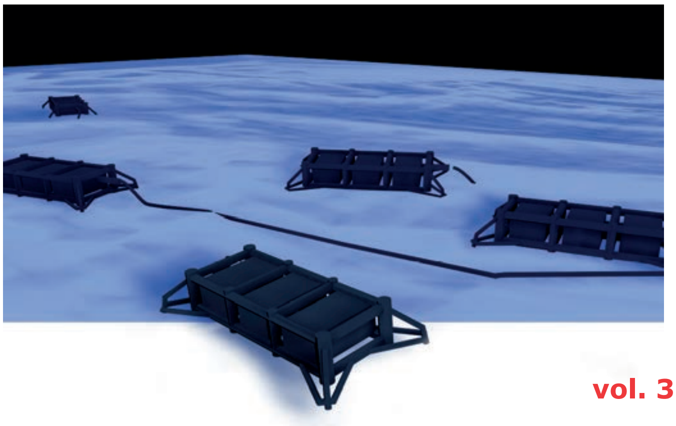

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HARTENERGY

SEN

SUBSEA ENGINEERING NEWS

DANA LOOKS TO KNIT *ARRAN* PLAN

From the North Sea (NT): Dana Petroleum is close to selecting a revised development concept for the *Arran* (30/2) gas/condensate field.

Its previous plan was scuppered in April 2013 year when BG cancelled plans for the *Lomond* bridge-linked platform where subsea facilities at *Arran* in the UK central North Sea were to be tied back.

So it is probably looking to other potential hosts in the area such as BP's *Mungo* platform, 15km to the south; Teekay's *Voyageur Spirit* circular fpso which handles production from E.ON's *Huntington* (31/3) field, some 30km to the west; or BP's *Marnock* platform, 35km to the southwest.

Move the gas

The company is also trying to conclude gas transport arrangements for *Platypus* (27/4) in Southern Basin block 48/1a. The nearest hub is Perenco's *Cleeton*, some 25km to the northwest. Dana also has the *Pharos* (30/17) discovery, 15km to the west in 47/5d, although it does not mention it.

Still in the southern basin, work is progressing to seek government approval by the end of next year to develop *Tolmount* (30/11) and bring it onstream in late 2018. *Tolmount* is an E.ON discovery in 42/28d where Dana is a 50% partner. The closest hub again is *Cleeton*.

But the company drew a blank when it drilled an exploration well on the *Berneray* prospect in the northern North Sea early last year, looking for additional reserves to produce through the coming *Western Isles* fpso (31/5). It reveals in the annual report that it has contracted Knutsen to provide shuttle tanker services for this floater development.

In May, Dana completed its acquisition of 40% in PA Resources' Danish licence 12/06 containing the *Broder Tuck* and *Lille John* discoveries and took over the operatorship. The fields lie 30-35km from Dana's *Hanze* field in the Dutch sector which looks a likely tieback point. Its first task will be to drill an appraisal well on *Lille John* late this year.

WHAT'S INSIDE

Last year the company's production fell by nearly one fifth to just under 47,000b/d, not least due to a whole year's shutdown of the *Banff* fpso where *Kyle* and *Enoch* are also tied back, as well as operational problems on other UK fields. (*From the Editor:* Premier reported this week that the redevelopment of *Kyle* is almost complete with the riser to the *Banff* fpso now installed. It is due back onstream before the end of the month.)

PROJECT UPDATES

PARTNERS SORT OUT *AASEN* STAKES

From the North Sea (NT): The partners in Norway's *Ivar Aasen* (29/20) development have reached a unitisation agreement by mid year as they planned.

This gives operator Det norske oljeselskap, a stake of 34.8%, but the company has not revealed the other interests. With the start of summer holidays, no one is answering calls. When approached, Wintershall referred the matter back to Detnor. According to Detnor, the other partners in the *Aasen* unit are Bayerngas, Lundin, OMV, Statoil and VNG.

Unitisation became necessary when NPD determined that Wintershall's 2013 *Asha* (31/7) discovery in 16/1-16 is part of *Ivar Aasen*. Recently Detnor has acquired a 40% stake in that licence from E.ON and Spike.

Aasen 2P reserves are now estimated at 210mboe, about 35% up on the end 2013 figure. This reflects the inclusion of volumes from *Asha* as well as from licence PL 338, Detnor says, the latter covering Lundin's *Edvard Grieg* (30/8) field, and not previously been associated with *Aasen*. In fact, this will come as news to the NPD, which does not list it as one of the *Aasen* licences.

An updated drainage strategy has been submitted to the authorities, based partly on an ocean bed seismic survey. This shows that no additional production wells will be needed despite the inclusion of the *Asha* reserves.

Capex is unchanged from the PDO at NOK27.4bn, Detnor says, although the PDO figure was NOK24.9bn.

TOTAL CONTINUES TO LEAD WITH *EDRADOUR* GO-AHEAD

While most of the operators in the offshore world continue to sit on their hands when it comes to committing new money to projects, Total stands alone as a company ready to act.

The French major is to push ahead with its second West of Shetlands deepwater gas project in UK waters at *Edradour* (SEN, 29/16) which will be linked through infrastructure to *Laggan-Tormore* (29/7).

It has also expanded its holding in the area by taking a 60% stake and operatorship of the nearby *Glenlivet* (29/16) prospect and plugged into its future development schedule.

As at its recently announced *Kaombo* (31/6) fpso project in Angola, Total cracked the whip on costs. The difference is that in Angola it ran the slide rule over its own approach, while here it 'worked with suppliers', ie squeezed a few people, to reduce the capex to £340mn. So-called 'cost discipline' can work both ways.

Edradour, in 300m in Quad 206/4a, will based on the conversion of the original discovery well to a producer and the installation of a 16km pipeline that will link into a tee on the *Lag-Tor* export line to its terminal on Sullom Voe. Production, due to begin in late 2017, is expected to be 2.9mcm/d.

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Technip has picked up the subsea construction job and committed its new deepwater reel-lay vessel *Deep Energy* for the work. This will involve a 12in production line and a 6in MEG line with a 2in service piggyback plus supply and installation of a steel-tubed umbilical.

Deep Energy is equipped with a 50t plet handling system which is used to move seabed structures from below deck to the lay tower. Its installation brief includes a plem, flet, flexible tails, rigid spools plus free-issue production template and manifold.

Glenlivet which is in deeper water at 435m in Quad 214/30a will eventually be developed with two wells and a 17km pipeline linked back to *Edradour*. A decision is expected on this development in the short term.

One of the most intriguing aspects of the *Edradour* tendering was the decision by Total to ask the umbilical suppliers to bid twice on the basis of two different steel tube suppliers.

Technip has not replied to queries as to whether market leader Sandvik or newcomer Vallourec is supplying the tubes.

There has also been no announcement about the hardware contract, but it seems likely to fall into FMC's hands as it supplied the equipment for *Laggan-Tormore*. Total is hardly going to start messing around with different control systems at this point.

IARA EWT MARKS JUST ANOTHER BRAZILIAN HIGHLIGHT

From Houston (BN): Petrobras began an extended well test at its *Iara* prospect (SEN, 30/17) in BM-S-11 block in 2,200m about 300km south of Rio de Janeiro.

The test is being conducted on well 3-BRSA-1132-RJS in the western section of *Iara*. Initial production of 29,000b/d is similar to other Santos Basin pre-salt wells. *Iara* was discovered in 2008. Petrobras operates (65%) for BG (25%) and Petrogal (10%).

Petrobras has reported that total pre-salt production in the Santos and Campos basins hit 520,000b/d on June 24. Petrobras needed just eight years and 25 wells to reach this goal, the company boasted.

The company compared the rate of growth to development of the post-salt province in the Campos, which was first discovered in 1974 and took 21 years and 411 wells to hit 500,000b/d. The pre-salt in May accounted for 22% of Petrobras' production in Brazil. From 2010 to 2014, pre-salt output grew more than tenfold from 41,000b/d.

Startup of new wells feeding floaters *P-58* (*Parque das Baleias*), *P-63* (*Papa-Terra*), *P-55* and *P-62* (*Roncador*) contributed to post-salt and pre-salt production. Twenty-two wells, 14 producing and eight water injection, will be linked to *P-62* in the next few months.

At the *Lula* and *Sapinhoa* fields, flowrates above 30,000b/d/well have been achieved. Innovative buoyancy-supported risers are being installed and wells producing to fpso *Cidade de Sao Paulo* and *Cidade de Paraty.*

The McDermott- FloaTEC built tlwp *P-61* – the first dry-tree floater in Brazil - is onstream at *Papa-Terra*, teamed with the tender assist drilling semi *SS-88*. Chevron touted the first offloading from *Papa-Terra.* This occurred 9 May and involved *Brasil Voyager*, a shuttle tanker specially built for the operation.

The vessel lifted 740,000bbls and headed for Chevron's Pascagoula MS refinery, where oil will be processed. *Brasil Voyager* is due to offload 950,000bbls from *Papa-Terra* every 40 days. On 12 May, production began from a third well at *Papa-Terra* with two more expected online this year.

In addition, fpso *Cidade de Mangaratiba* at *Lula/Iracema* and *Cidade de Ilhabela* at *Sapinhoa*, both in the Santos Basin pre-salt, will be installed by the end of the year.

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DRILLING UP IN THE NORTH SEA, BUT PROBLEMS LOOM

From the North Sea (NT): The Norwegian Petroleum Directorate reports a vigorous exploration campaign in the first half of the year with 23 wildcats and 10 appraisal wells drilled. Thirteen discoveries were made, although most were modest.

The largest find was VNG's *Pil* (SEN, 31/5) well 6406/12-3S in the Norwegian Sea (38-132mmbbl and 2-6bcm.) In the Barents Sea, Statoil's *Drivis* (31/4) wildcat 7220/7-3S found 44-63mmboe.

Of the other wells, two each in the Norwegian and Barents Seas and seven in the North Sea, many may struggle to be commercial. The fact that all the North Sea finds were close to producing fields – *Heimdal*, *Oseberg*, *Gullfaks* and *Fram* – could be helpful.

Eight wells were drilling as mid year passed, including one – OMV's *Hanssen* in the Barents – which has since made a discovery. Robust exploration activity is expected to continue for the rest of the year, says NPD.

However, the picture is very different when it comes to turning discoveries into developments. No plans for development and operation were submitted in the first half of the year and only one project was approved – Maersk's *Flyndre* (31/5), which is a UK project with a minor Norwegian component.

From Aberdeen (IF): The level of exploration drilling in UK waters got off to a promising start this year.

Figures from the Department of Energy show six wells were begun in the first quarter of the year, as against only two in the final quarter of 2013.

Restrained euphoria

There were just 15 wells in all last year, but any celebrations about a potential exploration drilling upturn could be premature as the six wells in the first quarter of 2014 were still behind the tally of seven for the first quarter of 2013.

Industry body Oil & Gas UK (OGUK) said at the start of this year the industry is facing its biggest exploration challenge in 50 years.

Exploration over the past three years has been the lowest in the history of the UK Continental Shelf and in 2013 replaced just 80mmbbls.

The OGUK activity survey published in February says operators have indicated that they could drill around 25 exploration wells in 2014. OGUK economic and commercial director Michael Tholen said this figure really needed to at least be in the low-30s.

PROJECT BRIEFS

Some things are quite obvious, but need to be enunciated anyway. Irish Energy Minster Pat Rabbitte said, in a statement to the Dail last week, that **EIRE** needed an increase in drilling activity for the country to realise what he called its 'petroleum potential'.

Not exactly rocket science, but in light of the Wood Mackenzie report on the Irish offshore fiscal regime (SEN, 31/7) it needed to be said for one reason. Rabbitte pointed out that WoodMac's analysis that Eire is a 'high-risk, high-cost' sector is not understood by those who believe that 'potential' resources do not always translate into 'proven' reserves.

What will be the final straw is who takes up acreage next year in the latest licencing round when the fiscal regime will be more favourable to the state. If companies see the new regime as less advantageous, there may be few takers. It is a waiting game.

From Australia (RW): Chevron's **GREATER GORGON** (31/2) subsea gas-to-LNG project has passed another milestone with the landing of the final module for the first LNG train on Barrow Island off Western Australia.

The 6,300t section of the plant measured 55m by 46m by 45m. It is the last of 21 modules needed to assemble Train 1.

Chevron says the first CO_2 compressor and domestic gas modules are already on site. The CO_2 compressor is a vital part of the associated re-injection project and is the largest of its kind in the world. Re-injection of CO_2 into reservoirs under Barrow will make *Gorgon* one of the most greenhouse efficient LNG developments ever built.

When operational, the domestic gas module will condition gas flow and increase its pressure to enable it to be transported through a 90km undersea pipeline from Barrow to connect with the mainland gas grid.

Ithaca Energy continues to get the desired results from the production drilling programme at its **GREATER STELLA AREA** (31/4) development. The third producer, *B-1*, flowed at over 12,000boe/d - over 7,500b/d of oil with the remainder gas - and the company is now convinced that its 30,000boe/d forecast production will be hit.

B-1 is now being suspended and will be ready for production once the floater *FPF-1* is on location and hooked up.

From the North Sea (NT): Norwegian yard Nymo has been awarded a five-year frame agreement by Marathon Norge for fabricating subsea facilities for the further development of the **ALVHEIM** (31/4) field.

The agreement kicks off with a 200t manifold which is due for delivery in Q2 2015. The yard recently delivered a 200t manifold and plem for the *Bøyla* tieback to *Alvheim*. These were installed last month by Technip construction vessel *Skandi Arctic.*

The partners in the Noble Energy-operated upcoming **LEVIATHAN** (31/5) deepwater gas field, offshore Israel, have signed an LOI to provide 7bcm/a for 15 years to British Gas for its LNG facility in Egypt. The LOI is non-binding as it is subject to approval by the governments of both countries.

Rig design specialist RDS has picked up work on two Norwegian sector projects. It is handling pre-FEED on the drilling system for Statoil's **SNORRE C** (30/20) tension leg platform and has also been awarded FEED work for the same operator's **JOHAN SVERDRUP** (30/22) platform as a subcontract from Aker Solutions.

Technip has picked up a four-year **DIVING AND IRM** frame agreement from Statoil, ExxonMobil and Gassco. The deal which begins in December and includes options for an additional seven years replaces an existing eight year deal. It covers activity in Norwegian waters, the Mediterranean and offshore eastern Canada.

This agreement which also includes deployment of Norway's pipeline repair system could give Technip access to ExMob projects in Canadian waters and Statoil's TAP pipeline work off Italy.

Wood Group Kenny is to provide subsea and SURF engineering services to Tullow Oil for its **TEN** (31/1) deepwater fpso development, offshore Ghana...ShawCor is to handle field joint coating services for the first pipeline in the **SOUTH STREAM** (31/4) gas system across the Black Sea.

From Australia (RW): Woodside Petroleum has broken a long drought on the exploration front and made a new gas discovery offshore Western Australia in its **TORO-1** wildcat.

The well is in the Exmouth Sub-basin of the Carnarvon Basin northwest of Exmouth. It reached a total depth of 3,724m and intersected a 150m gross gas column in the Mesozoic Mungaroo Formation target reservoir. Wireline logs have confirmed the gas column through pressure measurement and gas sampling.

The well, which is 22km from the *Ragnar-1A* discovery in the same permit, made in 2012. Woodside operates (70%) for Mitsui (30%).

From the North Sea (NT): OMV has made a second discovery in the Hoop High area of the Norwegian Barents Sea.

However, the reserves volume turned up by **HANSSEN** exploration well 7324/7-2 looks relatively modest – 20-50mmbbl of oil.

The well, which was drilled by the semi *Transocean Barents* in 418m, found a 20m oil

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column with good reservoir properties in which a formation test was carried out.

Hanssen lies 7km northwest of OMV's *Wisting Central*= (30/16) discovery made last year for which the NPD now estimates reserves at 113mmbbl. The new well confirms the potential of 200-500mmbbl for the *Wisting* area, the operator comments, which is on the same licence, in which OMV is partnered by Idemitsu, Petoro, Statoil and Tullow.

However, Statoil's first wildcat in the Hoop High area at *Apollo* (31/5) 7324/2-1, was classified as dry last month although it found good quality reservoir rock.

Located some 45km north of *Wisting Central*, it was drilled by the semi *Transocean Spitsbergen* in 443m. The rig has now spudded *Atlantis* wildcat 7325/1-1, the most northerly well yet to be drilled in Norwegian waters. OMV and Petoro are also partners in the Statoil licences, as is ConocoPhillips.

From Australia (RW): Pre-emption rights associated with the sale of two Browse basin permit interests by Karoon Gas to Origin Energy (31/6) have expired paving the way for the deal to proceed.

Karoon is selling its 40% interest in each of the two **POSEIDON** gas permits to Origin for an $600mn in cash payable on completion.

Karoon will also receive a deferred cash payment of $75mn payable on a final investment decision on the development of the fields and a second deferred cash payment of $75mn at first production.

Origin will also pay Karoon $5mn for every 3bcm independently certified 2P reserves exceeding 92bcm across the permits at the time of FID up to $50mn. The sale is expected to be completed during the third quarter of this year.

In the meantime Karoon has secured a $100mn bridging loan from the National Australia Bank to ensure it has sufficient capital to continue its share of ongoing exploration programme commitments in the period leading up to completion of the sale.

Other interest holders in the two permits are ConocoPhillips operates (40%) the two permits and PetroChina has the other 20%.

From Houston (BN): **STONE ENERGY** has announced a sale of some of its shallow-water Gulf of Mexico properties. Stone disclosed a definitive agreement to sell conventional shelf properties to Talos for $200mn and assumption of future abandonment liabilities estimated at $117mn.

Stone has retained a 50% interest in deep drilling rights on the properties. Stone CEO David Welch said the goal is to focus on GoM deepwater projects and Gulf Coast deep gas.

Also, Apache has completed previously announced sale (31/4) to Freeport-McMoRan of its interests in the *Lucius* and *Heidelberg* spar projects, both operated by Anadarko, along with interests in 11 other leases.

Certain licencees in *Lucius* exercised their preferential rights to purchase their prorata share of Apache's interests on the same terms as those negotiated by F-M. (*NB:* Inpex has now said that has taken up its pre-emption rights to increase its stake in 7.75%.)

From Australia (RW): 3D Oil has now secured binding deals made with its partners in the **WEST SEAHORSE** (30/21) project in May. The deals involve restructuring, funding and ownership of the offshore Gippsland Basin permits and enable 3D to meet its share of development costs.

The deals include selling 5% interest in one permit and its 49.9% interest in the *Britannia* rig to Carnarvon Hibiscus for $7.5mn. 3D will also transfer a 6% interest in the other permit to Carnarvon to offset the $1.94mn in cash that it owes the operator. It will additionally grant Carnarvon the option to purchase its remaining 43.8% in the permit for $14.05mn.

On top of that, HIREX has an option to earn a 20% interest from 3D in one permit in exchange for the provision of data analysis for the permit using its virtual drilling technology. All agreements are inter-conditional as an umbrella agreement.

Statoil has divested part of its stake in Blocks 38 and 39 in the Kwanza Basin, offshore **ANGOLA**. It has sold 10% in each block to Ecopetrol...Maersk has written down its assets offshore **BRAZIL** by two-thirds to $0.6bn. This includes divestment of a stake in **POLVO** to operator HRT and a reduction in proven reserves at *Wahoo* and *Itaipu*.

FLOATER NEWS

LLOG FLOATER HOOPLA MAY BEGIN GOM PRODUCTION REVIVAL

From Houston (BN): A recent US Energy Information Administration report shows a persistent decline in oil and gas production from the Gulf of Mexico since 2003 (more about that later), but optimism about the GoM's future permeated LLOG's dockside gala christening of the *Delta House* (SEN, 31/7) fps at Kiewit's Ingleside TX yard.

Speeches were made. The national anthem was played. The almighty's blessings were sought. A champagne bottle broke against the hull of the semi. A good time was had by all who gathered in an air-conditioned tent for lunch and a tour of the platform. Sail-out is set for 27 July.

LLOG CEO Scott Gutterman, speaking to SEN on the sidelines of the event, saw nothing strange between the EIA report and his company's optimism.

'I wouldn't be surprised if there has been a decline, but there have been several very significant discoveries over the last several years that are in various stages of development,' Gutterman said. 'So over the next 10 years, I would be very surprised if we didn't see a major turn in production.'

The 19 June EIA report, updating earlier reviews, was broadly focused on production from federal and Indian lands, but included statistics showing fossil fuel production from federal GoM waters has declined by nearly 50%, to 3,858tn Btu in 2013 from 7,570tn Btu in 2003.

Most of that decline has been due to a 74% drop in gas production, to 30bcm from 119bcm in 2003, partly due to old fields declining and also to lower gas prices.

GoM oil output also has been up and down, despite generally supportive world crude prices. The instability is partly due to E&P delays caused by the 2010 BP oil spill, but also due to the largely forgotten price collapse in 2009.

According to EIA, federal GoM crude and lease condensate output totaled 531mmbbls in 2003, peaked at 584mmbbls in 2010 and fell back to 447mmbbls in 2013. The US Department of Interior (overseer of BSEE and BOEM) has different numbers, as they often do, but the trend is similar.

As Gutterman says, though, with activity returning to more normal levels after the spill and accompanying moratoria, and with several big deepwater projects nearing production startup, the future for GoM oil is anything, but dim.

STATOIL PUTS BRAKES ON AT *CASTBERG*

From the North Sea: Last week, instead of revealing the concept for the *Johan Castberg* (SEN, 31/6) development in the Barents Sea as expected, Statoil dropped a little bombshell by saying that the partners had decided to spend another year making up their minds.

While under pressure from the authorities and local communities to stick to the original concept of an fpu and oil export by pipeline to an onshore terminal, the company clearly favours the less expensive option of an fpso combined with offshore loading.

This dilemma is reflected within the licence group. Petoro, which manages the Norwegian state's licence interests, has made no bones about its preference for the fpu plus terminal option as a means of creating infrastructure which will facilitate the development of other finds in the Barents.

According to Statoil, a terminal would require an investment of NOK10bn ($1.6bn). It has not given costs for the two concepts under evaluation, but early last year, in its EIA proposal, it costed the fpu-pipeline-terminal concept at NOK90bn.

Success with the five-well exploration campaign in the *Castberg* area could have made a difference, but proved disappointing.

'We have not proven enough resources in *Castberg* to make the field viable for supporting infrastructure,' Arne Sigve Nylund, executive vice president for Development and Production Norway, said. *Castberg* reserves are estimated at 400-600mmbbl.

Who's helping?

The government has said that it will provide assistance for the onshore terminal as it did for the Melkøya LNG plant which was built to serve the *Snøhvit* gas field. However it has not firmed up this assertion, and such help would require the approval of ESA, the EFTA Surveillance Authority.

Meanwhile Statoil says its future efforts will focus on three main areas: maturing work on the fpso, while also continuing to work on the fpu; investigating the economics of a stand-alone terminal with oil delivered by tanker; and looking for ways of cuttings costs and updating the resource base.

A delay of about 12 months was also implemented last year following the introduction of a tax hike. It was this which prompted the switch to the fpso concept. Instead of achieving first oil, as originally planned, in late 2018, the project, which Statoil insists it is still committed to, now looks unlikely to come onstream before 2021.

ANADARKO HAS *HEIDELBERG* PLANS DOWN TO FINAL NOTE

From Houston (BN): Anadarko has filed an initial development operations coordination document (DOCD) with regulators detailing its plans for the *Heidelberg* (SEN, 30/16) floater project in the deepwater Gulf of Mexico.

The truss spar, a twin of the one at *Lucius* (30/18), with capacity to handle 80,000b/d and 2.3mcm/d, will be moored in 1,618m in Green Canyon 860, about 325km south-southwest of New Orleans.

Anadarko initially plans six subsea wells - four in GC859 and two in GC903 - tied back to the fps. The topsides are designed for expansion and for future water injection and gas lift to enhance production.

Under the DOCD, Anadarko is targeting installation of the mooring piles, October-November this year; installation of the hull, February-March 2015; removal of work deck and installation of the topsides, October-November 2015; hookup and commissioning, October 2015 to February 2016; and start of production in the same month.

The spar is nearing completion in Technip's Pori, Finland, yard. The topsides are under construction at Kiewit's at Ingleside, Texas.

The *Heidelberg* subsea wells will be tied back to the spar through a series of lease term and right-of-way pipelines, plets, plems and subsea manifolds, terminating at the spar via four 8.625in steel catenary risers. The pipeline system will shut-in according to the guidance contained in NTL 2009-G36. The boarding shutdown valves will close in 45 seconds.

Oil will leave the facility via a 16in export riser and pipeline operated by Anadarko to a plet in GC 816. From there, it will enter an Enbridge-operated pipeline to the *Caesar* system where it will be taken to Ship Shoal 332 to enter the existing *Poseidon* pipeline to Louisiana or the *Cameron Highway* pipeline to Texas.

Gas will be transported via a 16in export riser and pipeline operated by Anadarko to a plet in GC770. From there, the gas will enter Discovery's *Keathley Canyon Connector* pipeline for shipment to South Timbalier 283, where it will enter *Discovery* or *Trunkline* pipelines to shore.

Under the heading of 'new and unusual technology', an entry required by regulators, Anadarko lists *Heidelberg*'s mooring system –

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a 9-pointer consisting of polyester rope and chain and suction piles. It is very similar to systems used to moor other floating production facilities in the GoM, but is still officially considered new.

The oil to be produced is described as 30.3°API gravity and 1.2% sulfur based on a 2012 well test at depths of 8,335 to 8,377m in GC 903.

Anadarko operates the deepwater development (31.5%) for Marubeni (12.75%), Freeport-McMoRan and Eni (12.5% each), Statoil (12%) and Exxon Mobil and Cobalt (9.375% each).

FLOATER/VESSEL BRIEFS

Subsea is not always going to be the winner in the deepwater stakes. SEN has reported in the past about reservoir problems - essentially compartmentalisation - at Maersk Oil's **CHISSONGA** (SEN, 30/14) prospect in Block 16, offshore Angola.

When Maersk went back to the drawing board to find a way to reduce the well count and drilling costs, the answer was dry-tree. A tenders are out for a tension leg wellhead platform and an fpso, a solution not dissimilar to ExxonMobil's *Kizomba*.

Chissonga, in waters of 1,200-1,500m, will be Maersk's first operated development outside Denmark which it has run from beginning to end, ie seismic to operations.

From Australia (RW): Mubadala Petroleum is moving towards first production from the **MANORA** oil development project in block G1/48 in the northern Gulf of Thailand.

The subsea work around the field is now complete. The installations include catenary anchor-leg mooring buoys, risers and tie-ins to the subsea pipeline end manifold.

The remaining scope of the project includes load-out and installation of topside facilities on the wellhead platform and arrival of the fso about now. The fso is undergoing commissioning and acceptance trials as well as final installation of topsides in China.

An Atwood drilling rig is scheduled to arrive on site during August to drill the first two *Manora* development wells.

Production should begin late in the third quarter of 2014. Ultimately the field is expected to produce 15,000b/d from 10 wells at peak with reservoir pressure boosted by five water injection wells.

Discovered in 2009 in 50m some 75km off the Thai coast, the field has estimated 2P reserves of 24mmbbls.

SBM Offshore's fpso *N'Goma* has arrived in Angola at the Paenal yard enroute to its finally mooring location on Eni's **15/06 WEST HUB** (31/2) development and is an example of the commitment to assisting local commercial activity by the international industry.

Paenal, a joint venture between SBM, Daewoo (DSME) and Sonangol, is the biggest employer in the area with 1,200 personnel, more than 1,000 being Angolan. The operations organisation for the fpso OPS is also an SBM-Sonangol joint venture.

The fpso is the unit that formerly was deployed on ExxonMobil's *Xikomba* field in Angola which came off charter three years ago. It has been upgraded to a processing capacity of 100,000b/d, 3.3mcm/d and 120,000bw/d for injection purposes.

SBM continues to operate under the cloud of an alleged $250mn bribery investigation (31/6) with much of the money supposedly paid in Brazil. The good news for the big floater contractor is that Petrobras has reported that it could see profits fall by $15bn over the next five years if it has to cancel its contracts with SBM. There are silver linings.

From Australia (RW): Keppel Offshore Marine has received two orders worth $295mn through its subsidiary companies Keppel Shipyard and Keppel Singmarine.

The shipyard contract is for conversion of a tanker to the fpso *Armada Kraken* for Bumi Armada. The fpso is to be a harsh-environment design suitable for North Sea conditions and capable of producing the heavy oil in the **KRAKEN** field in the UK sector during a 25-year field life.

The fpso will be able to process a peak fluid flow rate of 80,000b/d as well as 275,000bw/d for injection and 0.6mcm/d. Storage capacity will be 600,000bbls. The vessel is scheduled for delivery during the third quarter of 2015.

Keppel Singmarine's contract was awarded by the Baku Shipyard for design, fabrication and outfitting of a subsea construction vessel to be deployed during the Stage 2 work of BP's **SHAH DENIZ** (31/6) project in the Caspian. The dp vessel will support installation of subsea structures with a 750t heave-compensated crane for operations to 600m. The vessel will also have an 18-man two-bell diving system and two workclass rovs.

(*From the editor:* Keppel has also picked up the first ever conversion of a Moss-type LNG carrier to a floating LNG vessel for Golar Hilli. There are options for three more conversions. The first is due for completion in early 2017.)

BW OFFSHORE is looking to simplify its commercial position over the fpso *Petroleo Nautipa* with equal partner Tinworth. They are negotiating over who should buy out who and become sole owner...Premier has begun FEED on its **BREAM** (31/5) project in Norway.

From Australia (RW): Inpex's **ICHTHYS** (31/7) floater-to-LNG development in the Browse Basin off Western Australia has recorded another milestone with its fpso hull recently floated from the dry dock at the Daewoo Geoje shipyard in South Korea.

Prefabricated sections weighing a total of 60,000t were successively lifted into the dry dock and assembled to construct the 336m hull. Work will now begin on the fabrication and integration of the topsides, living quarters and the installation of the turret. The latter is under construction in Singapore.

When completed, the fpso will have storage capacity in excess of 1mmbbls of condensate and have accommodation for a workforce of 200 people.

The project will produce about 100,000b/d of condensate at peak in addition to the 8.4mt/a of LNG from two trains at the facility in Darwin along with 1.6mt/a of LPG. The field lies 200km off the WA coast and has reserves of 340bcm of gas and 500mmbls.

The latest light well intervention vessel **ISLAND PERFORMER** has been delivered to the FTO (FMC-Edison Chouest Offshore-Island Offshore) joint venture which has it chartered in the Gulf of Mexico for the next five years.

Built at Ulstein Verft in Norway, the 130m by 25m X-Bow design has an 8m 300t capacity tower for riserless intervention, a 100t skidding system, a 250t ahc crane and a transit speed of 15kt.

Solstad Offshore has delivered its $250mn newbuild construction support vessel **NORMAND VISION** to contractor Ocean Installer which has it on charter for eight years with options. The vessel which was built by Vard Group is 157m with a 400t subsea crane, a 3,000t below deck carousel and a 150t vertical lay system.

TECHNOLOGY

SIEMENS TAKES THE LONG ROAD TO SEABED ELECTRICS

From Ulverston: Siemens is not expecting to hit the jackpot in the short term with its 'subsea grid' seabed electrification technology. The German industrial giant's plunge into the subsea market, as befits one of the biggest industrial conglomerates, has been measured. It is in it for the long haul.

Siemens looked at key components for its grand scheme and two years ago acquired The Connector Company Formerly Known As Tronic from Expro. It has used the UK northwest specialist, now known as Siemens Subsea, as sort of a front-man with a sector that probably does not know Siemens well.

While the connector company makes a range of products, it is the high and low voltage power connectors that are the key to what Siemens wants to do on the seabed. It might have gotten to get an early look if Norske Shell's *Ormen Lange* (SEN, 31/4) seabed compression project had gone ahead. Siemens Subsea would likely have secured some of the connector supply on that job.

While Siemens has a grand vision for seabed electrification, as do others like Statoil, GE Oil & Gas, Schneider, et al, there are interims steps to take along the way. These include direct electric heating of pipeline and seabed variable speed drives for pumps, the latter with pressure control electronics.

There have also been supplies to the other two seabed compression projects, both operated by Statoil - 5Kv and 10Kv connectors for *Åsgard* and topside drives for the wet gas compressor at *Gullfaks*.

It is hard to talk about subsea equipment without standardisation coming up. In the context of Subsea Power Grid, this means a CMI, or common module interface, which can be used for wet and dry connections.

LAKE DISTRICT BITS: Without going into the long background of the Siemens Subsea-cum-Tronic involvement in the development of fibre optic connectors - ie electro-optical connectors and later only 4-fibre connectors - it is now looking to jump over the competition with a 12-fibre connector which is due to be in the market at the end of next year.

One big issue for Siemens would always have been the marinisation of its electrical gear for seabed installation. This has been done in Trondheim and with its Norwegian subsidiaries, Bennex and Poseidon.

With much talk about 20K systems and production, the connector company has been working on 20K penetrators.

With various international standards about, testing here is always done to the most stringent which is on quite a few occasions means NORSOK, ie Norwegian.

SUBSEA IS IN THE FUTURE FOR HEAVY OIL

From Aberdeen (IF): A Statoil executive says the solution to economically developing smaller offshore heavy oil deposits in the UK and worldwide will require maturing cost-efficient subsea technology.

Ingolf Soreide, head of the *Mariner* (SEN, 30/20) development in the UK North Sea, also highlighted how important heavy oil would be in British waters. He was speaking at the recent SPE European Artificial Lift Forum here.

The vice-president said that Statoil has built a strong position worldwide in heavy oil, both onshore and offshore and will factor largely in the UK's future.

Of new field developments planned, heavy oil reservoirs are expected to account for around 25% of production by 2022. There are 19 heavy oil discoveries in the UK with in-place resources totalling 9bnbbls.

The veep said that, hand in hand with heavy oil, is the need for reliable artificial lift.

Statoil, with its partners JX Nippon and Dyas, are making a £4bn investment in *Mariner*, a field that was first recognised on seismic in 1977 and discovered by drilling in 1981. Soreide said the long period from exploration to development typifies the challenge in bringing heavy oil fields to market.

'*Mariner* has proved a challenging field (with) one of the largest undeveloped hydrocarbon deposits...almost 2bnbbls...in two main reservoirs,' he said. 'Work on...development scenarios under Statoil...first started in early 2008, right after entering into the licence as operator. The...development was finally sanctioned...in December 2012.'

Soreide was asked why offshore heavy oil was so difficult to develop. He said lower recovery factors typify heavy oil developments.

SEN Online Glossary of Terms - click here

'With the large investment...necessary...it is ...key to extract as much oil as...viable. Statoil has concentrated on...technologies to facilitate...production...these...include steam assisted gravity drainage, polymer flooding, water alternating gas, advanced horizontal and multilateral wells including autonomous inflow control devices and fast reservoir model update techniques. '

The solution here includes esps combined with diluent downhole injection and a novel workover rig for changing out esps.

Soreide said applying advanced artificial lift to subsea applications will help unlock smaller deposits and those in deeper water. EOR technologies, such as polymer flooding, will also play an important part.

Statoil also operates *Bressay* (30/18) here and is currently looking at ways of developing it. The Statoil veep said heavy oil expansion exists with *Mariner East* and others in the same area. The company is also stepping up exploration activity and is planning its first operated wildcat in UK waters next year.

POLICY

OIL & GAS POLICY MUST LOOK BEYOND TAX REVENUE

From Aberdeen (IF): Radical fiscal and regulatory change are an 'absolute necessity' to ensure remaining reserves on the UK Continental Shelf are fully exploited.

That is the view of the oil and gas commission set up by the Scottish government to inform the debate before the Scottish referendum on independence in September.

Commission chairman Melfort Campbell said, 'The over-riding message is that we must no longer assess the value of the UKCS on tax take from production profits, but on the total value generated in the economy.

'The result of doing this should lead to the recovery of the highest reserve estimates – around 24bboe – and maximum value...for the economy. This does...require us to fully understand and...quantify the total value added, where and how it arises and how it is impacted by tax and licensing conditions.'

The commission's report warns that the industry has reached a 'critical crossroads' with the current record levels of investment masking a decline in spending on exploration and development, which will result in markedly reduced activity, harming both future production levels and total recovery.

It concludes that a step-change in stewardship philosophy through an overhaul of the fiscal and regulatory regimes, is urgently needed to achieve maximum value, recovery and longevity from the remaining life of the UKCS.

The immediate challenge for government, says the report, is to steer a path towards a targeted fiscal framework which is stable, predictable and internationally competitive.

Campbell said there is inadequate returns for operators, reduced income for the Treasury and the loss of added value through the supply chain and into the wider economy.

The recent Wood Review (SEN, 30/23) on maximising recovery in the UKCS is said to have provided a starting point for the report. Campbell said the review provides the means for creating opportunity. He said future aims should be optimal recovery, skills development, R&D and technology development and growth in the supply chain.

Scottish Energy Minister Fergus Ewing said the Scottish government agrees that a fundamental shift in policy is long overdue, and that basing it on total value added is central to fulfilling the sector's potential.

But UK Energy Minister Michael Fallon has criticised the report as 'copycat stuff' and said the Scottish government would struggle to offer a more favourable tax regime.

The Scottish Government still faces an uphill battle to win control of resources in waters north of the border. A new poll commissioned by Scottish entrepreneur Sir Tom Hunter found 32% of voters support independence, 46% are against and 22% don't know. Bookmaker William Hill makes a 'no' vote a red-hot 1/7 certainty.

PRESSURE MOUNTS FOR INDEPENDENT HELICOPTER ENQUIRY

From Aberdeen (IF): The UK government is under fresh pressure to hold a public inquiry into North Sea helicopter operations. The parliamentary transport select committee report this week called for an independent probe on offshore helicopter safety.

The report said that while 'helicopter transfer across the North Sea has inherent risks', it is the most practical mode of transport for the offshore industry. Nonetheless 'five accidents since 2009 have led to a loss of confidence ...that will be difficult to remedy'.

Safety groups and operators have worked to rebuild confidence, but more needs to be done, the report said and added that members were 'disheartened' to learn of 'a macho bullying culture in the industry.'

The committee welcomed the Civil Aviation Authority review into offshore helicopter safety, but that the CAA did not look in detail at two key areas of operations.

The first is the industry's highly-competitive environment. Commercial sensitivities ensure that it is difficult for external reviews to examine contractual obligations set by industry. The second was the role and effectiveness of the CAA itself.

The CAA said in a statement that any loss of life in aviation accidents is always tragic and the safety of those who rely on offshore helicopter flights is the absolute priority.

Oil & Gas UK's health and safety director Robert Paterson said safety is a key priority for the industry and it never stops working to make the workforce safer.

'We have yet to see any evidence,' Paterson said, 'of the unsubstantiated allegations concerning improper commercial pressure affecting safety outcomes which are repeated in this report...if anyone has evidence of commercial issues overriding good safety practices, they must report this immediately.'

BUSINESS

MOL SNATCHES PREMIER UK ASSETS IN GROWTH SPURT

From Aberdeen (IF): New UK North Sea entrant has announced its second significant acquisition here with more expected to follow soon. MOL Group (SEN, 31/7) is to spend $130mn buying stakes in six central North Sea licences from Premier Oil.

The portfolio includes non-operated interests in the *Scott* (21.84%), *Rochelle* (15%) and *Telford* (1.59%) fields, as well as interests in further exploration licences such as the *Rochelle Upper Jurassic Deep* prospect.

Last December, MOL announced it was spending $375mn on acquiring 14 UK licences from Wintershall. These included non-operating stakes in *Broom* (29%) as well as the *Catcher* (20%), *Cladhan* (33.5%) and *Scolty/Crathes* (50%) developments.

Premier chief executive Tony Durrant said the sale will allow his company's UK team to focus on its operated *Solan* (31/x) and *Catcher* (31/x) projects. It was a further step towards achieving targeted disposals for the year.

More deals are anticipated by MOL in the near future as it wants to operate producing assets here by next year.

Chris Bird, MD of MOL UK, told SEN last month that planned capital investment of more than $1bn was just the starting point.

'Within three years, we want to be a significant player on the UKCS in terms of production rate and capital spend to build the business,' he said.

Bird said MOL is working on four or five possible key transactions. MOL has around $5bn of finance to fund growth globally.

SUBSEA 7 HAS TO PLAY VESSEL GAME

From Houston (BN): Subsea 7 is having to jump through a somewhat arcane American legal hoop that has led to disclosure of its plan to send the pipelaying vessel *Navica* and the construction vessel *Borealis* into the Gulf of Mexico to work on unnamed projects for unidentified clients.

S-7 has already been working in the Gulf, but this will be the first time since its merger with Acergy three years ago that it will send vessels it actually owns into US waters.

Previous work was done using chartered vessels owned by third parties. To send the *Navica* and *Borealis* into US waters, S-7 needs letters of exemption under American law.

To qualify for the waivers, S-7 had to have two of the three US-citizen directors on its seven-member board resign. The move aimed to eliminate any possibility of US-citizen control of S-7 decision-making - say, if three Americans and one other board member joined to outvote the other three board members - which would disqualify it from the waiver programme.

Foreign companies controlled by American citizens cannot participate, a prohibition aimed at preventing companies from gaming the system. All of which is really legalistic minutiae to SEN, which would rather know which projects and which companies are bringing *Navica* and *Borealis* to the GoM. S-7 is not saying.

One thing a company spokesman did say: the recently announced contract awards for installation work for BP and Freeport-McMoRan do not involve either of the mentioned vessels. S-7 has said construction flexlay vessel *Seven Seas* will be working for Freeport-McMoRan in the GoM and, if that plan holds, S-7 will need another letter of exemption, the spokesman said.

BUSINESS BRIEFS

Norwegian equity fund Viking Venture has taken a 40% stake in flexible riser specialist **4SUBSEA**. This is the second time that Henning Christensen has been able to sell his specialty company. Christensen was the top man at Seaflex before Kongsberg Gruppen acquired a 62% stake back in 2002. 4Subsea has grown nearly fourfold in the last five years with turnover last year at NOK106mn. 4Subsea joins Viking's portfolio of oilfield companies which includes risk and reliability specialist ExproSoft, drilling system designer Ocean Riser Systems, well completion and data monitoring company Ziebel and Zilift which provides artificial lift solutions.

AKER SOLUTIONS is moving 200 personnel from its maintenance and modification division into a subsea engineering centre in Stavanger under the moniker Aker Advantage. It has already signed contract with Statoil to provide engineering expertise. The move has been carried out as a result of a slowdown in MMO work in Norway.

Congrats! **Neil Mackintosh** - Mac to his friends - has just been named president of subsea/pipeline specialist INTECSEA in Houston. Mac who had been head of Genesis' office in Houston is a well-known 'pipeline' specialist - NOT! Best of luck.

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