

SEN

SUBSEA ENGINEERING NEWS

(with DEEPWATER INTERNATIONAL)



ONESUBSEA SHOWS ITS HAND WITH HYFLEX TREE

From OTC 2015, Houston: Moves by the main hardware manufacturers to steer away from the traditional ‘vertical’ and ‘horizontal’ subsea trees have been on the agenda for some time and OneSubsea put a spotlight here on its HyFleX tree, billing it as offering the benefits of both types.

The HyFleX system has the tree and the tubing hanger as two separate units in parallel rather than in series, meaning the tree and the tubing hanger are completely independent in their installation and in their recovery.

OneSubsea’s tree product manager James Stewart said, ‘The benefit of that is that all that equipment would be more easily recoverable if required.’

‘The HyFleX tree system offers greater benefits, more flexibility and reduced cost. It gives greater and optimised installation and recovery options by having the tree and the tubing hanger as independent units in parallel rather than in series. Because these units are separate you have a lower lift weight and they can be lifted individually rather than in one large assembly.’

The tree system comprises of three major components that integrate together – the tubing head spool which consists of the wellhead connector main body and valves and this forms the barrier on the wellhead.

This system is designed to be standardised. The tree module integrates onto the tubing head spool and it is the tree module which is designed to be configurable. This is where the project specific requirements can be accommodated. This module would contain hydraulically actuated valves, chokes, control systems, chemical injection metering, any monitoring, sensors – basically everything that would be in the tree.

All of the components of the HyFleX tree exist already, including the wellhead connector, the valves and the connection systems.

‘It is all field proven and already existing technology,’ Stewart added.

It is not surprising that the first ‘visible’ hybrid tree has come out of OneSubsea. In its previous incarnation as Cameron, 1-Sub was responsible for the two earlier important tree advances – the SpoolTree, otherwise known as the horizontal tree which came into the market in the early 1990’s and the all-electric trees which appeared in the mid-2000’s. Other manufacturers might dispute this view, but the Leeds plant has been a hub for new technology.

1-Sub’s figures suggest that the HyFleX tree could offer a \$10mn saving per well, which on a 10-well field would give a ‘significant saving’ of \$100mn simply by tree selection alone.

The company carried out a case study based on an operator in Malaysia with a four well development consisting of four trees, four inline sleds, jumpers connected to the sleds, jumper connections and pressure caps. The development has a flowline in a daisy chain arrangement linking each one of these together so the flowline can be installed independently of the tree with four inline tees.

Stewart said, ‘Essentially we can link the flowline into the tubing head spool on the HyFleX tree and the flowlines can therefore be installed completely independently of the trees.’

‘We have four trees as before but now we only have eight jumper connectors and eight pressure caps. We have saved four in-line tee sleds, four jumpers, eight jumper connectors and four pressure packs. For this field that was a 20% saving just in capex. That doesn’t include installation cost saving. That can be the difference often between a field being viable or not.’

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SHELL FIRMS UP ARCTIC DRILL PLANS

From OTC-2015 (BN): Shell's commitment to drill the *Burger* (32/2) prospect in the Chukchi Sea this summer is firm, assuming courts and regulators give final approval, executive veep Ann Pickard told an OTC luncheon.

Ms Pickard, who oversees Shell's Arctic operations, did not detail why the geology is so attractive despite depressed crude prices.

She told SEN on the sidelines that Shell does have a break-even dollars-per-barrel in mind, but she declined to share that number. The talk focused on long term growth in world oil demand and already apparent output slowdowns in traditional oil-rich areas.

The Shell exec cited government estimates that billions of barrels of oil remain undiscovered in the Arctic. Long term supply-demand imbalance will lead to higher prices which is why Shell is proceeding in the face of opposition from environmental advocates and some local officials.

Ms Pickard brought along Rex Rock, an Alaskan native official and Inupiat business and political leader, who leads a native company partnering with Shell to develop *Chukchi* without damaging the environment.

Shell is positioning equipment and resources in the Seattle area to move through the Bering Strait in July after break-up of sea ice. The company plans to use two rigs to drill six wells before the return of sea ice in November. *Burger* is in 43m about 113km northwest of the village of Wainwright.

(NB: The Bureau of Ocean Energy Management this week approved Shell's overall exploration plan, conditional on receiving permits from all other relevant state and federal agencies. Shell still awaits permits for each well from



Shell is waiting for Bering Strait ice to break up

the Bureau of Safety & Environmental Enforcement, but the company says those approvals often come late and it expects them to be granted.)

Ms Pickard was asked about a recent development – a demand from the mayor of Seattle that the city's port obtain a new land-use permit before letting Shell base Alaskan operations there. She said Shell has a backup plan if the mayor succeeds in blocking use of the port.

Environmental groups are now pushing the US Securities & Exchange Commission to investigate Shell for allegedly misleading investors about Arctic risks which seem clear enough, at least to SEN.

Ms Pickard's long term view of the need for oil from the Arctic received support. At another OTC luncheon presentation, Bob Fryklund, chief upstream strategist for IHS, agreed global demand for oil will soon outstrip supply without production from frontier areas. His focus was deep water, but his message to his audience was the same. There may be an oversupply of oil now, but it will be temporary.

BRAZIL LICENSING ROUND TO LAUNCH IN OCTOBER

From OTC-2015, Houston: Brazil's 13th licensing round will kick off in October this year, Eduardo Braga, Minister of Energy & Mining, told delegates at OTC in Houston.

Braga said the round under the concession model will launch with 269 onshore and offshore blocks going under the hammer.

The blocks are in a mixture of mature plays, new frontiers and high potential basins.

In the offshore areas, 10 blocks will be offered in the Sergipe/Alagoas basin, four in Jacuipe and nine in the Camamu-Almada basin.

There will also be seven blocks offered in the Espirito Santo basin, three in the Campos basin, and 51 in the new frontier Pelotas basin. The remainder will be onshore.

Braga also said that Brazil 'hoped' to be able to establish a second bid round under the production sharing model between 2016 and 2017 and the blocks are currently being 'carefully' selected for the round in the pre-salt of the Campos and Santos basins.

'The Brazilian oil sector offers a good opportunity to invest and there are already 110 companies working in

exploration and production of oil,' Braga said.

The three biggest discoveries made in the last 10 years have been in Brazil at *Lula*, *Libra* and *Buzios*.

Braga highlighted the size of opportunities available in the country and said that currently 20% of the world's fpsos are operating in Brazil, while 46% of fpsos and platforms currently under construction are destined for the country.

'Some 40 new fpsos will be operating in Brazil in a few years' time, 24 in the *Buzios* and *Libra* fields alone,' the minister said.

In the last five years, 36% of oil discovered worldwide has been in Brazil, amounting to some 22.9bn bbl with 63% of the deepwater discoveries in the last five years also made in Brazil.

There are no restrictions on oil exports from the country and more than 500,000b/d were exported in 2014 by 17 companies as well as Petrobras, which was responsible for 45% of exports.

Braga also acknowledged that Brazilian oil giant Petrobras is facing serious challenges after it was hit by a corruption scandal, but said it had the 'full and unconditional' support of the government.

LOCAL CONTENT IS KEY TO CLOV

From OTC-2015, Houston: Local content reached an all-time high on Total's CLOV (SEN, 32/2) project, offshore Angola, with many of the key fabrication jobs being carried out in country, delegates at OTC 2015 were told.

Some 25% of the overall budget was targeted to be spent in Angola, with half of the work on the SURF package carried out locally.

CLOV comprises the Cravo, Lirio, Orquidea and Violeta fields and is Total's fourth large deepwater development in golden Block 17. As with the previous three, it is based around an FPSO and an extensive subsea production system. Production started in June 2014 with capacity of 160,000b/d.

CLOV project manager Francois Bichon said, 'Local content is a necessity and part of our unwritten contract with the country. You have to know and be able to demonstrate what is achievable and what is not realistic. It was deemed feasible to achieve 10 million man hours in Angola. That was three times more than on our previous project at Pazflor.'

'For this to be achieved, it would require a large extension of Angolan yards and in particular Paenal, which was to berth the first FPSO in Angola for integration work.'

The aim was to fabricate 64,000t of structures in five domestic construction yards, and Bichon said it was essential to ensure that yard development and manpower recruitment remained on schedule, while Total also initiated an innovative training programme for the project.

For the SURF package, fabrication and assembly of production and water injection lines, the gas export line as well as riser towers was carried out at the Sonamet yard in Lobito. Fabrication of umbilicals was done at Angoflex in Lobito.

The SURF element of the project required three hybrid riser towers, nearly 100km of infield flowlines plus a 32km gas export line, while the subsea production system of 34 wells - 19 producers and 15 water injectors - is typical of systems employed by Total in West Africa.

The integration of one module for the FPSO was done at the Paenal yard, another first for Angola.

CLOV, in 1,100-1,400m, benefited from lessons Total had learned on its three earlier projects - Girassol, Dahlia and Pazflor.

The heavy oil reservoirs of Orquidea and Violeta need pressure and flow support and require the use of both



The CLOV FPSO at the Paenal yard in Angola

a large water injection scheme (six subsea water injectors) making use of produced water from the FPSO and the installation of a seabed multiphase pumping (mpp) system based on helico-axial pumps, former CLOV project director Genevieve Mouillerat said.

The application of the mpp system was also an element in the overall flow assurance programme and the cost reduction exercise on the project. Its use reduced the number of the looped flowlines with the furthest well at 15km from the FPSO.

The original plan for CLOV was to have 11 production wells and four water injectors at the time of first oil, but only nine producers were required to hit 168,668b/d on 2 October 2014.

The FPSO is a purpose-built unit of 305m by 61m with a topside of 37,000t. It can store 1.78mmbbl of oil. It uses an all-electric power system with variable speed drives and also makes use of the 'wash tank' technique for oil-water separation. Both are firsts on projects developed by Total.

Total (40%) operates Block 17 on behalf of Sonangol (concessionaire), alongside Statoil (23.33%), ExxonMobil (20%) and BP (16.67 %).

With a high gas oil ratio and a 'no flaring' policy, the topside is equipped with compression capacity of 6.5mcm/d.

Produced water (122,000b/d), which is used for injection purposes, goes through a multi-stage purification process. Treatment through two hydro-cyclones, operating in parallel, removes the last of the oil after which two de-sanding cyclones remove particles to 10 microns.

Seawater supplements produced water with the onboard lifting pumps capable of providing up to 1.4mmbbls/d. It is coarse filtered, then ultra-filtered to remove fine particles.

Power generation is developed through three aero-derivative turbo generators rated to produce 28MW each.

PUSH FOR STANDARDISATION CONTINUES

From *OTC-2015, Houston*: Standardisation was once again on everyone's lips at OTC.

Ian Silk, Shell's veep for deepwater projects, had some interesting input.

Every operator paints their subsea equipment yellow, but Silk said, 'When I talk to the fabricators there are 28 different operator specs out there for yellow and everyone has a different view on what that paint should be.' It's cheaper to paint everything white anyway.

Meanwhile, Amec Foster Wheeler's CEO Samir Brikho said the oil industry has been essentially 'lazy' in dealing with the need to increase levels of collaboration and standardisation.

Brikho told a breakfast panel, 'We have been speaking about collaboration for some time, but when operators have been talking about it, it all sounds OK until they place their order. It is the same the other way with the contractors, too.'

About \$500bn in capex will be spent in 2015 on an estimated 800 projects to extract about 60bnboe. According to Brikho, about \$150bn could be postponed and 'pushed to the right', meaning greater pressure on everyone all around.

'When the oil price was around \$10/bbl operators were making around a 10% margin, but when it was \$100/bbl they were still only making a 10% margin. Costs have gone up,' he added.

Lockheed Martin's Neale Stidolphe highlighted the aviation industry's use of technology to reduce costs and standardise today's aircraft.

'We have our Lockheed Martin F-35 Lightning II plane. It has a 50-year design life and costs about \$100mn each, but there are only three versions. Things like the cockpits in all three are the same. We do not re-engineer.



Subsea equipment comes in 28 different shades of yellow

That's the product, and we offer it for sale.'

According to BP's Ian Cummings, speaking at the International Oil and Gas Producers (IOGP) panel session, the benefits of standardisation are obvious.

His company, he said, was found to be spending between \$10-15mn per major project on essentially

recreating procurement specifications.

In one case, the company had two different projects ordering the same piece of equipment, with one project team issuing a document with 1,200 pages of specifications, while the other project issued 800 pages of specifications, he said. Both were different in terms of what their specifications were, despite them being largely similar projects, he said.

Cummings, who is vice president of engineering in BP Upstream's Global Projects organisation, outlined how the operator has worked hard to change that process as well as listened to feedback from its contractors. The benefits of standardising more of its specifications on similar projects are starting to show, he said.

These include reduced schedules with better predictability, a reduction in cost through removal of inefficiencies in how equipment is designed and procured, smaller operator engineering teams with the space to focus on optimising the design rather than generating new specifications, and the removal of preferential engineering.

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FORSYS TARGETS EARLY INTERVENTION

From OTC-2015, Houston: The top executives of FMC Technologies and Technip, which recently launched the Forsys Subsea (SEN, 32/1) joint venture, believe their planned earlier involvement at the design stage in offshore projects is the key to opening the door to faster adoption of new technologies.

John Grempe and Thierry Pilenko, ceo of FMC and Technip, respectively, stressed during a special presentation at OTC that being involved earlier in the field development process would help get new solutions into the market as well as being able to reduce costs.

'We have been frustrated by the lack of adoption of new technologies,' admitted Grempe. 'But with Forsys we can now be more involved. We expect our FEED group to help drive the pace of standardisation, for example.'

Pilenko added, 'When we develop these new technologies, we will be better positioned to have it adopted. At the moment, new technologies never get included at the early stage of a development. We feel with Forsys it will help in accelerating the pace at which it gets adopted.'

He also highlighted what he felt was an opportunity for operators to look at clusters of projects being considered for development in different basins around the world and prepare better standardised solutions to get the best specifications for the market.

'Is there an opportunity here to take that further?' he asked.

Alain Marion of Forsys stressed that in terms of R&D, the first phase for the company is focused on

how best to integrate the technologies of both parent companies. The next stage, he said, would be more focused on new equipment.

The heads of both parent companies started talking last summer about coming together to find a way to reduce subsea field development and operating costs, accelerate time to first oil and improve efficiency, long before the oil price began to fall. At the official Forsys launch in March, the company issued estimates including potentially being able to trim 25-30% from project capex by being involved in a development from the early stages.

Technip is putting up some of the resources of its front-end specialist Genesis, with FMC throwing in its FEED team as well.

Forsys is not, of course, only aiming at the front-end stage but also the full project life cycle, including maximising well performance and simplifying maintenance.

It's all about team work

Tie-ups seem to be catching these days and as well as the Forsys partnership between FMC Technologies and Technip, FMC also announced a hook up with Total at OTC to collaborate on technology development.

The aim of the agreement is to "enable an environment" where the parties can work together to tackle industry technical challenges and to reduce time to market for subsea technology.

The frame agreement will include joint projects and be managed by a steering committee.

OTC BRIEFS

Despite the doom and gloom surrounding the subsea industry, a new start-up company surfaced at OTC.

Houston-based **UNDERWATER INTEGRITY SOLUTIONS (UIS)** will focus on subsea integrity, production assurance and life extension for subsea fields.

HitecVision, the leading European private equity oil and gas investor, has committed \$150mn of equity to finance the build-up of the company.


UIS has been established by five well-known subsea industry leaders with over 140 years' combined global experience. UIS will acquire businesses - and form strategic partnerships - to build an independent and global company solely focused on integrity and production assurance 'with the aim of maximizing the operators' financial return on their subsea assets over their operational life.'

Bill Boyle, ceo of UIS, said, 'UIS is launching at a time when the trend for operations in deeper water and in more hostile environments is continuing. There are about 5,000 operational subsea wells around the world with almost 7,000 predicted by 2020.'

Subsea global annual operating expenditure is currently around \$10bn and is expected to grow strongly over the course of the next few years.

Boyle added, 'Our independence, global presence and sole focus on subsea integrity and assurance will be our competitive edge, differentiating UIS from what is currently being offered in the marketplace.'

UIS will have a leadership team on both sides of the Atlantic. In the Houston HQ, Boyle will work alongside coo Guido Bressani and cfo Mark Webster, while in Aberdeen, coo Neill Kelly and cto Geoff Fisher will take the reins.



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HAYWARD TYLER signed a production alliance with FMC Technologies at OTC, which will see it manufacture permanent magnet motors for use in FMC's 3.2MW subsea pump systems.

The deal includes an initial \$2mn commitment by FMC towards the on-going development of HT's Luton plant in the UK.

The company has also signed a \$1.25mn LOI for the latest order for four submersible motors for use in the *Baram* field in the Malaysian gulf as a result of HT's on-going agreement with Eureka and existing relationship with Petronas.

EXPRO has scooped a key contract offshore Canada with Statoil in the Flemish Pass Basin. The initial four-year contract is valued at \$45mn with options for two 1-year extensions.

The contract covers the provision of surface well testing and subsea safety systems, drillstem testing tools, tubing conveyed perforation, downhole sampling and on-site chemistry services.

Earlier this year, Expro announced a \$200mn contract with the big Norwegian operator providing fully integrated well testing and sampling services on the Norwegian Continental Shelf.

FMC has chosen DNV GL to perform independent third party verification of a hpht subsea completion, production and workover system.

FMC is running this project as a joint industry program (JIP) with Anadarko, BP, Conoco Phillips, and Shell, to aim at product standardisation and cost efficiency.

Producing oil and gas from deepwater reservoirs with pressures of up to 20Kpsi and temperatures of 350°F at the mudline has for years been the objective of taskforces of the best and brightest engineers within many of the oil majors' organisations.

The establishment of the JIP led by FMC shows an industry that is now pragmatically collaborating as a response to increasing costs and a falling oil price.

Petrobras has already reached oil output of more than 800,000b/d in the **PRE-SALT** off Brazil, a feat for which the company was handed the Distinguished Achievement Award gong at OTC 2015.

At a lunch presentation, E&P director Solange Guedes emphasised the financial viability of the pre-salt with a production cost of \$9/bbl.

'If we consider that two production units are not yet producing at their total capacity, the production cost will be even lower. Our operational efficiency of around 92% has contributed significantly to our reaching these low costs,' Ms Guedes said.

Average oil production in the pre-salt layer of the Santos Basin is now more than 25,000b/d. Five wells each produce over 30,000b/d. The *Sapinhoá* and *Lula* fields have wells whose average output may reach 40,000b/d.



The *São Vicente* fpso

'These figures will certainly contribute to a reduction in the number of wells in our future pre-salt projects, which will be a major benefit to cost reduction,' she said.

There are now 13 production units in the pre-salt, including the most recently installed fpso *Cidade de São Vicente*, which is undertaking an extended well test in the *Cessão Onerosa* area.

From Houston (BN): **PETROBRAS'** pre-salt output keeps rising. Brazil's state-controlled oil company reported that on April 11 production from the Santos and Campos basins reached 800,000 b/d. The single-day record was set with 39 production wells, 20 in the Santos Basin and 19 in the Campos. Nearly two-thirds of the total (511,000 b/d) came from wells in the Santos. Key to setting a new high in pre-salt production was start-up of a dynamic producer platform-ship in the *Buzios* field and start-up of platform *P-20* in the Marlim field.

The requirement for better **CONDITION MONITORING** of subsea pipes, risers and flowlines to avoid potential failures and the dreaded threat of downtime came under the spotlight at OTC.

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There are plenty of opportunities in particular for better monitoring of subsea risers. According to BPP-TECH's Tony Kenyon, there will be an inventory of between 1,950 and 3,090 subsea flexible risers between 2014 and 2021.

Kenyon outlined his company's efforts to develop an in situ radiographic inspection solution for non-destructive examination of subsea flexible risers. The Digital Radiographic Inspection of Flexible Risers Tool (DRIFT) is initially being used by Subsea 7 to inspect risers while in operation.

DRIFT is appropriate for at least three-quarters of the above forecast number of subsea risers, he said.

Dr. Vineet Jha of GE Oil & Gas Wellstream, highlighted that the use of composite reinforcement on unbonded flexible pipe for optimised hybrid designs could have major weight-saving benefits.

'In deepwater you could save up to 70% in buoyancy requirements,' which would also naturally reduce costs in deepwater applications as a result.

A project aimed at improving **FLOW MEASUREMENT** in deepwater projects is paying dividends, delegates at OTC heard.

The project, sponsored by research partnership RPSEA, is looking at technologies including a sampling system, subsea sensor and a subsea clamp-on meter.

Chip Letton of Letton-Hall Group said seven independent smaller projects have been brought together under one umbrella to address gaps in deepwater flow measurement.

'The deeper you get everything gets bigger, not only the impact of the problems but the cost to the environment, the cost to the stakeholders,' Letton said. 'Deeper water is just more difficult. Measurement is really the only way to understand this. You have really got to have some instruments to be able to understand what is happening on the sea floor.'

JIP partners including Chevron, ConocoPhillips, GE, Statoil and Total provided funding and expertise to the project.

Letton stressed the importance of the work saying that a meter that was not working accurately could fluctuate with readings as much as 2% higher or lower than they should be and that that could prove "catastrophic" for somebody, particularly in massive deepwater wells.

The JIP has investigated a means of being able to clamp a meter on the outside of a pipeline and use electromagnetic measurements to measure what is flowing through the pipe.

Work is also being done to check for subsea kicks by monitoring small changes in the mud density at the bottom of the mudline in wells.

'RPSEA and the Department of Energy gave us the bulk of our funding. For those of you who are US taxpayers and get disgusted at how your money is being spent, this is a good use of your money. It is a good model and worked really well,' he said.

DEVELOPMENT

NPD CALLS SVERDRUP PLAN 'OVER-AMBITIOUS'

From the North Sea (NT): The fate of the *Johan Sverdrup* (SEN, 31/23) development is now a matter for Norway's Storting (legislature), which has received a white paper from the Oil & Energy Minister Tord Lien recommending approval. Its decision is expected in June.

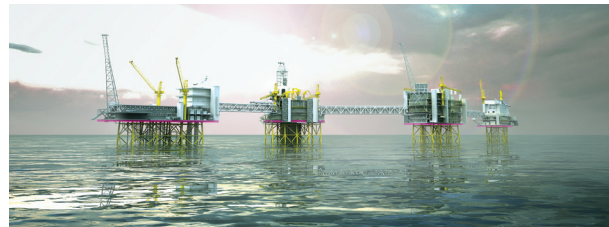
The project 'is the start of a new chapter in Norway's oil history' which will create revenue of more than NOK1tn (\$135bn) for the country over 50 years, Lien says.

The white paper reveals that the Norwegian Petroleum Directorate believes the plan for the first phase development is over-ambitious with regard to both schedule and budget.

NPD expects first oil six months after the licensees' December 2019 start date and a bill NOK10bn higher than the licensees' NOK117bn. It acknowledges, though, that its own estimates are within the margins for error set by the licensees. The pre-tax breakeven price is a reassuring \$32/bbl.

According to the white paper, reserves to be produced by the first phase amount to 1.86bboe, of which 95% is oil. Overall recovery is put at 2.3bboe. First-phase oil production will be 315-375,000b/d. A total of 35 wells will be drilled and water injection and gas-lift will be used.

The document notes the disagreement among licensees on the proposed unitisation. Det norske oljeselskap has dissented from the division agreed by the other four



The *Johan Sverdrup* field concept

companies and states that the ministry will decide the issue. Its ruling is to be given shortly before the Storting vote.

An NPD study of the resource potential in the Utsira High area where *Sverdrup* is located concluded that it was limited, despite some promising discoveries having been made.

Lundin's *Luno II* find to the south, for example, is looking less interesting following appraisal, and is currently thought most likely to be developed with subsea facilities tied back to the *Edvard Grieg* platform facilities. A plan for development and operation (PDO) could be submitted in 2017-19.

In describing the outlook for the Norwegian offshore sector as a whole, the white paper notes that the country's portfolio of discoveries consists of 91 finds with combined reserves of 4.1bboe; for 84 of them, subsea development is the most relevant solution. Twenty two are in the planning phase with another 34 at the stage of early studies.

WINTERSHALL ON SONG WITH MARIA

Wintershall is speeding ahead on Maria (SEN 32/2), its first operated development project off Norway, with the PDO submitted and contracts being handed out.

Maria, located in 300m in blocks 6407/1 and 6406/3 on the Halten Bank in the Norwegian Sea, is estimated to contain approximately 177mboe. Field start-up is planned for Q4 2018.

The field will be developed with a subsea production facility consisting of two four-slot subsea templates. Two producers and two water injectors will be drilled from each template using a semi.

The wellstream will be sent to the Kristin production semi for processing and metering. The stabilised oil will then be sent to the Åsgard A fpo for storage and offloading to shuttle tankers.

Rich gas will be exported via the Åsgard Transport System to Kårstø in Rogaland County. Gas for gas lift will be supplied from the Åsgard B semi via existing pipelines to the subsea template on the Tyrihans field. Here, the lift gas

pipeline for Maria will be connected. Water for pressure support will be supplied from the Heidrun platform.

Subsea 7 has been handed the \$300mn contract to design, procure and install three pipelines linking Maria to the surrounding fields. These comprise the 26km production flowline with DEH cable connected to the Kristin platform, the 46km plastic-lined water injection pipeline from Heidrun, and the 22km pipeline that will supply lift gas.

S-7 will also install the seabed structures supplied by FMC. This includes two integrated templates, subsea manifolds and the production riser base at Kristin. S-7 will also install the static control umbilicals supplied by FMC.

Offshore activities with vessels including the Seven Arctic are scheduled to begin in 2016 and be completed in 2017. Statoil, which operates the host infrastructure has cooperated closely with Wintershall on the development.

Wintershall (50%) operates for Petoro (30%) and Centrica (20%).

DEVELOPMENT BRIEFS

From Houston (BN): Subsea Services Alliance - Helix Energy Solutions and OneSubsea - announced its first joint technology project to engineer and build a **15K INTERVENTION RISER** system. It will be built at OneSubsea in Leeds, UK, and be available on a rental basis in mid-2017.

Helix also announced it has taken delivery of the Q5000 semi intervention vessel from Sembcorp Marine's Jurong shipyard. Helix said it used a \$250mn credit facility to make the final payment.

BP has handed Technip a contract for the design, engineering, fabrication, installation and pre-commissioning of the new production pipeline systems on the south side of the **THUNDER HORSE** (SEN 32/1) production drilling quarters unit in the GoM.

The current field development is located in 1,900m in Mississippi Canyon Blocks 778 and 822.

The project scope covers project management and engineering, coating, fabrication, installation and permanent anchoring of two rigid production flowlines of 3.25km each with four pipeline end terminations, pre-commissioning and testing.

Offshore installation is set for the second half of 2016 by Technip's flagship vessel the *Deep Blue*, one of the world's largest ultra-deepwater pipelay and subsea construction vessels.

DELTA SUBSEA has booked the newbuild *Olympic Delta* multipurpose subsea support & construction vessel. The 94m long vessel has a maximum speed of 13 knots and is equipped with an 80t AHC crane with 2,000m of wire...Gallatin Marine has asked Tidewater Subsea

to provide work class rosv services on board the *AMC Ambassador* DP2 Jones Act vessel. The vessel is equipped with a 60t AHC knuckle boom crane and is currently providing IRM services primarily in the Gulf of Mexico.

Nexans has delivered one umbilical to the **SNØHVIT** (31/22) field in the Barents Sea off Norway as part of a €5mn contract with Statoil.

The *Snøhvit* activity will establish an additional well at a new CO₂ injection template as well as prepare for gas production from existing templates.

The new umbilical, to be routed between an existing distribution unit to a new subsea template, is the third delivery in a portfolio of standardised umbilical deliveries awarded by Statoil in December 2012 for the Norwegian Continental Shelf.

Nexans' specialised facility in Halden, Norway, has manufactured the new umbilical to Statoil's new design. This has been developed to provide a consistent and cost-efficient solution for simplified or fast track projects, such as tie-ins to existing infrastructure, or other kinds of subsea oil and gas projects.

Installed at a water depth of approximately 300m, the *Snøhvit* umbilical features standard elements with minor adjustments.

From the North Sea (NT): The Norwegian government is putting up NOK30mn for research projects to develop petroleum technology for use in the Arctic. The funds, half from the oil and energy ministry and half from the foreign affairs ministry, is being offered under this year's Demo2000 programme, with applications due in October and awards in December. Altogether the oil and energy ministry is providing NOK 55.5mn for Demo2000 projects this year.



The *Ceona Amazon*

SURF contractor Ceona has been awarded a new deepwater contract for work on Benu Oil & Gas's deepwater **MIRAGE** field in the GoM. This contract comes after a first contract was awarded and completed last year for operations on its Clipper deepwater field.

The agreement will see Ceona deploy its newest vessel, Amazon, to install a 3.8km flexible flowline and a 4.2km umbilical from the Mirage well, which is located in Mississippi Canyon 941.

Each will be tied-back to Benu's Titan production facility at a depth of 1,200m. Offshore work is scheduled to begin in the second half of 2015.

Saipem says it has received notice that **SOUTH STREAM** Transport BV is lifting a work suspension and that Saipem should begin installation activity on the offshore pipeline in the Black Sea.

Pipe integrity and engineering specialist **FLEXLIFE** has won over \$6mn of contracts in the US Gulf of Mexico, the North Sea and Malaysia. Scope includes integrity management engineering, flexible riser annulus testing and ultrasonic scanning, subsea project management and engineering support... Separately, the company picked up another contract with Apache North Sea for work on the **AVIAT** (31/23) gas development in the Central North Sea, the Ness/Nevis tie-in and general subsea operations support for three years.

UK-based **RED MARINE** has developed a modular umbilical clamp system, made up of six purely mechanical elements, in conjunction with FMC Technologies. The clamp solution will be commissioned on board the deep water well intervention vessel, Island Performer, in the Gulf of Mexico and used as a key system element in Well Intervention Operations.

Wood Group Kenny has won a five year contract with **OIL SPILL RESPONSE** to provide maintenance support for a key part of a containment toolkit that would be used to

control hydrocarbon release in the event of a subsea well control incident. WGK will work with OSRCL to ensure that the flexible flowlines included in the toolkit are continuously in a condition suitable for immediate load out if mobilised by subscribing oil and gas operators... Sister company Wood Group Mustang has completed engineering services for the two Marine Well Containment Company (MWCC) vessels that can be deployed in the event of a deepwater well control incident in the US Gulf of Mexico.

Proserv has wrapped up the first phase of a \$40mn contract to provide **SUBSEA CONTROL SYSTEMS** for deepwater projects in Brazil.

The firm has delivered the initial three of nine control systems that will support drill pipe riser (DPR) intervention services at depths of 2,500m. The remaining six systems are expected to be delivered by the turn of the year.

Proserv's DPR control system is the first of its kind for the offshore industry. The product incorporates deepwater electro-hydraulic installation and workover controls for supporting the manipulation of all subsea operations, the tubing hanger running tools and surface test trees.

Prysmian Group's **CABLE ENTERPRISE** vessel is ready for operations after being upgraded from a moored cable laying barge into a DP2 cable laying barge able to manoeuvre with her own propulsion. The vessel's first job in DP mode will be the supply and installation of submarine cables for a section of ExxonMobil's existing offshore operations in the US.

Offshore Installation Services (OIS) will **DECOMMISSION** multiple wells in the North Sea for Centrica Energy. The initial campaign includes six subsea wells in the central North Sea, which will be abandoned using a diverless, vessel-based approach.

Planning and engineering are underway, and operations will take place this summer. The campaign will be conducted from the aht Island Valiant.

Because of the high degree of flexibility permitted with the rigless operations, OIS said it continues to engage with other North Sea operators interested in joining the campaign.

During phase one, the suspended well abandonment tool (SWAT) system from Acteon sister company, Claxton Engineering Services, will be deployed through the vessel's moonpool to set cement plugs in the bore and across all the casing annuli.

The second phase will use an abrasive severance system for the cutting of the wells and sequential removal from the seabed. This will conclude the offshore operations.



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FLOATERS

INSTALLATION WORK MOVES APACE AT *ICHTHYS*

From Australia (RW): Fabricators working on the production units for Inpex's *Ichthys* (SEN, 32/1) field in the Browse Basin have completed the first topside module lifts.

The lift for the fpsi took place at the Daewoo shipyard in Okpo, while the semi central production facility (CPF) lifts were at the Samsung shipyard in Geoje, both in South Korea.

This signals the beginning of the topsides integration phase for the CPF and fpsi. The hulls and topsides were fabricated separately and this new phase brings the parts together as single, connected structures for the first time.

The first CPF module weighed 3,600t and measured 50m by 43m by 26m. The first fpsi module lift weighed 2,010t. Inpex says the combined weight of all topside modules for both facilities is about 120,000t.

When completed the CPF and fpsi will be towed 5,600km from South Korea to the field off Western Australia where they will be permanently moored to the seabed for the expected 40-year project life.

When onstream, gas and some condensate will be sent via the 889km gas export line to the onshore LNG plant in Darwin. Stabilised condensate from the fpsi will be offloaded periodically to shuttle tankers for export directly to market.

Mooring installation has also started with the first 49 foundation piles deployed and driven into the seabed in water depths of 250m. Each pile is about 66m long and weighs in excess of 450t. The mooring work is being carried out in preparation for the arrival of the two production units.

The mooring installation is being led by Heerema Marine Contractors under subcontract to the lead contractor McDermott and using the deepwater construction vessel *Aegir*. The work is being carried out in non-continuous phases with piles driven first and mooring chains to be laid out later.

As part of the offshore installation work, Inpex is overseeing the installation of more than 30,000t of subsea infrastructure and equipment. To date, 47km of flowlines have been laid down along with more than 30 flowline sleeper structures and a 6,500t riser support structure.

Also, Samsung has awarded a A\$16.36mn contract to Nexans for 2,200km of halogen-free instrumentation and electrical cables for the CPF. The cables are being manufactured at Nexans' plant in Jincheon, South Korea and delivery of the order has already begun. It will be completed by the end of this year.

FLOATER BRIEFS

CONISTON FINALLY BEGINS TO FLOW



The *Ningaloo Vision* fpsi

From Australia (RW): The Apache Energy-Inpex *Coniston* (SEN, 32/2) oil field which straddles two licences offshore Western Australia has finally been brought onstream, two years later than the original schedule.

The project includes development of the *Coniston* and nearby *Novara* oil fields via a subsea tieback to infrastructure already in place for the *Van Gogh* field, including the fpsi *Ningaloo Vision* which was recently modified for the subsea hook-up in Singapore.

The vessel can process 150,000b/d of liquids including 63,000b/d of oil. It has storage capacity for 540,000bbls.

The new development includes six *Coniston* production wells and one production well at *Novara* connected to a new subsea manifold at *Coniston* and a pipeline end manifold at *Novara*. The fpsi supplies dry gas for gas-lift in the new wells via new 4in and 6in gas injection lines.

Dual 12in flowlines have been laid from the two fields to *Van Gogh*. Oil then enters the fpsi through flexible flowlines and riser bases.

Development of *Coniston* began in 2011 with a scheduled completion date in 2013. This was pushed out twice – first to 2014 and then 2015.

Apache says *Coniston* will flow at 18,000b/d. It was found in 2000 and has estimated reserves of 15.7mmbbls. *Novara* was discovered in 1989.

Apache had 52.501% until it sold its Australian business unit in April to a consortium of private equity firms led by Macquarie Bank and Brookfield Holdings for A\$2.1bn. Inpex holds the balance.

ExxonMobil has turned the taps on ahead of schedule at the **KIZOMBA SATELLITES PHASE 2** (SEN 32/1) project offshore Angola.

The Block 15 subsea development takes in the Kakocha, Bavuca and Mondo South fields. Mondo South is the first field to begin production, and the other two satellite fields are expected to start up in the coming months.

The project will develop approximately 190mn bbl of oil with peak production currently estimated at 70,000 b/d and is expected to increase total daily Block 15 production to 350,000 bbl.

Exxon says the project optimizes the capabilities of existing Block 15 facilities to increase current production levels without requiring additional fpsos.

The Mondo South field is being developed with tiebacks to the Mondo fpso, while the Kakocha and Bavuca fields are being developed with tiebacks to the Kizomba B fpso.

Nearly \$740 million has been invested in Angola for the project, including contracts for fabrication, logistics support and training and development of Angolan personnel.

“Achieving successful startup has a lot to do with the strong partnership between ExxonMobil and other Block 15 co-venturers, the government of Angola, most notably the Ministry of Petroleum, and Sonangol,” Exxon president Neil Duffin said.

Exxon was awarded Block 15 in 1994 and, to date, has discovered a total of approximately 5bnboe. Oil production from Block 15 to date has exceeded 1.8bn bbl. Kizomba Satellites Phase 1 started production in 2012.

Partners in Block 15 are BP (26.67%), ExxonMobil (operator, 40%); ENI (20%); Statoil (13.33%). Sonangol is the concessionaire.

From the North Sea (NT): After a short stay off Hammerfest, Eni’s **GOLIAT** (32/3) fpso was last week towed 80km north to the field, where early this week it was being attached to its 14 mooring lines.

Installation is in the hands of DOF Subsea, which also performed the tow. Hook-up and commissioning will be supported by the semi *Floatel Superior* which is due to arrive by 1 June. Start-up is expected in mid year, but depends on a number of factors such as the weather, Eni told SEN.

From Houston (BN): Galp Energia reported the fpso *Cidade Mangaratiba*, operating on the **LULA-IRACEMA** fields off Brazil, reached production of 100,000b/d following the tieback of the third production well.

EXPLORATION

ANADARKO PLANS TO APPRAISE SHENANDOAH

From Houston (BN): Anadarko has won approval of plans to drill three new wells in Walker Ridge 51 as part of the appraisal plan for the *Shenandoah* (SEN, 32/1) discovery in the Lower Tertiary area of the Gulf of Mexico.

The supplemental exploration plan calls for the drillship *Ocean Blackhawk* to spud the first well this month. The second is targeted for 2017 and the third for 2019. The 190-day wells will be in 1,780m about 370km southwest of New Orleans.

The 2009 *Shenandoah* discovery in WR52 found more than 90m net pay with better-than-expected reservoir properties in the Lower Tertiary. The first appraisal in 2013 found more than 300m net pay on its way to 9,572m total depth. A second appraiser last year found no commercial hydrocarbons, but Anadarko said it provided valuable data for developing the find.

Regulators also have green-lighted Anadarko’s plan to drill four wells around the *Phobos* (31/10) discovery in Sigsbee Escarpment 39 in the far south of the GoM. The 165-day wells are to be drilled starting in August with the rest in 2018, 2019 and 2021, if efforts are successful. Water depth is 2,675m at the location about 485km south of New Orleans.

Anadarko in 2013 announced the *Phobos* discovery well found 76m net Lower Tertiary pay after reaching a total depth of 8,740m.

Shell is continuing its Civil War-themed activity with a plan to drill in Mississippi Canyon 566, southwest of its *Appomattox* (31/12) and *Vicksburg* (31/9) discoveries.

The approved supplemental exploration plan spins off an initial plan filed way back in 1989. Those wells were never drilled, but Shell now proposes to drill seven 149-day wells, the first due to spud in June. If successful, six more wells will follow at the rate of one a year out to October 2021. Water depths in the block about 225km southeast of New Orleans range from 2,100-2,150m.

Interestingly, MC566 has two operators. BP operates a 50-50 partnership with Shell in production shallower than 6,767m. This production is part of the gas-heavy *Fourier* field based in neighboring MC522. *Fourier* production flows to the *Na Kika* semi hub platform in MC474. Shell operates below 6,767m and its new plan is separate from *Fourier* and aims for prospects deeper than current production.

Meanwhile, Chevron is moving quickly to appraise its *Anchor* (32/1) discovery in Green Canyon 807, announced in January. The company has won approval to drill three 100-day sidetracks from the discovery well. The first sidetrack is set to spud 1 July and the last is set to hit target depth in April of next year. Water depth is 1,585m about 330km south-southwest of New Orleans.

The discovery well, spudded last August, found oil pay in multiple Lower Tertiary sands and reached a total depth of 10,287m.

BHP Billiton has started drilling another producer target on its *Shenzi* development, which the company touted in an OTC presentation as one of the GoM’s most successful.

The 108-day well in GC610 targets a bottom-hole location in GC654. The well is in 1,300m about 290km south of New Orleans. *Shenzi*, discovered in 2002, has been producing since 2008 and now has 13 producing wells and four injectors. Average daily production is about 92,000 b/d, BHP told an OTC briefing.

Freeport-McMoRan has won approval of plans to drill, complete, test, flare and install subsea wellheads for five additional well locations at its *King* project, in 1,635m in MC 84, 85 and 129, 233km southeast of New Orleans. The work is to begin in September 2016 and be completed in 2017.

EXPLORATION NOTES

From Australia (RW): Chevron has made a new gas discovery in its **ISOSCELES-1** wildcat in the *Greater Gorgon* (31/23) area off Western Australia.

The well has encountered a 134m net gas pay in the Triassic-age Mungaroo Sand reservoir about 95km northwest of Barrow Island where the *Gorgon-Jansz* LNG plant is nearing completion. Water depth at the discovery well is 968m.

The find is a continuation of the company's exploration success in the region and adds to the resources available to the LNG project.

The existing \$54bn project aims to produce 15.6mt/a of LNG with first cargoes scheduled for the latter part of this year.

Kosmos Energy is planning an appraisal programme on its **TORTUE WEST** (31/22) prospect, offshore Mauritania, after its *Tortue-1* exploration well in Block C-8 made a 'significant, play-opening' gas discovery.

Based on the preliminary analysis of drilling results and intermediate logging to a depth of 4,630m, *Tortue-1* has intersected 107m of net hydrocarbon pay.

Located approximately 285km southwest of Nouakchott in 2,700m, and drilled with the drillship *Atwood Achiever*, *Tortue-1* well is now drilling to planned total depth of approximately 5,250m.

Kosmos said a single gas pool was encountered in the primary Lower Cenomanian objective, which is comprised of three excellent quality multi-Darcy reservoirs totaling 88m in thickness over a gross hydrocarbon bearing interval of 160m.

Andrew G. Inglis, chairman/ceo, said, 'Volumetrically, the *Tortue-1* well has far exceeded our pre-drill expectations and has discovered a large scale gas resource. Our seismic imaging indicates the areal extent of *Tortue West* could cover approximately 90km² that will be better defined with appraisal drilling.'

As well as the appraisal programme being planned to delineate the *Tortue West* discovery, the *Marsouin-1* exploration well, located in the central part of Block C-8, is expected to spud in Q3 2015.

King, which F-M acquired by buying Plains which had acquired it from BP, has been producing through the *Marlin* tlp since 2002.

Stone Energy's Q1 operational report noted that the *Vernaccia* exploration well in Mississippi Canyon 35 (Eni operates, Stone: 32%) is set for spudding in the third quarter of this year. The well targets the Miocene. The ConocoPhillips-led (COP 63.33%, Stone the rest) *Harrier* prospect in Mississippi Canyon 118 was drilled to 5,913m without encountering commercial hydrocarbons and will be plugged and abandoned.

An exploration programme is also being formulated to test the other prospects in the *Greater Tortue Complex*, which extends into the St. Louis Offshore Profond Block in Senegal, including the *Tortue East* and *Tortue North* prospects.

A 3D seismic survey acquired over its Senegal blocks in 2014 is currently being processed and interpreted.

AGR has signed an MoU with SP Offshore to drill an ultra-deepwater well off the **COMOROS ISLANDS** between Mozambique and the Comoros.

SP Offshore works exclusively for Western Energy and Safari Petroleum which were awarded a production sharing contract in blocks 38, 39, and 40 in the Comoros in March 2014. It now plans a programme of exploration studies including seismic interpretation, basin modelling, and resource assessments, followed by the drilling of the wildcat.

Rockhopper Exploration says the *Erik Raude* rig has now completed repairs to the BOP control system and the subsequent re-testing of the BOP stack following its return to the **ISOBEL DEEP** (32/2) well off the Falklands, where drilling re-started on 11 May.

Since suspending operations on the *Isobel Deep* (14/20-1) well on 24 April, the rig has spudded and suspended the *Jayne East* (14/15c-6) well at 541m on 29 April and spudded and suspended the *Chatham* (14/10-10) well at 1,388m on 4 May.

From Australia (RW): Karoon Gas' test of the **ECHIDNA-1** wildcat in the Santos Basin, offshore Brazil, resulted in a stabilised oil flowrate of 4,650b/d from Paleocene reservoirs with a flowing head pressure of 504psi on a 1in choke.

The flow, over a two-hour period, was constrained by the test facilities. An earlier drillstem test over the intervals 1,767m-1,806m and 1,813m-1,843m over a 24-hour period averaged a stabilised flow of 3,200b/d through a 44/64in choke with a wellhead flowing pressure of 733psi and a gas/oil ration of 701ft³/bbl.

Physical oil samples measured 38.6°API with a gas/oil ratio of 701ft³/bbl. There was no measurable CO₂ or SO₂ present and no sand production.

Echidna-1 is in Block S-M-1102 and intersected a 213m gross thickness oil column with 104m of net pay across Paleocene and Maastrichtian reservoirs. Karoon says the Maastrichtian section will be evaluated with cores and production tested in 'more optimally located appraisal wells on the field'. The company added that the Paleocene reservoir quality at *Echidna* is better than observed anywhere else in Karoon's Brazilian acreage.

Karoon which operates (65%) for Pacific Rubiales Energy Corp has decided not to take up a second well option. Instead the partners will continue geoscience and engineering work to characterise both *Echidna* and the earlier *Kangaroo* (31/23) discoveries. Further appraisal drilling is planned in the 'near term'. Pre-feed studies will be conducted in parallel with the appraisal drilling program.

Maersk Oil's **Xana-1X** exploration well, in licence 9/95 in the Danish sector of the North Sea, has hit pay. The hpht well was drilled in 68m and reached a total drilling depth of 5,071m in the Jurassic formation.

The well was spudded on 8 December 2014 by the jack-up rig *Noble Sam Turner* and is currently being plugged and abandoned. Partners are assessing the next move.

From Australia (RW): The Cairn Energy-led group has signed up the drillship *Ocean Rig Athena* for up to six wells surrounding its **SNE-1** oil discovery, offshore Senegal, beginning late this year into 2016.

The group, including ConocoPhillips and FAR, has formally submitted a three-year evaluation plan to the government for three firm and three optional exploration

and appraisal wells. *Ocean Rig Athena* is currently working for COP off Angola.

The firm drilling programme of three wells will comprise two appraisals of SNE-1 including cores through and tests of the reservoir. There will also be one shelf exploration well within a 25km radius of the discovery.

In addition the group plans a 2,000km² 3D seismic survey over the Sangomar and Rufisque blocks to aid understanding the prospectivity of the contract area.

SNE has a gross estimate 2C contingent resource of 330mmbbls with excellent reservoir characteristics and Cairn hopes to develop the field by 2020, subject to a successful appraisal campaign.

The three contingent wells are subject to ongoing evaluation of the *FAN-1* discovery and the results of the three firm wells.

From Houston (BN): The Guyana Ministry of Natural Resources has said ExxonMobil found hydrocarbons of still-to-be-evaluated quality and quantity at its offshore **LIZA** prospect.

Also, Petrobras has released an estimate that its **ORCA-1** gas discovery, offshore Colombia, contains 28-56bcm.

The Brazilian operator also said it completed a third well in the Sergipe Basin's **MOITA BONITA** Area. The well, which energy regulator ANP dubs 3-BRSA-1296-SES, confirms light oil and good reservoir qualities. The well in 2,988m was drilled to 6,060m. It is 94km off the Aracaju coast, 10km from the Sergipe discovery well. Petrobras received the 2015 OTC Distinguished Achievement Award for accomplishments in producing the pre-salt.

BUSINESS

STRIKE ACTION, PESSIMISM THREATEN N SEA RECOVERY

From the North Sea (IF): The threat of possible strike action continues to hang over the UK North Sea.

Officials from the GMB and Unite unions will be involved in further talks on Wednesday (20 May) on the dispute over unilateral changes to working conditions for workers covered by the Offshore Contractors Agreement.

After latest discussions with the Offshore Contractors Association last week, the unions agreed to put on hold the ballot for strike action. Members of both unions have already voted in a consultative ballot to go ahead with the official ballot.

Unite said the improving oil price should bring an immediate end to the industry's 'opportunistic campaign' of job cuts and impositions to working conditions such as a new three week on, three week off shift pattern.

Unite Scottish secretary Pat Rafferty said 'the recovering oil price' should put an end to the imposition of 'regressive working practices' across the North Sea.

'Our members have been very clear that the industry's actions will not only compromise the sustainability of jobs and skills for the next generation of oil recovery,' Rafferty

said, 'it could also have catastrophic consequences for offshore safety too.'

The union official said big oil companies must stop exerting commercial pressure on contractors to allow time to negotiate a sustainable future between the workforce and its employers.

Optimism continues to fall in the industry here, according to the latest quarterly Oil & Gas UK Business Sentiment Index. Confidence in the sector has dropped from -23 points to -31 on a -50/+50 scale.

For the past eight quarters, the sector's optimism has followed a downward trend and the overall index has dipped further into negative territory, for the third quarter in succession.

Meanwhile, most northeast Scotland businesses are worried about the impact of lower oil prices, it has emerged in another study. More than 90% of firms said the decline in the oil price has had or is expected to have a detrimental impact.

The survey also found the lower oil price has driven 59% of energy-sector companies to reduce prices and

has also resulted in 40% losing contracts and 29% making redundancies.

Among the latest North Sea firms to be planning to cut jobs are Stork, Amec Foster Wheeler and Wood Group, while Rowan Drilling UK is mulling the possibility of redundancies.

Subsea 7 this week announced a programme of cost-reduction measures including slimming down in its fleet and workforce. The overall reduction in workers numbers could be around 2,500 by early 2016, while the fleet will be reduced by up to 11 vessels. More than 400 posts are expected to go in the UK.

CLIENT/SUPPLIER RELATIONSHIPS FEEL THE STRAIN

The latest international survey of the offshore oil and gas sector reminds the industry of some of its worst ills that have only been exacerbated by the current low-price environment.

According to work done by Barney Parson Associates based in the UK, the low oil price has put client/supplier relationships under strain at a time when greater cooperation – with the requisite higher level of trust – is required to reduce costs.

Some other familiar points include the need for more standardisation; a continued drive for new technology, but with faster implementation; and cutting back on R&D work and maintenance of ageing facilities will be counter-productive in the long term. The key areas for R&D focus are subsea boosting and pumping, flow assurance and hp/ht technology.

A closer look at the study gleaned some interesting points. More than half of suppliers believed that they would benefit for ‘independent evaluation’ of their customers’ opinion on how they perform. While better cooperation, more technology and standardisation are

seen as the top three issues to reduce costs, the fourth, somewhat surprisingly, is more competition.

And where should the cost reduction come from? Reduced rig and vessel rates were at the top of the list, but the downturn has already brought prices down. Lower cost for subsea hardware is another, but how does this match with the need for new technology, notably in the hp/ht area. And the third is ‘life of field’ expenditure. This can only come from operators when they can convince development teams that operations are part of the same company and spending money upfront, even if it impacts on development capex, is a good thing.

As for new technology, subsea processing plus boosting are at the top of the agenda along with EOR and riserless light well intervention. Very encouraging for subsea technology developers, but this sounds like a wish list from big operators. There is considerable technology already in the market which remains under-utilised, because many small and medium sized operators are either afraid or simply want to do things as before. So what else is new?

COST INFLATION IS UK SECTOR'S PUBLIC ENEMY NO 1



The UK sector has been hit by cost inflation

From Aderdeen (IF): The rampant cost inflation which UK North Sea producers have been battling against in recent years was starkly highlighted at an industry event in Aberdeen.

Dan Cole of McKinsey & Co's London-based oil and gas practice said offshore inflation was way out of line compared to the general economy. The annual rise in

inflation in Britain from 2000–2014 was 2.5%, but the cost of operating an offshore installation went up by 12% per annum in that period. Meanwhile, the development cost per barrel rose by 21% annually between 2004 and 2013.

Cole told last week's Oil & Gas UK (OGUK) breakfast that with an oil price of \$55/bbl, nearly half of North Sea fields were uneconomic.

In case anyone was struggling to understand what the steep percentage rises meant, he said if the fast-food industry faced the same inflation, a burger which cost £2 in 2000 would be a staggering £13 today. The 2015 burger is still priced at less than £3.

Cole said that cost inflation in the oil and gas industry was not due to increased activity, or the supply chain becoming more profitable. Factors behind cost increases included the likes of higher wages and greater inefficiency.

He said a way forward was to consult with the aerospace and automotive industries, where cost inflation since the start of the century had averaged just 1% a year. Aerospace manufacturing had kept costs down by parts

standardisation and by more collaboration with the supply chain, while the automotive sector was benefiting from standardisation and increased collaboration between rivals.

Oonagh Werngren, OGUK's operations director, who chaired the breakfast briefing, said, 'Tax reforms announced in the ... 2015 budget and the establishment of the new regulator, the Oil & Gas Authority, have laid the foundations for the regeneration of the North Sea and the industry is now building on this by delivering the cost and efficiency improvements required to secure its long-term future.'

Ms Werngren said there is now a concerted effort to tackle the fundamentals that have driven cost escalation here matched by tough decisions on resources and projects taken by individual companies.

'The goal is to achieve a more internationally competitive ... province and attract the fresh investment needed to unlock the North Sea's remaining potential,' she said. 'Achieving this will require a 40% reduction in the industry's cost base.'

OGUK said the Mercer consultancy has been commissioned to carry out a survey of daily rates paid to independent contractors, allowing companies to benchmark their rates against the market. The industry body has also established a database of spare parts held in inventories across the sector which will allow replacement equipment to be sourced quickly and efficiently with the aim of reducing production downtime.

Meanwhile, Step Change in Safety is carrying out a mapping exercise of control of work and training processes to identify priority areas where standardisation will achieve improvements in efficiency.

'Our vision for 2020 is an industry actively exploring and maximising recovery of the UK's oil and gas, a supply chain providing a strong engine for growth with lifting costs less than \$20/bbl,' Ms Werngren said. 'The sector now has to deliver the bold action and behavioural change needed to make the vision a reality.'

BUSINESS BRIEFS

From Houston (BN): Petrobras announced it is filing lawsuits related to the **OPERATION CAR WASH** scandal seeking to recover losses due to improper payments to companies which then gave 'kickbacks' to Petrobras employees.

The suits - filed jointly with federal prosecutors - seek recovery of funds misapplied, fines and 'material and moral damages'. The first two lawsuits target the dealings of Enegevix and Mendes Junior with Petrobras' downstream division.

Total of damages sought is R\$452mn. Petrobras said it will file three more lawsuits against Camargo Correa, OAS and Galvao Engenharia seeking R\$826mn. Petrobras has already received R\$157mn from federal officials who described the money as repatriated from Swiss accounts.

Petrobras has also announced a new director and composition of its audit committee as part of efforts to restore investor confidence.

GE OIL & GAS and **ENPRO SUBSEA** have teamed up to offer fluid well intervention services to the global market

GEOG says the tie-up is a step in growing its 'life of field' service business by investing in technology R&D. Enpro's Integrated Subsea Sampling and Injection solution is a small, lightweight system that enables multiple well campaigns from a single vessel. The equipment can be operated subsea by an rov which can be deployed at multiple injection locations.

From the North Sea (NT): **CECON ASA**, the holding company of the Norwegian subsea construction group, has been declared bankrupt, although its subsidiaries continue to operate.

The company's efforts to agree a debt restructuring with its creditors were torpedoed when €38mn posted as a performance bond in an escrow account in Holland were released by the bank to GDF Suez (now renamed Engie), Cecon tells SEN. Cecon is in dispute with the French company over a pipelay contract.

Cecon Pride, the first of three subsea construction vessels built by the Davie yard in Canada, was delivered last year and a majority interest sold to the Fortress Investment Group. The vessel is under charter to Micoperi in the Mediterranean, operating as *Micoperi Pride*.

As new work is sought, although so far without success, by the Cecon Contracting subsidiary, delivery of the second and third vessels, *Cecon Excellence* and *Cecon Sovereign*, has been put back to end 2015-early 2016 and end 2016-early 2017, respectively.

From the North Sea (NT): Hungarian oil company **MOL**, already active in the UK, is to enter Norway by acquiring Ithaca Petroleum's 14 licences, three of them operated.

The deal, expected to be completed in Q3, will cost it \$60mn plus bonuses of up to \$30mn depending on future exploration success. The committed work programme includes three exploration wells in 2015-16.

According to MOL, the portfolio contains prospective resources of more than 600mboe, all in lower risk areas of the North Sea. The operated licences are in the *Vårg* area and east of *Eldfisk* and *Vålhall*.

From Australia (RW): The **ASCO** group has won a contract to manage the operations, maintenance logistics and supply base for Shell's *Prelude* floating LNG project in the Browse Basin off Western Australia. The contract includes Shell's

supply base in Darwin as well as the logistics requirements throughout Australia and supply vessel support.

This is the second major win for Asco which secured an award from BP to manage that company's supply base at Flinders Port in South Australia for the Great Australian Bight exploration programme beginning in late 2016.

Also, logistics company **QUBE HOLDINGS** and the miner **MOUNT GIBSON** Iron have signed a framework agreement that could turn the iron ore mine at Koolan Island, located in the Buccaneer Archipelago 1km off the Kimberley coast of Western Australia, into a supply-operations base for Browse Basin explorers and producers.

The mine was flooded and closed last November when a seawall failed. The company wrote down the mine by A\$946mn this year and no decision has yet been made about options to rebuild the seawalls and resuscitate iron ore production.

In the meantime Qube has come up with a plan for staged development of helicopter refuelling and maintenance facilities, air search and rescue facilities, all-weather runway for passenger jet aircraft, a deep-water marine terminal and accommodation facilities. Koolan Island is considered a prime location for a base because it is close to Browse activity, has significant existing infrastructure and would use an already disturbed part of the island thus minimising environmental impacts.

Preliminary discussions have been held with the traditional Aboriginal owners of the land, local and State government and prospective end users.

NEPTUNE MARINE SERVICES has been awarded an offshore diving and subsea inspection services contract by Oil Search for work in the Gulf of Papua. The five-year contract began in April and involves call-out diving support and other services focusing on the Kumul marine terminal at the marine delivery end of the pipeline bringing oil down from the Kutubu oil fields in the PNG Highlands.

A group of ex-FMC employees have teamed up with subsea installation player DeepOcean to found **OPTIME SUBSEA SERVICES**.

It has set up offices in Houston, USA, and the city of Notodden, which is part of the 'Subsea Valley' industry cluster in Norway. The company develops its own technology and provides services within subsea intervention, installation and work over operations.

"The oil and gas operators have for years requested a cost reduction within the subsea industry. So far their expectations have not been met. A change needs to happen now! Our technologies will limit operators' capex and significantly lower their opex. For example, one of our solutions can save \$1-2mn per vertical subsea tree installation," says Jan-Fredrik Carlsen, CEO of Optime Subsea Services.



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