleum assets.

Ernest Rubondo, Executive Director of the Petroleum Authority of Uganda said that the country is open for

partnerships as Uganda is seen as one of the most commercially viable and prospective oil and gas environments in the world.

Speaking further, Chief Executive Officer for Uganda National Oil Company (UNOC), Dr Josephine Wapakabulo, said that UNOC is responsible for the State's commercial interests in Uganda's oil and currently looking for strategic partners who have the appetite, financing, technology and capabilities to deliver equitable and profitable projects in Uganda's oil and gas sector.

The Government of Madagascar has also announced the opening of the country's bidding round. The bidding round will continue to drive new business opportunities for exploration companies in Africa. Paul Sinclair, Conference Director added "The Madagascar bidding round offers a level of excitement that we have never experienced before at the Africa Oil Week. On top of the 15 confirmed ministers who led delegations to Africa Oil Week, we



now have a partnership with the Government of Madagascar, TGS and BGP to host what is clearly one of the most exciting rounds on the continent since the Cote d'Ivoire bidding round in 2017."

Exploration in Madagascar began in the early 20th century with the discovery of heavy oil-rich sedimentary basins in the west, however this frontier region remains relatively under-explored. The Island shares a maritime boundary with Mozambique, which is in the same oil province where large quantities of natural gas have been discovered. Studies conducted in collaboration with TGS and BGP have resulted in new data that suggest there is significant potential for future discoveries both on and offshore.

"With the aim of intensifying offshore exploration activities, we are delighted to announce that OMNIS will be inviting investment from interested parties, during a licensing round to start in November 2018. We are working together with TGS and BGP to create an attractive environment for exploration in the offshore, and we are confident that this will signal the start of renewed investment for the upstream oil sector in Madagascar," Voahangy Nirina Radarson, General Manager of OMNIS, commented.

#### Offshore Nigeria

In Nigerian oil and gas industry, Department of Petroleum Resources (DPR) is the regulatory agency of the oil and gas industry in Nigeria. The responsibilities of DPR includes; Conservation of Nigeria's Hydrocarbon Resources; Regulation and Monitoring of industry activities to ensure compliance with best standards & practices; Ensure safe, and environmentally sustainable development of the oil and gas operations' activities; Maintenance and administration of the national repository for archiving and retrieval of oil and gas data; Administration & management of acreages and concessions; Implementation of all government policies.

In the past decade, industry-wide production from deep water fields has added over 800,000 barrels per day to Nigeria's total oil output, which currently stands at around 2 million barrels per day. The Nigeria government has set ambitious targets to increase total oil production in the next few years and has set its sights on a big increase in deep-water exploration and production in particular.

*"Today, Nigeria is the biggest oil and gas producer in Sub-Saharan Africa and has the continent's largest natural gas reserves."*

### Celebrating Nigeria's local content achievements

According to the Minister of State for Petroleum Resources, Dr. Emmanuel Ibe Kachikwu, the impact of Nigerian Content in the oil industry has stimulated other sectors like Information & Communication, Automobile, Construction and Power to adopt some of the templates in their policy formulations. "We are also proud that some African countries like Kenya, Congo Brazzaville and Uganda as well as Gabon and Angola have come to Nigeria in the past for mentorship on Local Content initiatives."

The Group Managing Director of the Nigerian National Petroleum Corporation (NNPC), Dr. Maikanti Kacalla Baru, said the country has seen various achievements of Local Content in various sectors of the Nigerian economy. He noted that in "in 2010, the available in-country capacity for line pipes was 100,000 metric tonnes, just 10 percent of the annual industry demand of one million MT/annum. However, today, through the robust collaboration of NCDMB with NNPC and other stakeholders, the capacity of line pipes has been ramped up to 420,000MT/annum, representing 40 percent of industry demand."

Nigeria's oil and gas industry has progressed since 2010 when the Nigerian Oil and Gas Industry Content Development (NOGICD) Act was passed. The law positions Nigerian Local Content on the spotlight, and also mandated the Nigerian Content Development and Monitoring Board (NCDMB) to deepen the participation of Nigerians and Nigerian companies in the oil and gas industry, by facilitating local capacity development and ensuring that the execution of large components of any project is domiciled in-country.

The Executive Secretary, NCDMB, Engr. Simbi Wabote highlighted the Board's performance in 2018, dwelling particularly on the Nigerian Content 10-year strategic roadmap.

On the USD200 million Nigerian Content Intervention Fund (NCI Fund) launched to provide funding support to local service companies, Wabote said that \$21 million has been given out as loan to beneficiaries as at the end of October. "In 2019, we intend to develop and launch our investment policy to further provide flexibility to our funding and investment interventions."

He also hinted that in 2019 the Board "plans to support the establishment of at least one more modular refinery and participate in the LPG value chain if the condition precedent are in place"

NCDMB had in 2018 taken 30 percent equity in the 5,000 barrels per day modular refinery in Ibigwe, Imo State and commenced the construction of oil and gas parks at Bayelsa and Cross River States.

On the provision of constant power to the parks, Wabote said a thermal power plant was being constructed by the Nigerian Agip Oil Company (NAOC), which would also serve the oil and gas park in Bayelsa state while discussions are ongoing to source electricity from the NIPP station in Odukpani, Cross River State to supply the park situated close-by.

Other plans for 2019 include the finalization of the review of Offshore Rig Acquisition Strategy and posting of 20 trained marine personnel being trained by the Board, for their 1 year international sea time in fulfilment of the requirement for the Certificate of Competency (CoC).

The Executive Secretary also reported that the Board has commenced the forensic audit of remittances to the Nigerian Content Development Fund and fulfilled its promise to put in place 3rd party monitors to enhance compliance monitoring in the upstream, midstream, and downstream sectors of the industry.

He added that "By 2019, we intend to deepen and widen the roll-out of third party monitoring service providers for effective monitoring of the 51 operating companies and close to 8,000 oil and gas service providers registered on our NOGIC-JQS. In addition, we will further expand our compliance and enforcement framework to cover marginal field operators, midstream and downstream sectors."

He said the Board have established collaborative efforts with the Nigeria Customs Service, EFCC, NNPC, NAPIMS, Nigeria Immigration Service, FAAN, OGFZA, National Judicial Council and NIMASA and would sharpen those inter-agency collaborations going forward.





Today, Nigeria is the biggest oil and gas producer in Sub-Saharan Africa and has the continent's largest natural gas reserves. Population estimates range from 160-175 million and the UN forecasts that Nigeria could have the world's fourth largest population by 2030.

#### **Total's EGINA FPSO**

Three years after the enactment of the NOGICD Act, Total's Egina FPSO project came on board when Total made the signing of the Final Investment Decision (FID) in 2013. Egina FPSO is a testimony for the Nigerian Local Content to the fact that large deepwater projects can be developed with a very high level of in

-country activities.

The Egina oil field was discovered by Total Upstream Nigeria Limited (TUPNI) when the Egina-1 well was drilled within the Oil Mining Licence 130 (OML 130), some 200 kilometres offshore Port Harcourt, Nigeria. Located about 20km away from Akpo field, Egina field covers an area of around 500 square miles. It is situated at a water depth of up to 1,750m.

The capital expenditure (Capex) for the six packages in the oilfield development is \$16 billion, out of which \$3.3 billion is allocated for building the FPSO. Total has invested \$10 billion in Nigeria in the past five years with over 500 service stations in Nigeria.

December 29, 2018, Total started production from the Egina field off the coast of Nigeria. The Egina field will produce 200,000 barrels of oil per day, which represents about 10% of Nigeria's production. The project has also involved a record level of local contractors. Six of the eighteen modules on the FPSO were built and integrated locally, and 77% of hours spent on the project were worked locally.

Total Upstream Nigeria Limited operates OML 130 with a 24% interest, in partnership with Nigerian National Petroleum Corporation (NNPC), South Atlantic Petroleum - SAPETRO Ltd. (15%), CNOOC E&P Nigeria Limited, a wholly owned subsidiary of CNOOC Limited (45%) and Petrobras Oil and Gas BV (16%).

#### **Shell's Bonga Field**

The Shell Nigeria Exploration and Production Company (SNEPCo), which carries out Shell's offshore activities in Nigeria, is drawing on the Shell Group's industry leading deep water expertise to deliver safe, economic projects that provide jobs and training for Nigerians.

The Bonga field, which started production in 2005, was Nigeria's first oil and gas project in more than 1,000 metres of water. SNEPCo used one of the world's largest floating production, storage and offloading (FPSO) vessels for the project. Three hundred metres long and the height of a 12 storey building. The FPSO's deck spans an area as large as three football fields.

The Bonga FPSO has the capacity to produce 200,000 barrels of oil and 150 million standard cubic feet of gas per day. It increased Nigeria's oil production capacity by 10% when it began producing in 2005.

The vessel's capacity has been upgraded in recent years, enabling SNEPCo to unlock new energy resources. This included the start of production at the nearby Bonga North West field in August 2014, which is expected to contribute 40,000 barrels of oil equivalent a day at peak production, helping to maintain the facility's overall output. A third phase of the Bonga Main development was also approved in 2014

SNEPCo helped create the first generation of Nigerian deep water oil and gas engineers. Today, 90% of Bonga's core offshore staff are Nigerian. The project was completed with over 4 million man



hours of work and no time lost to injury. It was the first project to be executed under the Nigerian Oil and Gas Industry Content Development Act and supported the establishment of a local fabrication yard for subsea components, a pipe coating plant and a welding laboratory.

Bonga also stimulated the growth of support industries vital to deep water projects. These benefit the wider economy by boosting demand for a range of goods and services including boats, materials, floating hotels, helicopters, and manpower, creating jobs and providing a range of training and maintenance services to the industry locally.

The Bonga success story in a challenging operating environment can be attributed to individual, team and leadership contributions leading to export of 650 cargoes from a cumulative production of 616 million to date.

The Bonga safety performance, which from first oil in 2005 to date has zero fatality record on the FPSO and over 4.5 years LTI free, can be attributed to the high standards of safety culture adhered to by the team.

#### Offshore Ghana

eni Ghana Exploration and Production Limited, an eni subsidiary, recently awarded a contract worth \$545 million to Maersk Drilling, to deploy its new build drillship, Maersk Voyager, on the Offshore Cape Three Points (OCTP) Project, offshore Ghana. Currently, Ghana is currently Maersk Drilling's main operational base as the company has also received a contract extension to 2022 with an option to extend by one year. The OCTP project features oil and non-associated gas fields, and will access approximately 41 billion cubic metres of gas and 500 million barrels of oil.

Eni, via its own subsidiary Eni Ghana, operates OCTP with a 47.22% interest, while Vitol and Ghana National Petroleum Corporation own 37.77% and 15% stakes respectively. First oil was produced in 2017 and initial gas in 2018, with peak production planned to be 80,000 barrels of oil equivalent per day (boepd) in 2019. The project will provide domestic gas supply to Ghana's thermal power plants for over 15 years.

Maersk Drilling has also signed a contract with Aker Energy for Maersk Viking, an ultra-deepwater drillship, to drill the Pecan-4A appraisal well in the Deepwater Tano Cape Three Points (DWT/CTP) block offshore Ghana. The contract covers one firm well, Pecan-4A, and two optional wells. Maersk Viking is the third rig operating Offshore Ghana.

## Egina OLT buoy performs excellently during first crude oil lifting

*...powered by NOV's Buoy Turret Loading System (BTL) concept*



**T**otal Upstream Production Nigeria (TUPNI) has praised NOV's Buoy Turret Loading System (BTL) concept, commenting that the "Egina OLT Buoy performed excellently during First Crude Lifting." With an average of 6000 m<sup>3</sup>/hour, the first offload of 1,000,000 barrels in just 28 hours went according to design and performance.

APL is proud to have contributed to this successful achievement.

TUPNI originally awarded NOV's APL business unit the offshore loading terminal (OLT) contract for the development of the Egina field on March 15, 2013. The BTL concept was

successfully free launched via slipway at Aveon Offshore, Port Harcourt, Nigeria and handed over to Total on August 2, 2018.

The Egina field is located in the OML 130 block, which is 150 km off the coast of Nigeria. The field is being developed by TUPNI in partnership with the company's coventurers NNPC, CNOOC, SAPETRO, and Petrobras. The OLT, weighing in at approximately 1,000 tons, will be moored in water depths of approximately 1500m.

APL performed more than 2,000,000 man-hours without a single lost time incident, highlighting a culture of safety and commitment to excellence. Installation and offshore commissioning exceeded Nigerian content commitments and will set the standard for future EPC projects in West Africa.



# Offshore Ghana:

## Maersk Voyager Exploring Deepwater Projects

**Offshore Ghana |** There have been significant development campaigns of oil & gas activities in West Africa, particularly in Ghana where Maersk Drilling is currently using its newly built drillship, Maersk Voyager, for drilling services to oil companies. .



Since 2015, Maersk Drilling was awarded a contract from eni Ghana Exploration and Production Limited, an eni subsidiary, to deploy Maersk Voyager on the Offshore Cape Three Points (OCTP) Project in Ghana. The contract period is about 3.5 years with an option to extend by one year. The contract has been extended to 2022. The total estimated revenue from the contract is USD 545 million including mobilisation and escalations.

There have been no loss time incident during the operation at Offshore Cape Three Points (OCTP), located about 60km from the Ghanaian Western Region's coast. The OCTP project features oil and nonassociated gas fields, and will access approximately 41 billion cubic metres of gas and 500 million barrels of oil.

According to Maersk Drilling, Maersk Voyager is the last in a series of four ultra deepwater drillships in the company's rig fleet. The rig was delivered on the 6th of February, 2015, from the Samsung Heavy Industries (SHI) shipyard in Geoje-Si in South-Korea. The four drillships represent a total investment of USD 2.6bn.

The drillships features dual derrick and large subsea work and storage areas, the design allows for efficient well construction and field development activities through offline activities. With their advanced positioning control system, the ships automatically maintain a fixed position in severe weather conditions with waves of up to 11 metres

and wind speeds of up to 26 metres per second. Special attention has been given to safety on board the drillships. Equipped with Multi Machine Control on the drill floor, the high degree of automation ensures safe operation and consistent performance. Higher transit speeds and increased capacity will reduce the overall logistics costs for oil companies.

Eni, via its own subsidiary Eni Ghana, operates OCTP with a 47.22% interest, while Vitol and Ghana National Petroleum Corporation own 37.77% and 15% stakes respectively.

First oil was produced in 2017 and initial gas in 2018, with peak production planned to be 80,000 barrels of oil equivalent per day (boepd) in 2019. The project will provide domestic gas supply to Ghana's thermal power plants for more than 15 years.

Another key project that was awarded to Maersk Drilling is Pecan-4A appraisal well in the Deepwater Tano Cape Three Points (DWT/CTP) block offshore Ghana. Aker Energy and

Maersk Drilling signed a contract to use its ultra-deepwater drillship, Maersk Viking, to drill the Pecan-4A appraisal well.

According to the company, The contract covers one firm well, Pecan-4A, and two optional wells, and it is expected to start operation in the fourth quarter of 2018 when it sails to the Pecan field, offshore Ghana.

Maersk Viking was built in 2014 with stateof-the-art facilities and systems, the drillship will perform the drilling in a water depth of 2,674 meters in the Deepwater Tano Cape Three Points (DWT/CTP) block. Maersk Viking drillship is currently in Ghanaian Waters ahead of schedule.

Maersk Viking is an advanced ultra-deep water drillship, capable of drilling in water depths of 3,600 meters. Under its contract with Aker Energy, the rig will perform the drilling of the Pecan-4A appraisal well in a water depth of 2,674 meters, located approx. 70 miles off the coast of Ghana, in addition to two optional wells.

The drilling rig is owned by Maersk Drilling and features a drillship design with a dual derrick and large subsea work and storage areas, allowing for efficient well construction. With its advanced position control system, the ship automatically maintains a fixed position in severe weather conditions with waves up to 11 meters and wind speeds of up to 26 meters per second.

The contract is awarded by Aker Energy on behalf of the license group and as the operator of the DWT/CTP block. Aker Energy is the operator of the block with a 50% participating interest. Aker Energy's partners are LUKOIL (38%), Ghana National Petroleum Corporation (10%) and Fueltrade (2%).

Aker Energy is targeting approximately 450 million barrels of oil equivalent (gross). The plan is to develop the Pecan field with a purpose-built FPSO connected to a subsea production system at 2,400 meters below sea level offshore Ghana. The company plans to submit the Plan of Development (PoD) in 2018, with anticipated first oil in 2021 and a plateau production of ~125,000 barrels of oil per day.





Maersk Drilling sees offshore West African market as an emerging market that will drive growth and remain competitive in the global oil & gas industry.

In other countries around Africa such as Angola, Maersk Drilling has successfully carried out some projects there from 2012 to 2016. In total, Maersk Drilling has had operations in 11 different African countries so far, with Egypt being the third African country where the company have been present for an extended period of time, and with a strong operational record.

Maersk Drilling is a strong fit for the operators in Africa's offshore oil and gas industry. The company's fleet is one of the most modern offshore fleets in the world, using state-of-the-art equipment and a vast trove of experience from the challenging North Sea markets. Maersk Drilling is using its North Sea working experience as the foundation for exceptional performances in offshore Ghana where they have successfully developed oil fields much quicker than forecasted, which of course translates into money saved for operators.

When it comes to local content development in Ghana, Maersk Drilling have built up its operations in Ghana and continuously increases the share of local content on its rigs. The company currently operates three drillships offshore Ghana.

Currently, Maersk Drilling have a total of 260 locals employed in Ghana – 238 offshore and 22 onshore. That's 55% of the total positions in Ghana which are filled by local content.

In Angola, Maersk Drilling contribution to local content was up to 60% after four years of operations, and they are well on track to reach similar numbers in Ghana.

Maersk Drilling sees West Africa as one of the few regions of the world where there are unexplored areas with huge potential. The company says Senegal and Mauritania as really interesting emerging offshore markets, with the Ivory Coast, Equatorial Guinea and Namibia as other "hot spots" going forward.

In terms of Offshore Technology, Maersk Drilling has a long-standing experience in the North Sea which has allowed the company to test and build a very robust and efficient operating model, try new technologies and innovations, and consistently optimise its performance. Most of these improvements have been rolled out throughout the company's fleet, to the benefit of current and future operations in African waters.

In addition, a lot of the company's long-term employees started their careers in the North Sea and have moved on from jack-ups to deepwater drillships. This has allowed Maersk Drilling to use its long-time North Sea experience in other regions including Africa.

Maersk Drilling introduces new business models with the operators, sharing pain and gain on the well.

According to Maersk Drilling's 2018 annual report, the company recorded a strong profitability and cash flow generation despite the challenging market conditions. The company's profit for 2018 was driven by high contract coverage and a good operational performance.

Maersk Drilling continues to see high demand for its ultra harsh environment jack-up rigs in the Norwegian sector in which Maersk Drilling holds a leading position. The market for floaters remains challenged with overcapacity and utilisation at a level not yet able to support material pricing improvements.

As of 31 December 2018, Maersk Drilling had a net debt of USD 1,097 million and liquidity reserves of USD 772 million.

Maersk Drilling provides safe, efficient, and reliable drilling services to some of the leading and most innovative oil and gas companies around the world. This has resulted in one of the strongest contract backlogs in the industry, thereby reducing the near-term exposure to the market.

***Maersk Drilling owns and operates a fleet of 23 mobile offshore drilling rigs specialising in harsh environment and deepwater operations. With 46 years of experience operating in the most challenging environments.***





# **Total Service Station: Goes beyond Petroleum Products**

Total is one of the largest international oil and gas companies in the world involved in Upstream, Midstream and Downstream activities not only to produce energy but to supply energy to the people. The Group operates in more than 150 countries. The Group is also a first rank player in chemicals. Its 96,000 employees put their expertise to work in every part of the industry – exploration and production of oil and natural gas, refining and marketing, gas and new energies, trading, and chemicals.

In Nigeria, Total operates over 550 service stations across the country, all strategically positioned to ensure quality products and services from Total. The company is also expanding its global network of service stations in order to be closer to its customers on daily basis. Becoming veritable 'one-stop-shops', its 16,000 stations offer quality products and services tailored to customer needs.



Total service station in Onigbagbo, Ikeja, Nigeria, is equipped with solar panels, launched in Lagos on June 12, 2014 and making it the first self-powered station in West Africa. In Berlin-Schönefeld, Germany, its station is completely autonomous and powered by a combination of fully renewable energies (solar, wind and hydrogen).

The Solar-powered filling station is a new innovation introduced by Total Plc which is a revolutionary journey to encourage the use of safe energy in Nigeria. The construction of the service station is part of efforts aimed at providing energy solutions that are efficient and environmentally friendly.

The Onigbagbo Total solar service station is an integral part of the group's efforts to reinforce our network identity with a resolutely contemporary image, installations that are more energy-efficient and outlets that blend harmoniously into the environment. The SunPower photovoltaic panels on its forecourt roof convert the sun's rays into electricity. This electricity is used to supply renewable energy to power the entire service station.

Its eco-friendly design, transparent canopy, earthy and neutral color tones and green area creates a warm and welcoming environment for our esteemed customers. This innovative service station also features zero emissions of harmful green house gases, zero noise pollution, and a renewable energy source. Therefore, whether customers fuel, service or wash their cars or simply get cold drinks at its Café Bonjour shop, they are partnering with us to build a more sustainable environment.

The establishment of the solar powered service station clearly depicts Total's dedication to continuous improvement and the establishment of an identity related to constant innovation that makes Total different in the global energy industry.

Total's management said the innovation was part of the company's effort to catch up with the ongoing energy revolution. The service station, which also houses a departmental store makes it less dependable on public electricity or fuel to power generating sets as well as boost customers confidence in its services.

The goal within the next five years is to equip 5,000 Total stations with solar panels. This project is equivalent to installing approximately 200 megawatts of power and represents an investment of close to \$300 million. It will reduce the CO2 emissions by 100,000 metric tonnes per year.

The Group are also present in Africa, where it have been involved in distribution for over 80 years. Total is the leading distributor of petroleum products with 4,300 stations located throughout 36 countries.

In Africa, for example, where more than 70% of the population is equipped with a mobile phone, Total offers m-payment and money transfer solutions in partnership with providers such as Orange and Airtel. This service already exists in 20 African countries and will soon be extended to 10 others.

Total network consists of 16,000 service stations in 66 countries, situated in city centres, suburban areas and along major roads and highways. This includes the European AS24 network devoted to heavy goods vehicles, with its 770 stations located throughout 28 countries.

Total have developed a smartphone app. Available in seven languages, it suggests routes and indicates the location of its stations and the services they provide.

#### **Lubricants:**

Total's globally acclaimed range of lubricants are developed through continuous research & innovation, and in cooperation with equipment manufacturers to create high technology, energy efficient products for optimal performance and protection of machinery.

As the world's fourth largest distributor of lubricants and the leading distributor of petroleum products in Africa, Total Marketing Services operates 50 production sites worldwide where it manufactures the lubricants, bitumen, additives, special fuels and fluids that sustain its growth.

Paris, January 11th, 2018 - Total Lubrifiants, a world leader in lubricants, and Temot, a global automotive parts and accessories purchasing company, entered a new partnership agreement. This three-year strategic partnership began on 2017 and will enable customers around the world to benefit from TOTAL's broadest and most powerful range of lubricants available today.

#### **Bonjour Shop**

Total has also diversified its line of products and services offered at its stations, which are becoming true 'one-stop-shops' and opening its network to partners providing food service. Stopping at a station provides an opportunity to do much more than just stretch your legs.

You can grab a snack, drink and so much more in Total's Bonjour shops. The company have also partnered with top quick service restaurants such as Chicken Republic and KFC to ensure all your needs are met at one-stop.

#### **Car Wash**

There are 3 decisive features in selecting a car wash, Wash quality, Vehicle protection and value for money; Total offers a variety of car wash packages covering all three features that ensures your car gets the shine it deserves.

In Nigeria, the company's car wash are located at Igbobi Service Station, Ikorodu Road, Ikeja etc... Over 20 of its stations have the manpower to give your car a good traditional hand wash.

Total Wash centres also demonstrate its commitment to eco-responsibility as 150 of these facilities recycle around 75% of the water they use.

#### **e-cash**

Financial Services in Total Service Stations. In making Total a one stop shop for all your needs. Automated Teller Machines (ATM) is installed in select stations in Nigeria.

#### **Quickteller**

A platform called Quickteller is available in stations to facilitate the performance of other financial transactions such as mobile money services, bills payments, Airtime vending,

funds transfer and collection points for international remittances e.g. Western Union, Money gram, account opening for banks and lots more.

#### **Total e-cash - \*737# Cashout**

Total customers can now make cash withdrawals in select Total Service Stations without an ATM as the company has partnered with GTBank. Total Nigeria Plc now offers customers the opportunity to get cash from selected stations with the "dial of a button".

#### **How does it work?**

Customers dial a USSD string on their mobile phones e.g. \*737\*35\*AMOUNT\*SAP CODE# to withdraw cash from Total service stations.

The customer's GT Bank account is debited by the amount withdrawn, and Total's account is credited.

The station staff then releases the cash to the customer.

#### **Benefits**

Convenient service for the customer through Instant cash out. Reduces the need to go to the ATM or bank to withdraw cash.

Enhanced liquidity management: Total Stations are able to manage cash and save time in going to the bank to deposit cash.

No installation or capital expenditure required: GTBank has provided the phones required for the 50 (fifty) stations in the pilot phase.

#### **Courier Service:**

DHL Express, the world's leading international express services provider and Total, Nigeria's leading multinational energy and provider of convenience services have come together to provide customers with better access to global express services. A consumer looking to send documents or parcels overseas can simply walk into a Total service station to send their shipment, ensuring greater convenience and accessibility to the over 220 countries and territories that DHL serves. This further emphasizes TOTAL's vision of being a one-stop service center that caters to the growing needs of consumers beyond just the provision of petroleum products.



# Enpro Subsea: Oil & Gas Production Optimisation Specialist

Aberdeen-based Enpro Subsea Ltd, is a production optimisation specialist that delivers an enhanced subsea architecture to support the full 'Life of Field' of subsea assets from development phase through to decommissioning with innovative technologies. The company uses its technologies to maximize the ultimate recovery from subsea wells by enabling production enhancing technologies on standard hardware while structurally reducing field development costs and delivering first oil faster.

Enpro competes globally as a production optimisation specialist and has a strong footprint in Americas, and building a strong business portfolio in Brazil and other part of the world. The company has a track record in Gulf of Mexico and Ghana where its patented flow access module (FAM) technology was selected by BP, LLOG and Tullow with 41 FAMs, now being adopted by operators globally. The patented Flow Access Module (FAM) enables maximum ultimate recovery from subsea wells. It creates an enhanced production 'USB port' within the jumper envelope, enabling the use of standard Xmas Trees and Manifolds, with the FAM providing life of field flexibility within the system design. FAM enables a range of enhanced production options by allowing the Operator to adapt the technology within the FAM to suit the needs of the reservoir.

Enpro's FAM was first deployed in 2016, since then, about 35 of its patented Flow Access Modules (FAM) are being used by major and independent operators globally. It has also seen its Flow Intervention Service (FIS) technology used to complete hydraulic intervention projects across multiple subsea wells in West Africa, and has ongoing subsea operations with a North Sea operator decommissioning its gravity based concrete structures. The Flow Intervention Services (FIS) is a field proven intervention system for low cost hydraulic intervention.

Enpro's FIS systems deliver multiple scale squeeze and fluid intervention processes including acid stimulation, chemical injection, scale removal, pipeline pre-commissioning and flowline clean and tubing washes and are suitable to a range of water depths.

In 2018, Enpro's FAM technology was selected by LLOG for oil exploration from their Crown and Anchor field in the Gulf of Mexico as it fully aligns with their strategic approach to fast track,



capital efficient subsea tiebacks.

The FAM technology enabled LLOG successfully delivered first oil production from the field. FAM enables a range of enhanced production options including water cut metering, flow assurance, hydraulic intervention and fluid sampling, allowing the Operator to adapt the technology within the FAM to suit the needs of the reservoir. The company secured several projects currently ongoing in the UK Continental Shelf, West Africa, and Gulf of Mexico. The deal will see the business receive backing from EV Private Equity as part of its pledge to invest \$200m into fast-growing North Sea businesses.

Over the years, Enpro's FAM technology received prestigious award at major industry events such as Offshore Technology Conference (OTC). The company was recognised for its patented flow access module (FAM) technology which was a contributing factor to a major operator in the Gulf of Mexico achieving first oil in just 11 months – a record time for the operating company and one month ahead of schedule. The flow access technology reduced project costs, weight and enables operators to adopt a capital efficient field development strategy while still using low cost standard subsea hardware.

The Scottish Government has fully supported Enpro's deepwater innovation which in previous years announced plan to invest £1.5million to develop Enpro's flow assurance technology in order to explore research & development in deeper waters in emerging markets. Scotland already accounts for around 14

per cent of the global subsea market, comprising approximately 370 companies generating an estimated turnover of £7.5 billion. Supported predominantly by the oil and gas sector, with the right investment and support, the world-renowned skills and knowledge developed in Scotland have the potential to extend into sectors such as construction and defence to truly maximise the significant opportunities for Scotland from this global market.

In deepwater campaigns, Enpro offers a patented **ISSI (Integrated Subsea Sampling and Injection)** systems that allows safe access to hydrocarbons at the wellhead and enables multiple production optimisation solutions including reservoir stimulation, scale squeeze, well kill, decommissioning, multiphase metering and fluid sampling. For field decommissioning and development, company also offers a low risk method of accessing trapped attic fluids in GBS concrete cells which enables Operators to meet their OSPAR decommissioning obligations.

Enpro has been supporting and assisting owners and operators evaluate their assets to aid investment decisions, build field development and production enhancement strategies to maximise the value from the portfolio.

In 2019, Enpro was selected in the categories of 'Best Company' & 'Global Export' at the prestigious 2019 Subsea UK awards. Leaders of the UK's £7.5bn sector are celebrated at the prestigious ceremony, which took place on Wednesday, 6th February, 2019, at the AECC.



# NOV: Providing Deepwater Solutions for Offshore Oil & Gas Industry Globally

**N**ational Oilwell Varco (NOV), U.S. based company, provides deepwater solutions for oil companies operating in the offshore oil and gas industry globally. Throughout every region in the world and across every area of drilling and production, NOV provides Rig Technologies, Wellbore Technologies, Completion & Production Solutions with the right technical expertise, advanced equipment and operational support necessary for an efficient operation. The company have the people, capabilities and vision to serve the needs of clients in the oil and gas industry.

When it comes to innovation, NOV covers the entire value chain of the deepwater segments, providing its business innovation, product creation and service delivery that is driven to power the industry.

## Rig Technologies

NOV has a long outstanding history of manufacturing advanced drilling equipment packages to solve the industry's operational challenges. The company also offers its deep expertise to help minimize risk, increase uptime and improve performance in drilling operations around the globe.

NOV designs new technology and robotics that deliver increased automation, and building new fabrication facilities to shorten lead times. And, the company's training program offers to assist its clients close the industry's generational gap in a way of developing smarter, more advanced drilling solutions for all types of land and offshore environments.

As part of its effort to improve uptime and reliability, NOV launched a new Fleet Care Program dedicated for all kinds of Technical Support and Engineering Services, Field Service and Repair, Spare Parts, and Training that will keep a rig running. With various equipment of rigs around the world, NOV, also provides comprehensive aftermarket products and service solutions that assist drilling contractors and operators keep their fleets running safely and efficiently.

In Marine and Construction, NOV, products include jacking, skidding, and fixation



systems along with machinery for mooring, anchor handling, and deck handling. The company's value added service offers a wide range of cranes including heavy lift, knuckle boom, active heave, and lattice boom. Its capabilities also include enhanced engineering, design of mobile offshore units, and integration for offshore drilling and construction vessels with wind, pipelay, and cable lay capabilities.

As the oil and gas industry has extended the boundaries of geology and engineering with the push into ultra-deep water and onshore unconventional plays, the Rig Equipment business unit has met the increasing challenges of its customer base with constant improvements to both its land and offshore rig and equipment offerings. A recent example of this is the NOVOS™ automation platform that offers fleet wide drilling process automation leading to dramatic improvements in drilling efficiency, reliability, and performance.

## Wellbore Technologies

NOV teams bring deep knowledge, rooted in hands-on experience, that helps design and deliver the necessary equipment, innovative technologies and specialized services to optimize the performance of every project. From fluid control systems and tubular inspection services, to downhole products and automation solutions, NOV is a true partner that helps you control costs, react quickly and maximize productivity.

## Completion & Production Solutions

In every type of environment, NOV bring together engineering operational expertise and field-proven solutions with a foundation of safety and risk management that helps clients control costs and achieve lasting success.

During the EGINA project, Total Upstream Production Nigeria (TUPNI) awarded NOV's APL business unit the offshore loading terminal (OLT) contract for the development of the Egina field on March 15, 2013. The BTL concept was successfully launched via slipway at Aveon Offshore, Port Harcourt, Nigeria and handed over to Total on August 2, 2018.

According to Total, NOV's Buoy Turret Loading System (BTL) concept for EGINA performed excellently during First Crude Lifting." With an average of 6000 m<sup>3</sup>/hour, the first offload of 1,000,000 barrels in just 28 hours went according to design and performance. Total further stated that this is the first time a buoy, the APL Egina, has been delivered ahead of the FPSO on a Total project.

APL performed more than 2,000,000 man-hours without a single lost time incident, highlighting a culture of safety and commitment to excellence. Installation and offshore commissioning exceeded Nigerian content commitments and will set the standard for future EPC projects in West Africa.



# Oceaneering: Re-shaping the Future of Oil and Gas Industry

Since 1969, Oceaneering International has positioned itself to become a subsea technology provider for the offshore oil and gas industry. Through its innovative technologies, Oceaneering is now a one stop shop to solve the industry's decommissioning challenges, providing discrete tools to offering a turn-key, end-to-end decommissioning solution and with a track record that has been tested and trusted globally. The company has the capable of performing large work scopes including vessel services, ROV, tooling, and project management.

## Pipeline Repair

Oceaneering has serviced and repaired over 5,000 PIPELINES worldwide with its technologies which is a reliable solutions that minimize environmental impact and restore production quickly. Avoid severe economic and environmental impacts associated with subsea pipeline failures and sudden production stoppages as Oceaneering offers a broad range of services which include; subsea inspection, identify failure modes, prepare damaged assets, and perform repairs that bring your production back online quickly. When it comes to creating the best pipeline repair solution, Oceaneering is committed to Connecting What's Needed with What's Next™.

Oceaneering deploys a remotely operated vehicle (ROV) or autonomous underwater vehicle (AUV) to visually inspect pipelines and identify anomalies. The company work based on client's requirements to ensure it provide the most reliable and cost-effective solution. It dredging technologies remove debris and expose the damaged subsea pipeline. Oceaneering uses its extensive experience with coating removal, including concrete and fusion bonded epoxy (FBE), to ensure direct access to the pipeline's base material.

For Pipeline Inspection, Oceaneering deploy advanced screening and assessment tools to evaluate subsea pipeline integrity to screen miles of pipeline in order to locate anomalies. Oceaneering uses detailed methods and subsea inspection technology to define anomaly characteristics, both internal and external to the pipeline.



Exploring the Well Intervention Community, Oceaneering have increased client production by more than 15 MILLION BARRELS, restore production from a well faster with the industry's most effective, safe, and reliable vessel-based well stimulation solution. The company developed the industry's first subsea rigless stimulation system and have performed dozens of successful deepwater interventions over the years.

In terms of a Damage Remediation, Oceaneering help maximize flow and protect a client subsea assets by safely and effectively remediating production-reducing damage mechanisms. Working with client to develop the best stimulation plan for reservoir—from front-end engineering and design (FEED) studies to the development of an operability matrix, and even in the deepest waters, Oceaneering remediate migrated sand and remove scale, wax, paraffins, and asphaltene formations to restore a positive productivity index. The company have successfully stimulated subsea wells in up to 6,700 ft (2,042 m) of water.

When it comes to innovative tooling solutions, Oceaneering has an industry-leading portfolio of subsea intervention tooling—including a proprietary well stimulation tool (WST) and rapid access tool (RAT)—that provides reliable access to wellbore. Unlike traditional rig-based well stimulation systems, Oceaneering does not require the use

of a blowout preventer (BOP)—the company ensure safe operations by providing a double barrier for well control.

Oceaneering WST features redundant disconnect systems with spill-proof connections—an emergency quick disconnect (EQD) system ensures that the vessel can detach from the wellhead with zero leakage. Its EQD can be actuated on-command from surface, or automatically subsea in case of unexpected pressure increases.

By using an Oceaneering vessel or a vessel of opportunity, it reduce overall project costs by as much as 50%, and deliver solutions on schedule. In some cases, the company can mobilize its systems especially during multi-well stimulation campaigns.

Oceaneering MSVs are ready to solve a range of challenges with onboard ROVs, subsea heave-compensated cranes, built-in chemical storage (5,000 bbl), fire suppression, high-horsepower pumping, dual open water coiled tubing risers, and flying leads. While for subsea flow performance, Oceaneering can achieve pumping rates up to 15,000 psi at 20 bbl/min, and can address multiple treatment stages. The company ensure that, when there is not sufficient room to store pre-mixed chemicals onboard, they are prepared to mix chemicals in order to keep operations on schedule and within the ideal weather window. With seamless



topside pumping integration and remote control of a well. Oceaneering provide the most effective stimulation possible, and making sure the client have the access to properly dose acids, solvents, or diverters—in a matter of hours or days, not weeks.

When it comes to Well Intervention, Oceaneering interchangeable riserless intervention system (IRIS) and the Blue Ocean riserless intervention system (BORIS) are designed to perform reliably in depths to 10,000 ft (3,000 m) and pressures to 10,000 psi.

Oceaneering have a consistent track record running the IRIS system in a variety of common and a typical downhole scenarios. The system is integrated with a custom-fit subsea intervention lubricator (SIL) and it uses a deepwater umbilical with a pulling capacity of up to 20 tons. For LWI systems, the company offer the industry's broadest functionality, resulting from extensive field experience and post-deployment analysis and have achieved multiple industry firsts in riserless LWI. Some of Oceaneering track records include; The world's deepest water depth for riserless intervention—8,200 ft (2,500 m)—with both slickline and e-line, the industry's first riserless, live in-flow testing, and the first use of a 5/16-in e-line

For hydraulic and mechanical intervention, Oceaneering LWI system enables the client to achieve critical well stimulation objectives, effectively restoring or enhancing production from subsea wells. The company use hydraulic actuation to access live wells and carry out prescribed acidization or other light intervention programs.

During mechanical LWI, proprietary equipment and tool designs enable increased recovery while reducing costs in a wide range of subsea scenarios. And, Oceaneering uses fit-for-purpose wireline tractors, milling, and logging tools, and gauge rings to perform a wide range of tasks such as; subsea well and infrastructure diagnostics, sliding sleeve intervention, remediation on damaged wells, plugging and abandonment and workovers.

Each hydraulic or mechanical LWI operation is planned, deployed, and overseen by Oceaneering subsea engineers and technicians, downhole wireline engineers, and project managers. The teams provide full-time site supervision and engage in close customer collaboration while adhering to rigorous QA/QC standards.

Recently, Oceaneering received a two-year Integrity Management contract with Total E&P Danmark to support its significant Tyra Redevelopment project in the Danish North sea. The company's scope includes the full development of Tyra's integrity management program, developing risk-based assessments (RBAs) that will enable effective and optimized inspection and monitoring for all pressure systems and piping, topsides and jacket structures as well as pipelines.

Managed from its Aberdeen office, Oceaneering will use a multi-disciplined team of corrosion,

inspection, structural and pipeline engineers, with specialist experience in delivering large-scale integrity scopes.

In addition to the Tyra Redevelopment, Oceaneering provides a range of other services to Total, from topsides inspection management services in the UK North Sea to ROV, tooling, and survey support globally.

Tyra, in production for over three decades, is a unique field. It processes 90 percent of the Denmark's gas production. Redevelopment not only secures production at the field for the next 25 years, but the infrastructure will enable operators to pursue new gas projects in the northern part of the Danish North Sea.

At peak production it is expected to produce the equivalent of supplying 1.5 million Danish homes with gas. The investment in this project is the largest of its kind within the Danish North Sea.

Oceaneering's Asset Integrity business provides integrity management capabilities, conventional and advanced non-destructive testing (NDT) and specialist inspection solutions, with a team of over 2,100 technically focused people, servicing customers from 24 global locations, headquartered in Houston, Texas, with a regional headquarters in the Americas, Asia, Africa, Europe, and the Middle East.

## Wired drill pipe will be the enabler for future drilling campaigns

**T**he frame agreement signed with Equinor in December is another step forward for wired drill pipe technology, which enables telemetry-related time savings, increased drilling performance, and optimum wellbore placement through integration of real-time downhole tool data and surface software applications. IntelliServ™ is clearly more than just wired pipe — it is a technology enabler, allowing any operator to see the downhole drilling environment with

clarity and accuracy in real time, which was previously impossible. New technologies enabled by wired drill pipe technology are continuing to come into play, with a focus on real-time risk management in complex, challenging drilling environments. The IntelliServ high-speed telemetry network allows data-driven activities to occur almost instantaneously versus taking minutes at a time with

traditional telemetry methods. Wired drill pipe also enables effective integration of downhole dynamics tools, such as the BlackStream™ ASM tool, and drilling performance applications, such as SoftSpeed™ II, into real-time drilling operations. When combined with NOVOS™, the entire system enables full closed-loop drilling automation, with applications analyzing data from downhole and distributing demands to the rig's control system to automatically adjust parameters and controls.



## Wild Well Control: Providing Onshore and Offshore Well Control Services

**E**stablished in 1975, Wild Well is the world's leading provider of onshore and offshore well control services ranging from emergency response, pressure control, relief well planning, engineering, environmental, plus training services. The company expanded its Montrose facility at South Ferryden, UK, providing its services on a global basis.

The company provides its services on a global basis, and responds to an estimated 80% of the global well control market. It also approaches each well control from an engineering perspective, and works to secure well integrity while protecting the operator's investment, and delivering comprehensive prevention and preparedness planning to avoid future emergencies.

Wild Well also offers well integrity audits which will identify concerns or issues with the wellhead – such as corrosion, inoperable equipment, leaking scenarios, etc. Based on the issues, the audits can prioritize the wells needing attention. The teams will also review the well sites and conduct preliminary planning should a relief well be needed. Identifying the location of the relief well can save valuable time in an emergency response.

With advanced engineering services, atmospheric (gas) dispersion modeling can be conducted identifying possible concerns during an event such as evacuation of populated areas. In the event of a fire at the well site, advanced engineering can model radiant heat to determine possible threats to other assets.

Storage Well Operators can depend on Wild Well for both emergency response services in the event of a well control issue and for non-emergency services that can help identify and mitigate other concerns – either preventing an event or helping minimize the size of an event should one occur.

At Montrose Port, Wild Well has a product known as the WellCONTAINED™ subsea containment system that provides the most comprehensive package of subsea emergency response services in the offshore oil & gas industry. The equipment is staged in a ready-to-deploy state and includes full subsea well intervention systems, including a subsea capping stack,



debris removal shears, hardware kits for the subsea application of dispersant and inhibition fluids and other ancillary equipment.

According to the company, the facility investment reflects Wild Well's long-term commitment to support its clients by providing the best-in-class response to a subsea capping and containment incident. The company's highly qualified emergency response well control and subsea engineering personnel deliver innovative solutions in a timely manner and its commitment to the existing warehouse and extension build-out provides an optimum working environment for the WellCONTAINED™ service line.

In Permian Basin, Wild Well is expanding on its current operations in West Texas in order to stay abreast of the increase in rig count. In addition to a full firefighting package, it also have a full suite of specialized intervention equipment available to the region. The Permian Basin continues to meet and surpass production expectations. It is a rich play that allows operators to explore and Wild Well Emergency Response Equipment, Personnel are ready for action in Permian Basin.

With more than 40 years of emergency well control response experience, Wild Well maintains equipment and personnel strategically positioned throughout the world. Its commitment to the Permian Basin is part of a long-standing history with the Texas oil and gas industry.

Wild Well warehouse, located in Midland County, houses emergency

response equipment for rapid mobilization. The company maintains the equipment in a "ready-to-go" state through a maintenance program designed to provide customers with industry-leading service. The equipment has been called into action by local operators for both emergency response and for preventative measures during critical well operations.

### Risk Management

Based on the experience of responding to more than 80% of all blowouts worldwide, Wild Well has been able to offer world class preparedness services. The company emergency response preparedness services assist operators to plan, prepare, and respond to well control emergencies and associated hazards. Ultimately, this level of emergency preparedness can save time, money, and most importantly, lives, in the event of a well control incident.

### Environmental Management

With over 40 years of experience, Wild Well's environmental management services deliver industry-wide pollution control solutions from wellbore to pipeline to well storage to commodity transportation. Its comprehensive environmental advisory approach encompasses prevention, mitigation, and recovery stewardship to deliver environmental restoration and effective cost control in the event of a pollution incident.

Wild Well is based in Houston, Texas, with offices in eight other major cities. The company has successfully capped hundreds of wells worldwide in all kinds of operational environments.



## Interwell: Enhancing Oil and Gas Recovery for Upstream Companies

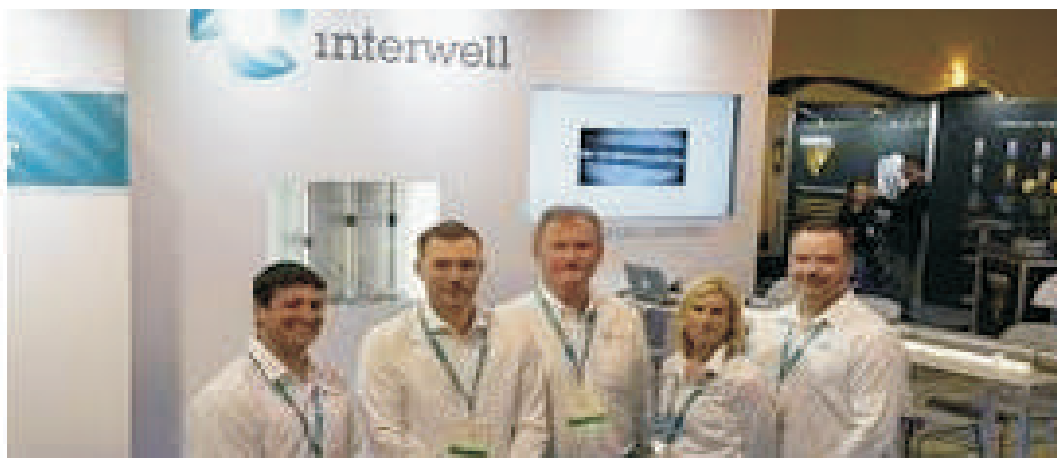
**E**stablished in Norway in 1992, Interwell, has become an international service company providing technologies from wellbore construction right through plug & abandonment. The company take on well challenges to ensure enhanced oil and gas recovery from new to mature assets for global upstream energy companies. Full service operational bases established in Norway including headquarter in Stavanger, and engineering and research center of excellence in Trondheim. Operating units in Aberdeen, Dubai and Abu Dhabi, Muscat, Oman, Kuala Lumpur, Perth, Houston and Anchorage.

Since 2011, Interwell has expanded its global footprint from the Norwegian roots to build service operations and organisation in several major oil and gas hubs around the world. The company also support satellite operations from its main operational hubs to other emerging markets both for mature assets as well as for new field developments. Thus far, Interwell has and continue to provide products solutions in more than 35 countries worldwide.

Since 2012, Interwell has been working on a groundbreaking approach to permanent well abandonment of oil and gas wells. The goal of the project is to create formation-to-formation barriers across multiple strings of pipe using wireline as the deployment method. This technology has the potential to replace today's expensive and time-consuming practice of cement plugs. The technology development is per date (Feb 2019) focusing on Single Casing Solutions and have completed 16 plug settings in 11 different wells. Patents have been secured in Norway, Europe, Eurasia, China, USA, and is expecting similar approvals in other key countries.

At ONS 2018, Interwell won the ONS Innovation Award. Offshore Northern Seas (ONS) was launched in 1974 as one of the world's leading energy industry event. With over 40 years of history, ONS is a biennial Exhibition, Conference, and Festival, making it one of the industry's key global meeting place.

Interwell has launched a product known as Matrix Platform Plug (MP), a new



plug series. It is a short plug with a relatively small element expansion and is meant for applications above well restrictions. It is qualified according to the ISO 14310 international standard. This cost effective bridge plug has over 20 years innovative experience applied to its design.

In the North sea oil and gas, there was a requirement for both a deep and shallow bridge plug to secure the well prior to performing the required top side A-annulus maintenance to check the integrity. The well history showed scale present above the downhole safety valve and the potential for debris further downhole.

Interwell proposed to run a deep 420-550 HPHT retrievable bridge plug with a top junk basket to prevent debris from entering the plug. The HPHT plug and junk basket were both set with the 3.50" Electronic Setting Tool (EST). For the shallow plug, Interwell proposed to use its new ISO VO certified 572-700 Matrix. The Matrix is short in length and was mobilized pre-assembled to the EST. It is ideal for shallow-set applications where a simple and cost-effective bridge plug is required to perform top side maintenance or repair.

For this application, the client needed a simple plug to be set and pulled on wireline. The Matrix is a cost-effective solution for shallow plugs and further time and costs were saved by preparing the EST and

Matrix onshore.

Another interesting innovation from Interwell is, Medium Expansion Retrievable Bridge Plug (ME), a high performance bridge plug /packer which features a solid elastomeric element, a robust anchoring module and an internal junk extension. This technology is ideal for workover applications; well control barrier, packer for injection valve, fixed choke, slim design (small OD/large ID), equalize and retrieve with standard GS in a single operation (no prong required). It can be run on slickline, e-line, coiled tubing and pipe.

Interwell offers a wide range of solutions across the lifecycle of any oil and gas field - from Drilling & Completions, Wellbore Interventions through to Plug & Abandonment operations. As a solutions innovator, Interwell is bringing to market cost-effective, next generation systems meeting the developing requirements in both the Plug & Abandonment and Unconventional markets. The company's products conform to the standards established by the International Organisation for Standardisation - specifically ISO 14310 / API 11D1 V0 for bubble-tight seals. Stringent validation testing confirms that Interwell products provide gas-tight barriers under a wide range of high temperature, high pressure, high mechanical expansion, and high impact conditions.



# Welltec: Providing Well Intervention Tools for Oil and Gas Industry Worldwide

For more than 20 years, Welltec develops and provide well technologies for the oil and gas industry. The company has a unique technological solutions that was developed and delivers game-changing solutions to its prospective clients. Welltec have proven to its customers that higher recovery and safer, more sustainable operations can be accomplished without increasing costs.

The story of Welltec began with one man's vision and has so far resulted in a multinational company with more than 1000 employees. The founder of Welltec, Jørgen Hallundbæk, invented the Well Tractor as part of his thesis from The Technical University of Denmark back in 1987. Although the rest of the industry was less enthusiastic about his groundbreaking technology Jørgen Hallundbæk had an indomitable belief in his idea and in 1994 he established Welltec. This commitment to innovation still permeates Welltec and it strive to constantly reinvent the industry and improve existing practices.

Since 1996, Welltec have received a number of industry awards for innovative thinking and for pushing the limits for what can be done technologically. Some of the featured awards include;

- The Welltec® Annular Barrier won the OTC Spotlight on New Technology Award in 2015
- The Welltec® Lateral Intervention Tool (WellLit) won the ICoTA Intervention Technology Award in 2014
- Welltec won Best Custom Build of the APPEA 2014 Exhibition
- For the third time Welltec won the OTC Spotlight on New Technology Award in 2013
- The Well Cutter also won the ICoTA Intervention Technology Award in 2013
- The Well Cutter also won Mediehuset Ingeniørens global award in 2012
- At Offshore Northern Seas (ONS), Welltec won Best stand >50m2 award in 2012
- Welltec won the entrepreneurial prize "Owner-Leader of the year" award in 2011
- Welltec also received the OTC Spotlight on New Technology Award for its Well Cleaner® PST technology in 2009
- In 2008, Welltec were awarded the



ONS Innovation Award and OTC Spotlight on New Technology Award for its Well Cleaner® RCB technology

- Welltec won Woelfel Best Mechanical Engineering Innovation Award for its Well Miller® technology in 2007

- In 2005, Welltec received World Petroleum Council Meritorious Award for Technical Excellence

- While in 2003, Welltec are awarded Woelfel Best Mechanical Engineering Innovation Award for its Well Stroker® technology

- Welltec proudly received King Frederik 9th Award for Excellence in Export in 2002

- Welltec received Gazelle of the Year award in 1999, and also won a Special Meritorious Award for Engineering Innovation same year

- Welltec won Woelfel Best Mechanical Engineering Innovation Award for its Well Tractor® technology in 1998

- Lastly, in 1996, Welltec received the Petroleum Technology Transfer Council Award

Welltec is truly a solution-driven company that develop and apply field proven technology to address the challenges of tomorrow's needs. It is the company goal to continuously push the boundaries of conventional oil field technology to their limits.

The solutions are based on clean technology and a determination to enhance personnel safety and health while reducing the environmental risks, fuel consumption and carbon footprints.

When it comes to Completion & Well Intervention, Welltec develop and deliver solutions which enable its clients to optimize their oil and gas production and increase reservoir drainage. This is accomplished in two ways; a completion philosophy focused on minimizing reservoir uncertainty and maximizing production from new wells and a well intervention portfolio dedicated to reliable yet novel approaches to overcoming well challenges in existing wells.

Welltec's latest development, the Flex-Well, is analogous to horizontal drilling for what it can bring to the oil and gas industry. Applying a holistic, open technology approach with new technology provides benefits through the whole cycle of the well; from drilling and completion, through production to abandonment. The Flex-Well® provides the opportunity for the operator to diversify his capital expenditure either through reduction or by maintaining and drilling more wells. Capex can be reduced per well due to: smaller rig sizes required, fewer rig days to drill and complete, less services needed, comprehensive yet simple completion hardware, and fewer platforms required

Welltec's headquarter is located in Denmark with offices and operations in North America, Latin America, Europe, Middle East, Africa and Asia.



# TIOS: Light Well Intervention Service Provider

**T**IOS UK LIMITED (former Island Offshore Subsea, jointly owned by TechnipFMC and Island Offshore) is the Group's global entity that perform all vessel based Light Well Intervention (LWI) services ranging from; Riserless Wireline based intervention (RLWI), Riserless Coiled Tubing (RLCT), Plug & Abandonment (P&A), Pilot hole / top hole drilling, Downhole Technology. The company have the following resources onshore to efficiently execute and plan the operations for project management, engineering, HSE/QA and risk management, offshore Operational management

TIOS has a track record of approximately 600 subsea wells, resulting in significant increased production from many of these. And, the company also provide products and services with focus on Increased Oil Recovery (IOR) through the use of Light Well Intervention (LWI). The operations are performed from a monohull vessel and via specialized downhole tooling. TIOS operate 3 Light Well Intervention (LWI) vessels designed and built for maximum efficiency and operability.

Globally, there are more than 6000 subsea wells, and the number is increasing. These wells are getting older, resulting in the need of well interventions to maintain production or integrity. A drilling rig performs the well intervention, while, TIOS perform Light Well Intervention (LWI) services from a monohull vessel, and its intervention services provide: lower carbon footprint per operation, improved operational efficiency per well, and cost reduction per day

TIOS major aim is to provide innovative solutions with minimum environmental impact, by implementing new methods and improving existing services. The company also provide engineering services, project engineering, project management, design engineering and FEED studies for a range of additional products and services.

In 2011, TIOS established a down hole technology company; Agat Technology. The aim of Agat Technology is to make it possible to expand the services provided on the LWI vessels today.



Agat Technology is set up to do mechanical, electrical and systems design. They will do both new technology development and make improvements on existing tools and systems. The company consists of experts with long and broad experience from tool-design and fabrication.

In 2018, The Group, TechnipFMC, signed an agreement with the Island Offshore group to acquire a 51% stake in Island Offshore's wholly owned subsidiary, Island Offshore Subsea AS. Island Offshore Subsea AS provides Riserless Light Well Intervention (RLWI) project management and engineering services for plug & abandonment (P&A), riserless coiled tubing and well completion operations. Island Offshore Subsea AS employs approximately 80 staff.

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

TechnipFMC is a global leader in subsea, onshore/offshore, and surface projects. The company's

technologies and production systems, integrated expertise, and comprehensive solutions, is transforming its clients' project globally.

Island Offshore operates a modern and versatile fleet of 25 advanced and high quality service vessels for the offshore oil industry. The company has taken a leading position within attractive market segments such as platform supply, anchor handling, walk-to-work, well stimulation, subsea construction and light well intervention.

The main office of Island Offshore Management AS is situated in Ulsteinvik, Norway, while subdivisions in Stavanger, Norway, and Aberdeen, UK, supports LWI operations. In addition a crewing department is established in Lisbon, Portugal. The fleet works on a worldwide basis.

TIOS UK LIMITED, is based in Aberdeenshire, UK, with approximately 150 employees, working onshore and offshore. The company offer long term job and development opportunities. TIOS goal is to support the client's need for increased production and a prolonged life cycle of the well, combined with offering a more time effective method to a significantly reduced cost.

TIOS has developed a close relationships between seafarers and the onshore organization worldwide.



# Expro: Providing Well Flow Management Services for the Oil & Gas Industry

**E**stablished in 1973, Expro is an exciting, international oil and gas service company, specializing in well flow management, headquartered in Reading, United Kingdom. The company empowers its employees to deliver the highest standards of service quality, safety and innovation. The company also provide services and products that measure, improve, control and process flow from high-value oil and gas wells, from exploration and appraisal through to mature field production optimisation and enhancement.

With a specific focus on offshore, deepwater and other technically challenging environments, Expro provide a range of mission critical services across three key areas: Well Test & Appraisal Services, Subsea, Completion & Intervention Services, and Production Services.

Expro's 40+ years of experience and innovation empowers the company to offer tailor-made solutions for customers across the energy sector. With over 4,100 employees in over 50 countries, Expro offers a truly global service solution.

In previous years, Expro secured a multi billion dollar well testing contract in UK North Sea, worth \$5million/£3million. The company was awarded a five year contract extension for surface well testing services across several assets for an operator in the UK North Sea. The \$5million/£3million contract includes the clean-up of existing wells and the testing of a series of newly drilled wells.

Expro has a strong heritage and reputation for well testing services in the UK North Sea, and is a global market leader in this area - alongside our broader portfolio of subsea, completion, intervention and production services.

As part of the company's effort to improve its services, Expro, enhanced its cased hole services offering, by signing a global agreement with downhole video and camera technology specialist Vision iO. Expro is recognised as a key provider of reliable downhole video technology to the oil and gas industry through its downhole video (DHV) range.

This includes the ViewMax, high temperature and standard memory cameras. The company's suite of camera technology is successfully deployed in wide range of operations including casing and well integrity monitoring, downhole inspection, operational verification and production monitoring for both on and offshore wells globally.

Vision iO's fish eye colour camera technology visually logs the whole well in one seamless high resolution image, providing a 185/360° view of the entire wellbore.



This is achieved without switching from front to lateral view, supported by a large internal 128 GB storage capacity - allowing 24 hours continuous recording.

At Offshore Technology Conference (OTC) 2018, Expro, received Spotlight on New Technology™ award in Houston. These awards highlight the best technological innovations from businesses around the world, which Expro has received for its Next Generation Landing String (NGLS). This in-riser well intervention technology meets the integrity, compliance and robustness required of landing strings under the new upcoming API 17G 3rd edition, while also delivering the time and cost efficiencies demanded in today's energy industry.

The NGLS comprises a five-phase programme of work to deliver a complete landing string package, including a range of new functionality across its 7 3/8 valves. It incorporates a high debris tolerant ball mechanism and hydraulic latch mechanism, dual seal protection for both environment and control systems, increased cutting capability, and a fail 'as is' retainer valve with the ability to close after a blowout preventer shear scenario.

Same year, Expro, won a fifth President's Award in the RoSPA (Royal Society for the Prevention of Accidents) Occupational Health and Safety Awards 2018 - building on 13 consecutive years of awards from this key industry organisation. One of the most significant contributing factors to Expro's latest success was the development of the bespoke investigation toolkit, "Intelligent Investigation". It is utilised in order to investigate accidents, near misses and quality failures, providing a robust process that enhances the safety improvement cycle within the company. This latest award is exclusively presented to organisations that sustain the highest standards of health and safety

management and innovation over consecutive years. It recognises Expro's continued success in safety, including its robust Management of Change process that risk assesses and mitigates the potential for failure when introducing change into any operation or activity.

Recently, Expro, has strengthened the opening of its new purpose-built facilities in Baku, winning a four-year contract extension for BP's Shah Deniz Stage 2 project. The contract extension will see Expro continue its provision of subsea landing string equipment and services to the project in the South Caspian Sea. In 2014, Expro secured a five-year contract for the project, providing its Landing String Assembly - High Pressure (ELSA-HP) 15k valves in conjunction with its EXPRESS electro hydraulic control systems. These are designed to ensure the highest standards of safety and reliability for the most challenging deepwater market conditions.

Expro invested \$5million at the facility which will house 30 employees, encompassing both office and workshop space over 8,500 m2. It will allow Expro to provide integrated subsea services to clients in the region, with the capacity to expand further core areas of the business.

Another major deal the company secured was with Weir Oil & Gas Dubai in December 2018. Expro will provide authorized repairs, specifically for Expro's PowerChokes® product range. The Authorized Repair Facility agreement will see Expro customers send PowerChokes® products to Weir Oil & Gas Dubai's facility to capitalize on Weir's Original Equipment Manufacturer repair and recertification status.

Expro's global well test operations are run from Great Yarmouth and Aberdeen (UK), alongside regional hubs in North and Latin America, Sub-Saharan Africa, Asia, the Middle East and North Africa.



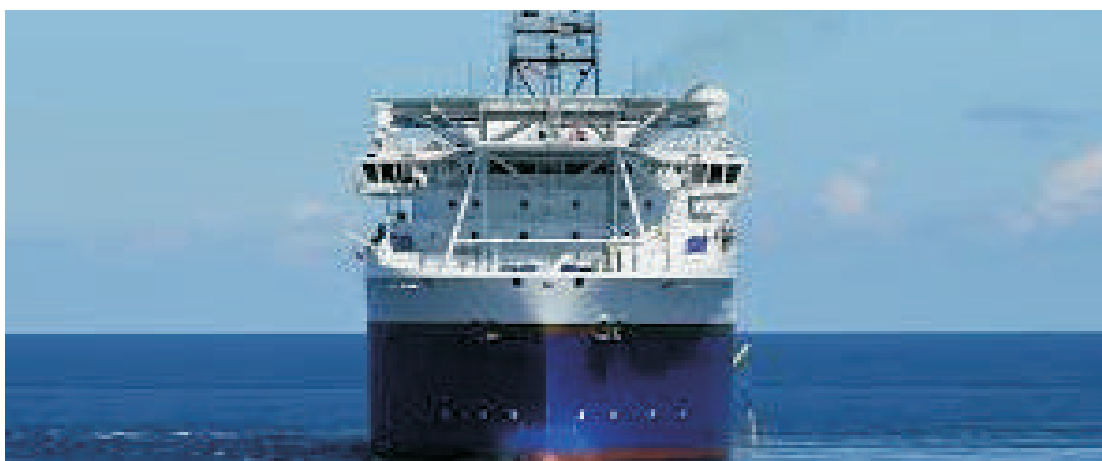
## FTAI: Provinding Offshore Marine Services to E&P Companies and Major Industries

**F**TAI Offshore provides offshore marine services to the International Offshore Oil & Gas Exploration and Production, Submarine Cable and Offshore Renewable industries. FTAI Offshore's base of operations and facilities is located in Singapore, with regional offices in Kuala Lumpur. FTAI Offshore is headquartered in New York.

FTAI have acquired and developed over \$17 billion of infrastructure assets, with an extensive working experience in building and managing successful companies and projects. The company also provide its clients with project management, engineering, and provide marine platform to support a wide range of service offerings including well intervention; SURF; offshore construction support; inspection, repair and maintenance (IRM); remote operated vehicles ROV's; diving and survey services.

FTAI Offshore operates a fleet of modern, DP-2 and DP-3 vessels that have successfully completed projects in Southeast Asia, the Middle East and West Africa, including: Well Intervention, Offshore Construction Support, Work- and Observation-Class ROV Operations and Support, Air and Saturation Diving Support, Umbilical Installation and Subsea Well Tie-in, Survey Submarine trenching.

When it comes to offshore vessel, FTAI owns The M/V Pride, an advanced DP-3 SURF / IMR vessel with one of the largest deck spaces and power generation offerings in its segment. Built in 2014 with an overall length of 130 meters and breadth of 28 meters, the Pride offers 2,000 square meters of deck space and 6,000 tons of cargo carrying capacity. The Pride has a 250-ton active heaving compensating (AHC) subsea crane, an auxiliary 35-ton crane, and can generate 21 megawatts of power to support many operations simultaneously. The Pride contains two ROV hangars, and a dedicated ROV control room.



The Pride has underdeck carousel room for flexible and small-diameter rigid pipe-lay work, and a 7.2m x 7.2m moon-pool. The Pride can accommodate up to 100 people, including marine crew. Accommodation is configured in single and double cabins.

For cargo and marine services, FTAI also owns The M/V Pioneer, a DP-2 ROV and Dive Support vessel with approximately 700 square meters of clear deck space. The vessel was built in 2011 with an overall length of 82 meters and breadth of 20 meters and offers approximately 1,000 tons of cargo carrying capacity. The Pioneer has a 50-ton constant tension crane, and accommodation for 120 people, including marine crew. The Pioneer also contains a 5.4m x 5.2m moon-pool.

For offshore services, FTAI owns The Subsea 88, a DP-1 offshore support, towing, anchor handling vessel with fire-fighting capabilities. The Subsea 88 is designed to provide support services to offshore platforms, rigs, and larger construction vessels. The Subsea 88 is capable of working in shallow and deep-water environments throughout Asia, West Africa, the Middle East and Mexico.

The vessel was built in 2010 and has worked primarily in Mexico for Pemex. The Vessel has accommodation for 30 personnel and is equipped with an advanced fire-fighting system and rescue boat to provide standby / emergency rescue services.

FTAI is known as a safe and professional offshore Marine Operator, and has developed a robust HSEQ management system that is dedicated for the safety of its employees. The company firmly believes the importance of safety, technical excellence and protection of its marine environment.

FTAI Offshore is wholly owned by Fortress Transportation and Infrastructure Investors LLC. FTAI is a global company that owns, acquires and develops high quality transportation equipment and infrastructure.





# OWI 2019WA ACCRA JUN 4-5

WEST AFRICA'S WELL INTERVENTION CONFERENCE

Network with West Africa's well intervention community and discover innovative and economic strategies that enhance well performance and encourage collaboration

150+  
DELEGATES

12+  
EXHIBITORS

30+  
SPEAKERS

## KEY THEMES

- THE PROGRESSION OF RLWI
- WELL INTEGRITY
- PRODUCTION ENHANCEMENT
- FUTURE OF WELL INTERVENTION
- VESSELS
- LOGISTICS & SUPPLY CHAIN

## SPONSORS



## SPEAKERS



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