

Seatrade Maritime

Middle East Offshore Market On The Move

Positive signals indicate better prospects for
battered offshore and workboat sectors



Foreword

Despite the current complexities of global geopolitics, energy prices have risen this year. Against a backdrop of significant volatility, energy majors are loosening spending constraints on exploration and production (E&P) and a range of recent contracts indicate that the sector has begun the road to recovery. Thanks to low breakeven production costs, Middle East producers are leading the way.

However, the depth and length of the offshore downturn means that the sector today looks very different compared with five years ago. Energy companies and contractors have focused on cost control as never before, facilitating huge reductions in breakeven oil production costs. This has major implications for workboat operators, both those employed directly at offshore oil installations, for example, and other service vessels which benefit indirectly from offshore energy operations.

Charterers of the many types of offshore support and service vessels, as well as other vessel types including dredgers, those involved in terminal construction and operation, landing craft and personnel boats will all be looking for the very highest specs available. They will aim to fix energy-efficient assets incorporating the latest technologies developed over the five years since the oil price collapsed.

Industry experts point to a new offshore industry structure in which service providers must adapt to a new lower-cost environment in which survival will depend on adopting the latest technologies. This applies as much to service vessel and workboat operators as it does to drilling companies who must adopt the latest techniques to do more with less.

Earlier this year, Oslo-based energy consultancy Rystad Energy reviewed the financial performance of 200 offshore energy contractors and found that aggregated quarterly revenue growth for companies involved in upstream oil and gas activities had registered positive growth for eight consecutive quarters year-on-year, the first time since 2014. The first quarter of this year proved sluggish, but positive year-on-year additions point to steadily improving market conditions, the consultant said.

The company also noted an upturn in drilling activity recently. This will benefit most mobile offshore drilling units in the jack-up and floater categories, with demand for the latter driven by new greenfield development projects in deeper waters. However, a significant upturn in national oil company activity in Gulf waters is also likely to bring some relief to owners of jack-ups and the vessel operators that service them.



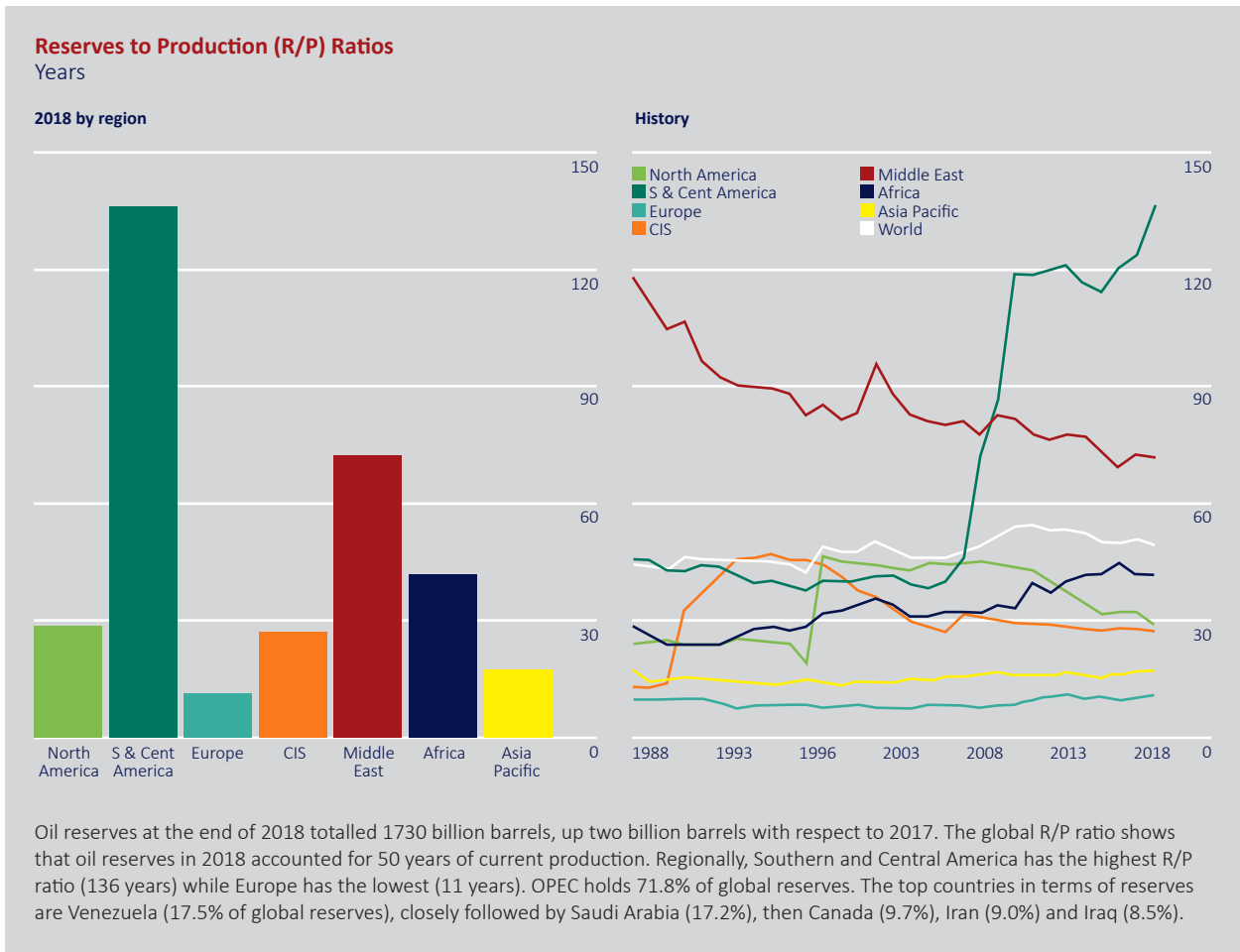
Introduction

However urgent the requirement to decarbonise global energy supplies, there is no short-term alternative to the use of fossil fuels including oil, natural gas and coal. Whilst all three fuels generate demand for shipping, the first two have major implications for offshore workboats of various types, as well as other more general types of service vessels including cable and pipe-layers, diving support ships, landing craft, dredgers, accommodation units and crew transfer vessels.

Writing in the recently published BP Statistical Review of World Energy 2019, Group Chief Executive Bob Dudley pointed out that the continuing rapid growth in renewable energy last year accounted for only one third of the required increase in power generation. He said that decarbonising the power sector while also meeting the rapidly expanding demand for power, particularly in the developing world, is perhaps the single most important challenge facing the global energy system over the next 20 years.

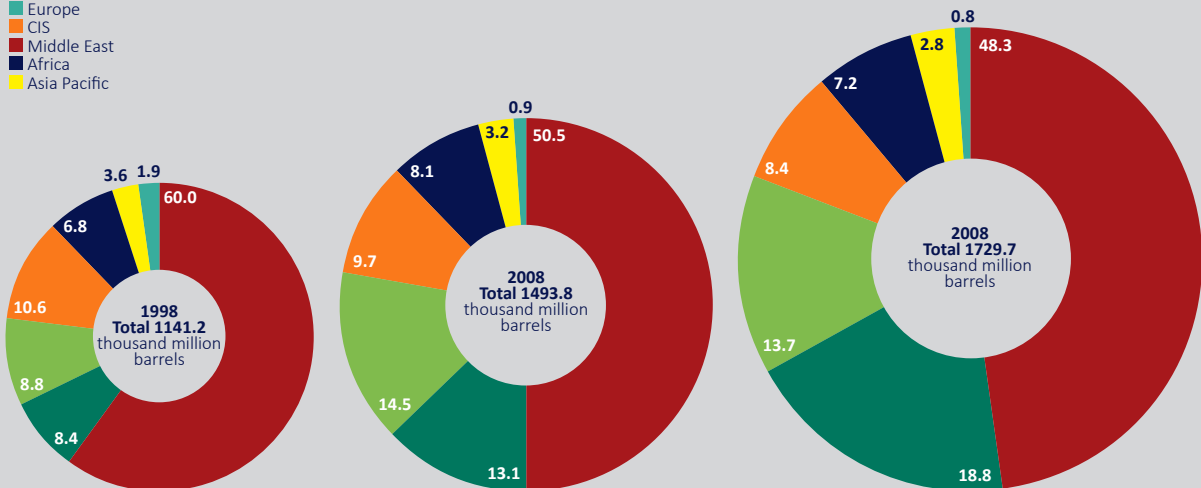
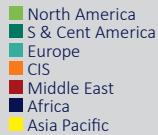
“Renewable energy has a vital role to play in meeting that challenge, But it is unlikely to be able to do so on its own. A variety of different technologies and fuels are likely to be required, including extensive, coal-to-gas switching and the widespread deployment of carbon capture, use and storage (CCUS). This is not a race to renewables; it is a race to reduce carbon emissions across many fronts.”

Bob Dudley
Group Chief Executive, BP



Distribution of proved reserves in 1998, 2008 and 2018

Percentage



BP Statistical Review of World Energy 2019

Key points from this year's Statistical Review of World Energy are as follows:

- > Primary energy consumption grew at a rate of 2.9% in 2018, almost double its ten-year average of 1.5%. This was the fastest rate of growth since 2010;
- > All fuels grew faster than their ten-year averages, except renewables. However, renewables still accounted for the second largest increment in energy growth;
- > Natural gas contributed more than 40% of the increase in energy consumption;
- > China, the US and India together accounted for more than two thirds of the increase, with energy consumption in the US expanding at its fastest rate in 30 years;
- > Oil consumption grew by 1.4m barrels a day (b/d) or 1.5%, with China and the US accounting for most of the growth. Oil production grew by 2.2m b/d and almost all of this net increase was accounted for by the US;
- > Natural gas consumption rose by 5.3%, the fastest rate since 1984. Growth was fastest in the US, China, Russia and Iran. Production rose by 5.2%, with almost half of the increase coming from the US;
- > The US recorded the largest-ever increases in both oil and natural gas production recorded by any country;
- > Trade in liquefied natural gas (LNG) was a key contributor to growth in inter-regional natural gas trades which grew by 4.3%;
- > LNG supply growth came mainly from Australia, the US and Russia while China accounted for about half of the increase in imports.



The Middle East Market

Heavily oil-dependent economies and budgets based on over-optimistic oil price forecasts have rocked the finances of a range of energy producers across the Middle East. The 2014 oil price collapse resulted in unprecedented budget deficits in some of the world's largest oil-based economies. However, compared to many other oil producing regions such as the North Sea, Gulf of Mexico and offshore Brazil, for example, breakeven oil production costs in the Middle East are low.

This, combined with the fact that many Arabian oil exporters have few other resources to underpin their economies, means that these producers have been amongst the first to increase offshore spending following nearly five years of massive cutbacks. Analysts point out that other higher-cost oil-producing regions now appear at an early stage of boosting exploration and production budgets but national oil companies in the Middle East are already well into this process.

There have, of course, been several years of corporate restructuring in the offshore structure, some from choice and some driven by distress, but more positive sentiment is evident. One recent transaction is a good example. DP World has committed to pay more than \$1 billion to buy Dubai-based Topaz Energy and Marine from Renaissance Services SAOG and Standard Chartered Private Equity / Affirma Capital.

Topaz, which has pursued a strategy of long-term commitments and weathered the offshore downturn better than most, still has a forward book worth \$1.6 billion. It operates 117 offshore vessels in the Caspian, MENA and West Africa regions. Relatively sophisticated vessels and a strong commitment to the Caspian are likely to have appealed to DP World which operates marine and inland terminals, P&O Maritime Services with a 300-ship global tug and service vessel operation with which Topaz will be combined, as well as other marine services including Drydocks World, one of the Middle East's largest repair yards.

Commenting on the deal, DP World's Group Chairman and CEO Sultan Ahmed Bin Sulayem, said: "In recent years, we have been investing selectively in the marine logistics sector in companies with high revenue visibility, consistent track record and strong customer relationships, and this acquisition complements the operations of our P&O Maritime Services, which maintains over 300 vessels globally."

MEED, a Dubai-based business intelligence and analytics specialist, has identified oil, gas and petrochemical projects currently under execution across the Middle East with a combined value of \$211 billion. Further projects worth an additional \$242 billion are at various pre-execution stages.



Some of these projects relate to onshore investments but, directly or indirectly, many also have implications for workboat operators. Virtually every energy project under development in the region, whether on- or offshore, will generate a vessel requirement in one way or another.

Some examples of energy-related projects in the Middle East include:

- > Saudi Aramco has awarded McDermott International the largest-ever engineering, procurement, construction and installation (EPCI) contract to boost production at the offshore Marjan field by 300,000 b/d. The contract is one of 34 new deals worth \$18bn signed by the national oil company recently relating to the Marjan and Berri fields where total output will rise by 550,000 b/d.
- > Production at Saudi Arabia's \$9 billion Jizan refinery and its adjacent marine terminal in the country's south west region is expected to begin later this year. Construction is being undertaken in two stages and is likely to be completed early in the next decade. Ultimately, products including fuel oil, petrol, liquid petroleum gas and bitumen will be exported to markets in Asia, Europe and the US;
- > Meanwhile, also on the country's Red Sea coast, development of the \$9 billion Petro Rabigh Integrated Refinery and Petrochemical Complex continues as Saudi Arabia drives diversity in its downstream oil and gas sector. Much of the chemical derivative production is likely to be exported to China and other Asian markets, generating significant shipping activity and workboat demand;
- > The \$18 billion Rehabilitation and Enhanced Redevelopment Phases of Iraq's Zubair oil field, one of the largest in the world, is being managed by Eni which plans to boost production from 195,000 b/d to around 700,000 b/d by the middle of the next decade. According to reports, Halliburton is to provide between four and six rigs over the next two years to drill development wells. These rigs will require significant marine support;
- > Abu Dhabi National Oil Co (ADNOC) subsidiary, ADNOC Refining, signed up John Wood Group PLC to provide preliminary front-end engineering and design for a new refinery to be built in Ruwais, in the Emirate's western region. The new refinery, with a nominal capacity of 600,000 b/d, will have a full conversion capability and will be designed for full integration with existing petrochemical infrastructure in Ruwais;
- > Kuwait is currently restructuring its oil refining sector. Following the closure of the elderly Shuaiba plant, the country's two existing refineries are being upgraded under the nation's \$12 billion Clean Fuels Project, and a newly built \$13 billion refinery is due to come on stream next year. The Kuwait National Petroleum Corporation is also considering a second new refinery which could take the country's crude distillation capacity to 2m b/d. Two new gas fractionation trains are also planned, taking the country's total to seven trains – four in operation today and one due on stream in 2020;
- > Local press reports say that the UAE's Brooge Petroleum and Gas Investment Company is planning to complete Phase 1 of the new Fujairah oil refinery by 2020. With an initial capacity of 250,000 b/d, it is understood that the refinery will focus on the production of IMO-compliant low-sulphur marine fuel oil to enable the Emirate to continue expanding its bunker supply services. A second phase in development of the refinery will take capacity to 600,000 b/d early in the next decade;
- > In April this year, Qatar Petroleum announced that it had issued invitations to tender for the engineering, procurement and construction of four LNG mega-trains at its North Field expansion project. The tender package was issued to three EPC joint ventures, according to report, including Chiyoda and Technip France, JGC and Hyundai Engineering & Construction Co; and Saipem, McDermott Middle East, and CTCI. The new production trains are part of the Gulf state's aim to raise LNG production from 77m tonnes per year today, to 110m tonnes by 2024;
- > LNG projects in Iran include the offshore South Pars Phases 13-14 and the giant Kish field which is located both on- and offshore with claims that the field is actually the world's largest offshore gas reserve. The development plan is based on three phases. The first relates to onshore production and phases two and three cover offshore development. However, in light of current geopolitical uncertainties, it is not clear whether these projects are proceeding on schedule or not. Total costs for these two projects are estimated at \$25 billion.
- > Meanwhile, Middle East-based workboat operators involved in projects outside of the region, notably Africa, often manage these activities from offices in the Gulf, supported by local management on the ground. Vessels are often mobilised in Middle East yards before being dispatched to foreign locations. Several new projects in West Africa are worthy of note including tieback activity in Angola, shallow water projects in Nigeria, and greenfield sites in Senegal and Mauritania. Meanwhile large gas reserves at the Coral South field in Mozambique are now being developed by Eni which cut the first steel for a floating LNG (FLNG) plant last September. The FLNG will be located in Area Four of the Rovuma Basin. Not only will it be Africa's first such facility, it will also be the world's first ultra-deepwater unit, operating at a depth of 2,000 metres.

These projects, together with offshore oil developments, will require a wide range of vessel types including, but not limited to, platform support vessels, anchor handlers, cable- and pipe-layers, trenching units, inspection, maintenance and repair (IMR) ships, subsea construction vessels, survey ships, accommodation units, fast crew vessels, security vessels, harbour, terminal and escort tugs, pilot vessels, landing craft and security ships.

Cost Control and the Impact of New Technologies

In the wake of the 2014 oil price collapse, all parties in the energy supply chain including national oil companies and energy contractors were forced to examine their cost structures and introduce efficiency gains wherever possible. In the first instance, this resulted in formidable cuts to the day rates of offshore and related service vessels. For many operators, these appeared unmanageable and, for some, they were.

There is no doubt that buoyant oil prices had enabled many energy majors to operate without close cost control, a situation that has since been carefully addressed. Nowhere has this been more evident than in Norway where state energy firm Equinor, with high-cost operations often in harsh North Sea environments, had relatively high breakeven prices prior to 2014. Since then, however, the company has implemented measures to cut costs and raise efficiency, with dramatic results on its breakeven numbers.

On its Johan Sverdrup field for example, one of the five largest reserves on the Norwegian continental shelf due to come on stream in November, Equinor's 2015 Plan for Development and Operation came with an estimated price tag of NOK 123 billion (\$14.4 billion). Today, this price is down to NOK 92 billion (\$10.7 billion). On Equinor's Johan Castberg project, the results are even more dramatic. The profitability threshold has fallen from more than \$80 a barrel to around \$35 today.

Regrettably, data on energy company's cost-cutting initiatives in Gulf waters is not available but there is little doubt that similar cost cutting and productivity-raising initiatives have been undertaken and, indeed, may now have become a permanent process. Whether or not national oil companies have been able to make the scale of efficiency gains that has been possible in Norway is impossible to say. What is absolutely clear, however, is that day rates for service vessels will be a key focus in the future and charterers will expect to be able to hire vessels with superior specs at competitive rates.

Amongst the likely demands from potential charterers will be stringent age limitations and other criteria such as improved uptime, fuel performance, operational flexibility, safety and reliability. This, in turn, casts uncertainty over the future of large numbers of laid-up offshore support vessels and other assets. In relatively shallow and usually benign Gulf waters, these vessels are usually of relatively standard design and many are now relatively old.

Meanwhile, since 2014, technological advances have transformed the operating efficiency of latest generation vessels which typically incorporate a range of features contributing to productivity gains and cost reductions. The significant tonnage overhang in Gulf waters is likely to favour the customer for some time to come, so vessel operators should be assessing ways in which they can raise the appeal of their existing assets and, if possible, consider new ones.

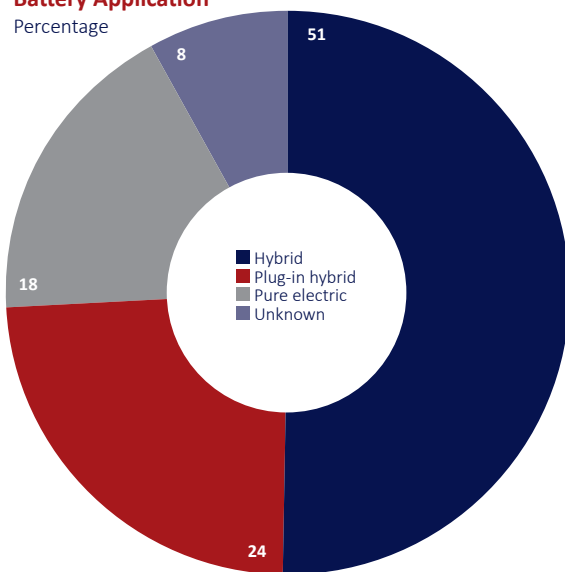


Preparing for the Upturn

Offshore oil developers have already spent several years assessing ways to cut breakeven oil production costs and these are well-documented elsewhere. However, vessel and asset operators now face a similar challenge if they are to market their services successfully. There are a range of exciting new technologies, some of which are so new that they are still relatively unknown. Here, we give some examples of cutting-edge developments, notably in Norway where the challenge of producing competitive oil in harsh environments from one of the highest cost bases in the world has been truly formidable.

Battery Application

Percentage



“Running machines at low loads creates a high amount of emissions for relatively little power when berthed,” said Sâtendal. With this solution, the generator can be shut down when the battery is charged. The battery is used until it is down to 25% of capacity and then recharged.”

Helge Sâtendal

Principal Consultant in Marine Supply Chain Management at Equinor

The Maritime Battery Forum, an Oslo-based promoter of battery-based power systems in shipping, estimated that 47 offshore support vessels, of which 28 are already in operation, are equipped with batteries. DNV GL estimates that a further ten offshore units – including construction vessels and drilling rigs – will be equipped with battery technology by 2020.

1. Batteries and energy storage systems

Vessels with wide-ranging load profiles are particularly well-suited to hybrid propulsion arrangements because batteries provide an additional source of power at peak loads and an effective alternative to running an extra genset in certain low-load operating modes, such as standby, dynamic positioning or on the berth. Battery technology is developing exponentially and there is now scope to install units on existing support vessels as well as incorporating hybrid systems on new ones.

In a recent paper, classification society DNV GL stated that offshore supply vessels can make fuel savings of 15-25%. It quoted Helge Sâtendal, a Principal Consultant in Marine Supply Chain Management at Norway’s state energy company, Equinor.

Demonstrating that retrofits are quite possible, Equinor signed contracts with five shipowners in June 2017. Seven supply vessels were involved and all had to be equipped with hybrid battery installations, as well as scope to connect to renewable electricity from shore. The energy firm is planning to have a “green clause” in all charter contracts over time. Energy major Shell has also taken a proactive approach to batteries, realising fuel savings of 12-30% when applied to peak shaving and spinning reserve. The company has developed its industry standard BOB – battery on board – consisting of two parts. The BOB box is a 20-foot ISO-footprint container equipped with batteries and battery management systems, suitable for installation on different vessel types. The BOB power management system (PMS) with transformers is installed and integrated in a shipyard.

Bo Jardine, Shell’s Global Category Manager – Marine, confirmed to DNV GL that Shell will grade owners against efficiency. “The more efficient vessels will win the contracts,” he said, pointing out that owners get about 30% of the benefit of battery hybrid conversions. A standard energy storage system, such as Shell’s BOB box could be accessible for everyone.

2. Connectivity

Advances in broadband satellite communications now mean that many aspects of vessel operation can be automated, including predictive maintenance technologies, performance monitoring, voyage optimisation and, of course, ship-to-shore communications. This heralds a completely new era in which offshore assets can become extensions of shoreside operations, with interactive communications and support available via new technologies including virtual reality and augmented reality.

A number of original equipment manufacturers offer remote diagnostics services and a wide range of applications are now available as part of services from communications providers including Inmarsat, Iridium, Marlink and Thuraya.

Meanwhile seagoing personnel, many of whom have grown up in a fully connected world ashore, can now maintain contact with friends and family, undertake distance learning and stay current with sport events and world news. Happy shipboard personnel perform more effectively and contribute to a safer and more productive shipboard operation, experts say.

3. Simulation

Computer processing speeds and the ability to simulate marine and offshore scenarios in real time is a transformational technology – “virtual prototyping” – that can lead to project cost savings of 20-30%. At the Offshore Simulation Centre (OSC) in Aalesund on Norway’s west coast, probably the world’s foremost facility of its type, complex offshore and subsea operations can be modelled in real time and personnel trained in advance to prepare them for any eventuality in the actual process.

The facility’s clients consist of an impressive list of offshore heavyweights – Aker Solutions, BP, ConocoPhillips, DNV GL, Equinor, Island Offshore, Rolls-Royce Marine (a shareholder in OSC now owned by Kongsberg Maritime) and Technip.

Virtual prototyping is the modelling of real-life processes so that personnel can prepare themselves through situation assessment, awareness, execution and “what-if” scenarios, all without risk. The OSC’s powerful simulators can now be programmed to model complex offshore operations above or below the water in a matter of hours, so that offshore personnel can undergo training ahead of time. Hook-ups, tiebacks, complex subsea construction, ROV operations, IMR procedures and the ship-to-rig transfer of heavy components in a variety of weather conditions can all now be accurately modelled.

Clients of the OSC often return with repeat business, having seen the benefits of careful preparation. They are well aware that between 80-85% of accidents involve human error. About half of the time, human beings cause the error, and in another 30% of cases, they are associated with it, usually because they lack situational awareness or the ability to make the right decision on the spur of the moment.

The OSC’s technology has developed at record pace since the 2014 oil price crash. Never before has it been more important for energy companies, contractors and offshore asset operators to save time, cut costs, reduce downtime and improve safety and efficiency.



4. Safety

Faster processes and more effective personnel are major contributors to improved productivity and lower costs, but safety still lies at the core of industrial processes, particularly in an offshore context. For energy majors and their contractors, the safety systems adopted by vessel operators are a very top priority.

Digitalisation and connectivity have enabled the development of new technologies which see assets, both on shore and at sea, constantly monitored and even controlled from operation hubs ashore. Original equipment manufacturers including ABB, MAN Energy Solutions, Rolls-Royce (now part of Kongsberg Maritime), Wärtsilä and WinGD all track assets around the world every minute of every day.

There are new technologies available, however, which are differentiators. One of these has been developed and launched recently by Norwegian company ScanReach: the company's breakthrough technology enables sensor-based data to be transmitted through steel for the first time.

The company launched its technology, which has different applications across the marine and offshore sectors, earlier this year and it has already generated great interest, notably from offshore operators and charterers. The system is already installed on board one of the world's most complex offshore subsea construction vessels, the North Sea Giant, using the company's In:Range product to track and monitor about 120 persons on board, comprising crew and contractors. The system was installed across the vessel in a matter of hours, with no time-consuming and costly cabling. No time out of service was required.

The ScanReach wireless technology is based on a combination of frequency control, sophisticated algorithms and protocols which monitor the location and welfare of individuals on board ships or rigs, the conditions prevailing in hard-to-access void spaces and compartments, and the location of mobile assets and plant. The networked system can also be used as a basis for third-party sensor data to be transmitted through steel to a control room on board ship or a remote location ashore.

The sensors, which can be set up to monitor a range of variables, are relatively inexpensive and integrated one with another in a meshed network. If one sensor stops working, adjacent sensors note the failure and alerts are automatically sent to the appropriate control centre.

The company's In:Range product is designed to track and monitor persons on board. Company personnel and contractors based on an offshore rig or support ship wear 'tags' equipped with microsensors which enable them to be tracked in all locations of the rig or ship. The microsensors have an accelerometer function, providing alerts if someone is overcome by smoke or falls down a hatch. In an emergency, their location on board and their physical condition are clear to controllers and any absences at muster stations are evident and can be immediately addressed.



North Sea Giant