

OILFIELD TECHNOLOGY

EXPLORATION | DRILLING | PRODUCTION DECEMBER 2016

Surface Logging Solutions for Drilling Optimisation

GEOLOG's integrated solutions resolve operational risks at a fraction of downhole measurement costs

GEOLOG
SURFACE LOGGING

IS FLOTEK IN YOUR WELL?®

ENERGY CHEMISTRY TECHNOLOGIES

DRILLING TECHNOLOGIES

PRODUCTION TECHNOLOGIES

www.flotekind.com

DRILLING & COMPLETION

Cement Additives:

improves cement performance and bonding for better zonal isolation.

Casing Accessories:

ensure the integrity of the well construction and cementing operations.

Drilling Chemicals:

Increase drilling speed, efficient cuttings removal and reduce downtime.

STIMULATION & PRODUCTION

Production Chemicals:

fewer interventions and more production.

Drilling Motors:

vertical and directional motors with Sealed Bearing and Mud Lube configurations.

Downhole Drilling Tools:

full range of drill string components to make drilling more efficient and reduce non-productive time.

Teledrift Measurement While Drilling:

continuous measurements to surface while drilling, satellite-based remote monitoring and certification for faster and more accurate drilling.

Stemulator:

improve penetration rate by inducing axial vibration in the drill string to reduce friction drag and sticking.

Stimulation Chemicals:

increase load recovery, hydrocarbon production, lower pumping friction and increase ROI.

Artificial Lift:

novel pump systems, reliable support to help lower cost, improve reliability and deliver more production.

Contents

December 2016
Volume 09 Issue 12

03 Comment

05 World news

10 On the road to recovery

Marina Ivanova, Douglas-Westwood, UK, gives an insight into the long term opportunities for the global upstream industry.

15 Working without well data

Nathalie Lucet, Louis Cherel, Beicip-Franlab, and Wissam Chbat, Lebanon Petroleum Administration, explain how seismic reservoir characterisation can be achieved without well data.

19 Adapting to the new norm

Maurillio Addario, READ Cased Hole, UK, introduces a logging while working solution designed to meet industry demand for cost-efficient technologies.

23 Working in sync

Michael Konopczynski, Tendeka, USA, discusses the synergy between sand control screens and inflow control devices.

27 Heavy artillery

Adam Schmidt, The GasGun Inc, demonstrates how a stimulation tool can blast through nearbore damage and improve production in Colombia's heavy oilfields.

31 Guiding strategic change

Sebastien Matringe and Jeremy Brown, Quantum Reservoir Impact, present new technologies that increase asset performance.

35 Low density freeze

Cliff Meade, Carlo Mazello, Wild Well Control, and Kyle Combs, Jeff Watters, David Brown, Larry Watters, CSI Technologies, describe the technology behind a new low-density freezable fluid, for use as a barrier in well freezing applications.

39 Surfactant selection

Brian Mueller, Linh Do and Oladapo Adejare, Nalco Champion, Wellchem Technologies, USA, describe a methodology for effectively determining the optimal surfactant treatment for hydraulic fracturing operations.

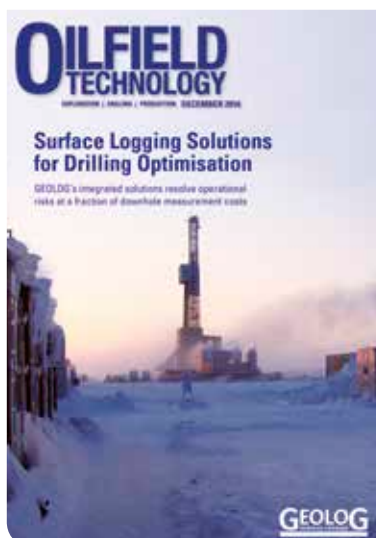
44 The unsung heroes of oil spill remediation

Tony Gutierrez, Heriot-Watt University, UK, discusses the future for combatting oil spills at sea with the help of microbes and carefully selected dispersants.

Front cover

GEOLOG, through the use of computer modelling, technology miniaturisation and ruggedisation, routinely brings accurate measurements, previously unavailable at the wellsite, to resolve issues that previously only downhole technologies could solve. The current demand for cost reductions has resulted in the recognition of the increased value of surface measured analyses.

GEOLOG's integration of solutions, including its patented DrillClean borehole stability and BitLife, bit metamorphosis and wear services helps operators reduce drilling costs.



More from **OILFIELD TECHNOLOGY**

OT Read on the go
App available on Apple/Android

Follow us on Twitter
@OilfieldTechMag

Connect on Google+
Oilfield Technology

Join us on LinkedIn
Oilfield Technology

Like us on Facebook
Oilfield Technology

ISSN 1757-2134

Freeze Fluid In Its Tracks

CRYOGENIC FREEZE



FEELING THE HEAT?

Wild Well cryogenic freeze services create a pressure testable barrier to allow safe work at the wellhead for any amount of time. Available for all tubing and casing sizes, our freeze stops fluid in its tracks so you can get your equipment working again.



Comment

December 2016

Contact us



David Bizley, Editor
david.bizley@oilfieldtechnology.com

The upstream industry has been gifted something of an early Christmas present this year. After months of negotiations, OPEC members and, importantly, Russia have agreed to make substantial cuts to crude oil production in a bid to combat the “serious challenge of imbalance and volatility”¹ in the market.

Every OPEC member is to take part in the cuts with two notable exceptions: Indonesia and Iran. Indonesia decided to suspend its membership of the group as its position as a net importer of crude oil made cuts to its domestic production untenable – its share of the cuts is to be shared over the rest of the group. Iran, by contrast, was actually allowed to boost production by some 90 000 bpd in order to recoup production shortfall sustained under US/EU sanctions.

Highlights include: Saudi Arabia cutting back by just under 500 000 bpd, the UAE, Kuwait and Qatar cutting back by a combined 300 000 bpd and even Iraq, which had previously insisted on higher output quotas, cutting back by 200 000 bpd.² And to top it all off, Russia has chipped in with Energy Minister, Alexander Novak, stating that “Russia will gradually cut output in the first half of 2017 by up to 300 000 bpd”.³ Other non-OPEC members, such as Azerbaijan have also hinted at taking part in the cuts.

On the back of the agreement, the price of Brent crude leapt up and was sitting at over US\$52/bbl as of 1 December while markets saw record levels of futures trading.⁴ In total, the cuts come to approximately 1.2 million bpd, which is towards the upper end of what analysts had been expecting. In all, the agreement is about as much as could have been realistically hoped for and (at least on paper) goes some way to addressing the oversupply that has suppressed prices for the last two years. What remains to be seen now is whether OPEC members (and others) actually stick to their new quotas.

Changing the topic slightly: Donald Trump has won the US presidential election and will be officially sworn in as President of the United States in January. As of yet, it's not entirely clear how a Trump presidency will effect the US upstream industry; the President-Elect has offered a range of comments and policy outlines on energy, some of which would likely help the industry and others that would likely hinder it.

For example, Trump has promised to revoke the Iranian nuclear deal established by the Obama administration; reinstating sanctions on Iranian oil would likely see a healthy boost to oil prices (especially when combined with the OPEC agreement). However, Trump has also stated an intention to cut back on red tape and lift restrictions on oil production from federal lands, the GoM, and the Arctic.⁵ These certainly sound like pro-industry actions, but they run the risk of allowing another supply glut to form and suppress prices. In short, the proposals we've seen so far look set to raise both supply and demand. When asked about the likely impact of a Trump administration on the US oil industry, Thomas Pugh of Capital Economics stated that: “The net effect of a Trump presidency could be relatively limited.”⁶

Whichever way things go, 2017 promises to be very interesting indeed – both within the upstream industry and beyond. The *Oilfield Technology* team wish you all a happy and prosperous new year. ■

References

1. 'AGREEMENT' – http://www.opec.org/opec_web/static_files_project/media/downloads/press_room/OPEC%20agreement.pdf
2. Ibid.
3. 'OPEC in first joint oil cut with Russia since 2001, Saudis take 'big hit' – <http://www.reuters.com/article/us-opec-meeting-idUSKBN13P0JA>
4. 'Oil prices surge, trading volume records smashed as OPEC and Russia agree output cut' – <http://www.reuters.com/article/us-global-oil-idUSKBN13Q35H>
5. 'Donald Trump is a double-edged sword for oil' – <http://money.cnn.com/2016/11/16/investing/donald-trump-oil-prices>
6. Ibid.

Editorial

Managing Editor: **James Little**
james.little@oilfieldtechnology.com

Editor: **David Bizley**
david.bizley@oilfieldtechnology.com

Editorial Assistant: **Louise Mulhall**
louise.mulhall@oilfieldtechnology.com

Design

Production: **Charlotte Reynell**
charlotte.reynell@oilfieldtechnology.com

Sales

Advertisement Director: **Rod Hardy**
rod.hardy@oilfieldtechnology.com

Advertisement Sales Executive: **Ben Macleod**
ben.macleod@oilfieldtechnology.com

Business Development Manager: **Chris Lethbridge**
chris.letbridge@oilfieldtechnology.com

Website

Website Manager: **Tom Fullerton**
tom.fullerton@oilfieldtechnology.com

Website Editor: **Callum O'Reilly**
callum.oreilly@oilfieldtechnology.com

Digital Editorial Assistant: **Angharad Lock**
angharad.lock@oilfieldtechnology.com

Marketing

Subscriptions: **Laura White**
laura.white@oilfieldtechnology.com

Reprints:
reprints@oilfieldtechnology.com

Palladian Publications Ltd,
15 South Street, Farnham, Surrey GU9 7QU, UK
Tel: +44 (0) 1252 718 999 Fax: +44 (0) 1252 718 992
Website: www.oilfieldtechnology.com

Subscription

Oilfield Technology subscription rates: Annual subscription £80 UK including postage/£95 overseas (postage airmail). Two year discounted rate £128 UK including postage/£152 overseas (postage airmail).

Subscription claims: Claims for non receipt of issues must be made within three months of publication of the issue or they will not be honoured without charge.

Applicable only to USA & Canada: OILFIELD TECHNOLOGY (ISSN No: 1757-2134, USPS No: 025-171) is published monthly by Palladian Publications, GBR and is distributed in the USA by Asendia USA, 17B S Middlesex Ave, Monroe NJ 08831. Periodicals postage paid New Brunswick, NJ and additional mailing offices.

Postmaster: Send address changes to Oilfield Technology, 701C Ashland Ave, Folcroft PA 19032.

Final data
available
December 2016

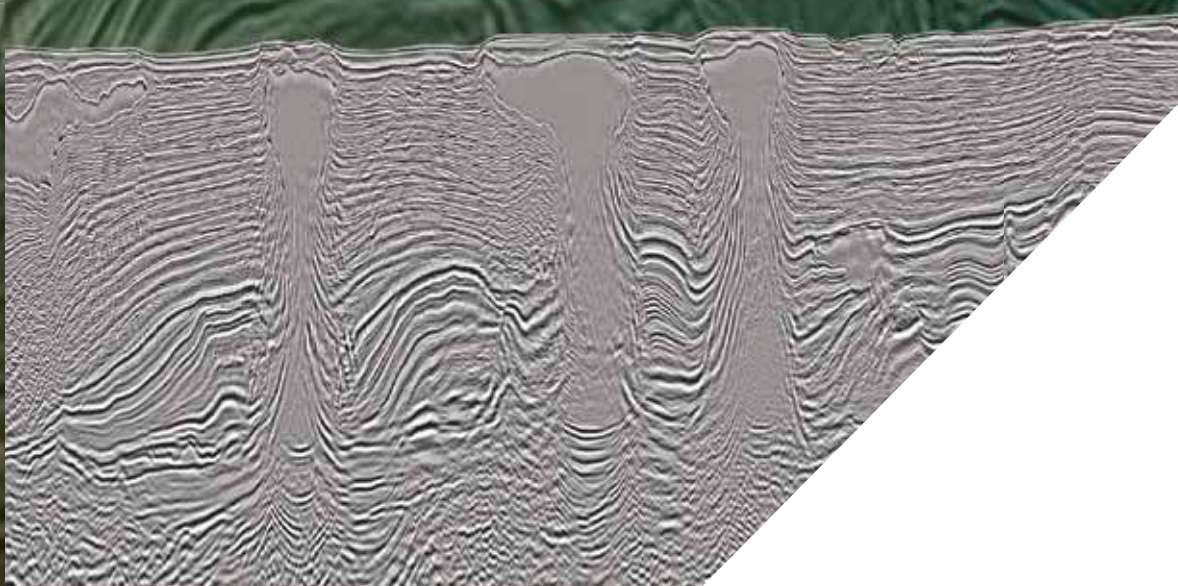
Set your sights.

Gulf of Mexico

Declaration WAZ 3D covers 8,884 km² (381 OCS blocks) in the Mississippi Canyon, DeSoto Canyon, and Viosca Knoll protraction areas of the Central Gulf of Mexico and was acquired to better image deep structural elements while improving subsalt and salt flank illumination.

Through integration with TGS' underlying orthogonal Justice WAZ 3D survey, Declaration provides broadband multi-azimuth (M-WAZ) data with offsets to 16 km. The data is being processed using the latest TGS imaging technology including Clari-Fi and Orthorhombic migrations. Final data will be available by December 2016.

Let's explore.



See the energy at TGS.com



© 2016 TGS-NOPEC Geophysical Company ASA. All rights reserved.



World news

December 2016

Saudi Arabia to bear the brunt of OPEC production cut

OPEC has agreed to its first cuts on oil production since 2008, as Saudi Arabia finally accepted to curb its production whilst conceding that arch rival Iran will be made exempt from any cuts. This effectively means that OPEC will reduce production by 1.2 million bpd to 32.5 million bpd. Following the announcement Brent crude futures spiked 8% to more than US\$50/bbl after Riyadh announced it had finally reached a compromise with Iran.

The agreement is also likely to call for a reduction of about 600 000 bbls a day by non-OPEC countries. US bank Morgan Stanley said that the OPEC agreement could boost crude prices by US\$5 or more. While the deal is unlikely to be enough to wipe out the crude glut entirely – according to OPEC's own estimates it needs to pump just 31.9 million bpd from January to June to balance supply and demand.

However, analysts have warned that it is still too early to be overly optimistic, reinforcing that despite the agreed deal, there are still some doubts over the efficacy of the cut. A source at Barclays interviewed by Reuters said, "This is an agreement to cap production levels, not export levels [...] The outcome is consistent with [...] what OPEC production levels were expected to be in 2017 irrespective of the deal reached."

In addition, Morgan Stanley has said that, – "scepticism remains on individual countries' follow-through (on the cut), which is keeping prices below year-to-date highs (of US\$53.73/bbl in October) for now."

Despite the jump in prices, they have still only reached September-October levels – when plans for a cut were first announced – and prices remain at less than half their mid-2014 levels, when the global downturn began. ■

KCA Deutag awarded UK North Sea drilling contracts

KCA Deutag has announced that it has sold its jack-up drilling unit, the *Ben Rinnes*, to an integrated energy and services company for an undisclosed sum.

Built in Clydebank, Scotland in 1973 and acquired by KCA Deutag in 2005, the *Ben Rinnes* was under contract offshore Angola until February of this year. The ABS Classed Marathon Le Tourneau MLT 53-S enhanced rig has been stacked in Gabon since then.

Norrie McKay, KCA Deutag CEO said: "Whilst the sale of the *Ben Rinnes* is an important milestone for KCA Deutag as it is our last asset in our mobile offshore drilling fleet, we continue to maintain the competence and experience required to support offshore drilling unit operations. This expertise is currently supporting the construction and start-up of two Category J jack-up rigs which will commence operations on the Norwegian Continental Shelf next year. ■

Aker BP awards DNV GL new frame agreement

Aker BP has awarded a new frame agreement to DNV GL, covering a wide range of safety, verification, inspection and classification services across its installations on the Norwegian Continental Shelf.

The five-year contract, which includes options for extension, will see DNV GL experts integrated into Aker BP's organisation to provide decision-making support and stand-alone assessments.

"This contract represents an important step forward in DNV GL's long relationship with BP Norway and Det norske oljeselskap, as the companies merge to form Aker BP," said Kjell Eriksson, regional manager, DNV GL.

"The integrated technical assurance and advisory services included in the frame agreement will bring efficiency gains to Aker BP through a blend of state-of-the-art technology and deep technical expertise across a broad range of disciplines." ■

In brief

Senegal

FAR Ltd and its Senegal joint venture partners have agreed to a drilling programme for 2017 consisting of two appraisal wells on the world class SNE oilfield. The wells will be drilled in order to optimise the SNE field development plan before submission to the Government of Senegal for approval.

Liberia

COPL has announced that ExxonMobil Exploration and Production Liberia Limited, an affiliate of ExxonMobil, has commenced drilling operations on the Mesurado-1 exploration well on 22 November, 2016 utilising the Drillship Seadrill West Saturn. The Mesurado-1 well is located about 50 miles offshore Liberia on Block LB-13 in approximately 2500 m of water. The well, targeting oil in Late Cretaceous sands is the first well operated by ExxonMobil offshore Liberia.

Caspian Sea

Lukoil has completed the drilling of a third well at the V. Filanovsky field in the Caspian Sea. The horizontal section of the well is 1217 m long. The well flow is around 3000 t of crude oil per day. The field's total oil production currently amounts to approximately 9000 tpd.

The V. Filanovsky field, discovered by Lukoil in 2005, is the second field commissioned by the company in the Russian offshore sector of the Caspian Sea. The field's recoverable reserves, under the Russian classification, are estimated at 129 million t of crude oil and 30 billion m³ of gas. The annual oil production at the plateau is estimated at 6 million t.



World news December 2016

Diary dates

01- 03 February, 2017

Subsea Expo

Aberdeen, UK

E: events@subseauk.com

www.subseaexpo.com

21- 23 February, 2017

IP Week

London, UK

E: ipweek@energyinst.org

www.energyinst.org/events/ip-week

22- 24 February, 2017

AOG

Perth, Australia

E: aog@infosalons.com.au

www.aogexpo.com.au

06 - 09 March, 2017

MEOS 2017

Manama, Bahrain

E: fawzi@aemallworld.com

www.meos17.com

14 - 14 March, 2017

SPE/IADC

The Hague, The Netherlands

E: dguest@spe.org

www.spe.org

Web news highlights

- ▶ Jacobs wins contract from Shell for Gulf of Mexico platform
- ▶ OPEC cuts; shale positioned to grow with offshore continuing to be the victim
- ▶ CGG delivers final PreSDM data sets for Gabon South Basin multi-client survey

To read [more](#) about these articles and for more event listings go to:

www.oilfieldtechnology.com

GDC drills, cases and cements upper La-107

Gaz du Cameroun S.A. (GDC) has announced that following the spudding of well La-107 in November, it has successfully drilled, cased and cemented the uppermost section of the well to a depth of 400 m. Operations on La-107 were then suspended as planned and the rig was skidded a distance of 10 m along the rail system to the La-108 well location. The 1500 HP Komako 1 drilling rig, owned and operated by Savannah Oil Services Cameroon S.A., is a rail-mounted drilling rig and can skid between the two wells in a matter of hours.

Well La-108 was spudded on the 12 November 2016 and has been drilled and cased to a depth of 400 m. Currently, Savannah is drilling the 17.5 in. hole section on La-108. The gas bearing target horizons, from which it is anticipated both new wells will produce, are in the Upper Cretaceous (Campanian and Santonian) Logbaba Formation, which is a thick sequence of interbedded sands and shales found at depths between 1700 m and 3200 m below the surface. ■

BP buys interest in Egypt's Zohr gas field

BP has announced that it has agreed to buy from Eni a 10% interest in the Shoroul concession offshore Egypt, which contains the super-giant Zohr gas field, for US\$375 million.

BP will also reimburse Eni for BP's share of past expenditure.

As part of the agreement, BP also has an option before the end of 2017 to buy a further 5% interest in the concession under the same terms.

Bob Dudley, BP group chief executive said: "This interest in a truly world-scale asset will complement our existing Egyptian business. We already have a strong partnership with Eni in Egypt and look forward to working with them efficiently bring these important resources to the Egyptian market."


"BP has now been in Egypt for over 50 years and we continue to see opportunities to further develop our extensive activities here. Beyond Zohr, the first phase of our major West Nile Delta project is on schedule to begin production next year and the fast-tracked development of the Atoll gas field is expected to come on stream in 2018." ■

Baker Hughes to create new land pressure pumping company

Baker Hughes Incorporated, CSL Capital Management and West Street Energy Partners (WSEP), a fund managed by the Merchant Banking Division of Goldman Sachs, has announced an agreement to create a pure-play North American land pressure pumping company. The new company will leverage operational experience and industry expertise to provide customers with leading hydraulic fracturing and cementing services supported by the current Baker Hughes world-class technology portfolio.

Under the terms of the agreement, Baker Hughes will contribute its North American land cementing and hydraulic fracturing businesses, which comprises assets in the US and Canada. This includes personnel, expertise, technology and infrastructure. Upon closing, CSL Capital Management will contribute its Allied Energy Services platform, which provides hydraulic fracturing and cementing services on land in North America. Further, CSL Capital Management and WSEP will together contribute US\$325 million in cash to the new company, of which US\$175 million will be used to strengthen its balance sheet and position it for growth, while the remaining US\$150 million will go to Baker Hughes. CSL Capital Management and WSEP together will own 53.3% of the new company, and Baker Hughes will retain a 46.7% ownership stake. The new company will operate under the BJ Services brand and will be headquartered in Tomball.

"The proposed transaction will create a pure-play pressure pumping competitor for the benefit of shareholders, customers and employees," said Martin Craighead, Chairman and Chief Executive Officer of Baker Hughes. ■



BLACK SHARK

WELLBORE INTERCEPT
SYSTEM

Deployed via wireline, the BlackShark tool identifies the exact distance and direction from the relief well to the target well, delivering ranging data up to 200 ft from the target well. When speed and accuracy matter most, the BlackShark Active Ranging System is the ultimate relief well and plug and abandon solution.



Scientific Drilling

www.scientificdrilling.com/magneticranging/blackshark



World news

December 2016

Faroe Petroleum submits Oda field development plan

Faroe Petroleum has announced that the partners in the Oda (previously named Butch) field (licence PL 405) have submitted the Plan for Development and Operation (PDO) to the Norwegian Ministry of Petroleum and Energy.

The Oda field (Faroe 15%) was discovered in 2011, in the Norwegian North Sea, in shallow water approximately 13 km east of the producing Ula field (Faroe 20%). The proposed development will include a 4 slot seabed template with two production wells, and a one water injection well, which will tie back to the Ula platform. Oil will be transported via the Norpipe system to the Teesside Terminal in the UK, while the gas will be sold at the platform to Ula for re-injection into the Ula reservoir to improve recovery.

This subsea tie-in presents an innovative solution by reusing the existing Oselvar infrastructure (Faroe 55% and operator) from the Ula platform. Production from Oselvar will cease in order to allow Oda production to commence and the Oselvar owners will be compensated accordingly.

The Oda partnership (which includes Centrica Norge (Operator 40%), Suncor Energy Norge (30%) and Aker BP (15%)) has worked over the last two years to reduce investment costs by over 40%. Expected investment has been reduced to around NOK 5.4 billion (Faroe net £82 million), with production scheduled to commence in 2019.

2P reserves from Oda are estimated to be 42 million boe, of which 95% is oil and peak production is anticipated to be around 35 000 boe/d (Faroe net 5250 boe/d).

Graham Stewart, CEO of Faroe Petroleum commented:

"Oda is another outstanding example of the exploration success Faroe has had in Norway. I am very pleased to announce that the development plan for the Oda field has now been submitted, signifying an important step for Faroe's future production growth." ■

Hydro Group expands presence in Asia

Hydro Group Plc has reported record growth since financial year 2014/15 within its Asian division, due to impressive demand from domestic markets.

The company announced significant growth in its Asia market activity, with a 300% increase in turnover from US\$700 000 SGD to more than US\$2 million SGD over the past two financial years to 31 March 2016.

Particular highlights have included exploring and targeting new regions, resulting in strategic contract wins within the Korean market. The contracts mean Hydro Group Asia is on course to meet its turnover target of US\$2.5million SGD for 2017.

Doug Whyte, Hydro Group managing director, said: "The industry has been facing unpredicted challenges, with operators and service companies alike adjusting to a new, lower oil price. Our Singapore base has been influential in identifying new opportunities, which have not only supported in expanding our service offering to new clients, but led to our most successful financial year to date." ■

Hurricane to use FPSO at Lancaster Field

Hurricane has announced that it has signed Heads of Terms with Bluewater Energy Services (BES) for the use of the *Aoka Mizu* FPSO on the company's Lancaster field, West of Shetland.

Hurricane intends to use the *Aoka Mizu* for the early production system (EPS) phase of development and will have the right to extend the contract for up to ten years. Under the Heads of Terms, BES has granted Hurricane an exclusive right to enter into fully-terminated agreements until November 2017. It is the parties' intention to enter into fully terminated agreements prior to Hurricane's expected sanction date in mid 2017.

The Heads of Terms sets the scope of work required to ensure the *Aoka Mizu* meets Hurricane's requirements for deployment at Lancaster. In addition, the Heads of Terms also sets out the commercial terms between BES and Hurricane, both for the cost and terms of the upgrade and life extension work and the subsequent charter rates during the expected life of the contract. ■

Nostra Terra acquires interest in Pine Mills

Nostra Terra has announced the acquisition of an 80% Working Interest in certain oil and gas interests comprising the Pine Mills oilfield and associated assets in Wood County, Texas, which has been completed. Nostra Terra purchased the assets from GFP Texas Inc., which has exercised its pre-emption rights following the proposed sale of Pine Mills by its previous owner and operator, Cue Resources LLC.

In consideration for the purchase, Nostra Terra has paid US\$1 025 000 to complete the acquisition, which has been majority financed from existing cash resources with the balance from a Director loan facility.

Pine Mills is a 2400 acre producing oilfield, currently producing an average of 100 bpd (gross). Pine Mills is cash flow positive and has no legacy or other spending commitments attached to it. ■

Emerson helps KOC maximise reservoir assets

Emerson Automation Solutions has announced that it has supplied its Roxar RMS™ reservoir modelling software to Kuwait Oil Company (KOC). The new licenses will be used to build more accurate and detailed reservoir models. The new contract expands KOC's previously purchased Roxar RMS software, which has provided crucial input to KOC in well placing and determining the wellbore trajectory in the most potentially productive parts of the reservoir as well as reducing the geosteering risk for sidetracked wells.

Roxar RMS software helps operators accelerate the field development planning cycle by allowing multiple disciplines to collaborate on a common reservoir model. The software also facilitates the implementation of the Big Loop™ solution, an automated workflow that tightly integrates static and dynamic domains. ■

I MicroGuide™

Avoid Costly Workovers.
Get It Right **The First Time.**



gyrodata

ON THE ROAD TO RECOVERY

MARINA IVANOVA, DOUGLAS-WESTWOOD, UK, GIVES AN INSIGHT INTO THE LONG TERM OPPORTUNITIES FOR THE GLOBAL UPSTREAM INDUSTRY.

The soon to be released 'Upstream Investment Outlook' from Douglas-Westwood offers insights into the principal challenges and opportunities currently facing the upstream oil and gas industry. The report paints a picture of continuous oversupply in the near-term, driven by projects sanctioned prior to the downturn. The long-term outlook presents a more positive view, featuring key growth opportunities in the energy sector.

Late September saw unexpected OPEC discussions of a preliminary output cut, which led oil prices to rally by US\$2.94 to US\$48.43/bbl on 29 September, according to data provided by the US Energy Information Administration (EIA). OPEC estimates its current production at 33.2 million bpd and is offering to curb output to 32.5 million bpd to 33 million bpd. Should the low quota of 32.5 million bpd be held, the oversupply could be almost eradicated in 2017. Assuming the

high quota of 33 million bpd is likely to materialise in the near future, DW projects the implied oversupply to fall by just over 0.4 million bpd in 2017. With no OPEC output cut, oil demand is projected to increase by 1.4 million bpd in 2016, and production is forecast to grow by 0.5 million bpd. Consequently, the implied oversupply is anticipated to fall by 0.9 million bpd in 2017.

However, given the number of onshore brownfield expansions in Iraq and Saudi Arabia, sanctioned in the boom years and expected to come onstream in 2017, the supply gap is likely to increase. This means that if OPEC is to commit to any production cuts, the actual reduction in output could be greater than a marginal 0.7 million bpd and will likely come from marginal members.

EIA data suggests that the oil price may have bottomed out in January 2016, reaching its lowest



point at US\$26.01 bpd on 20 January. Since then, the oil price has stabilised at above US\$40/bbl, whilst experiencing short-lived increases to around the US\$50 mark. This is due to a combination of factors, including supply outages, following the worsening of the security situation in the Niger Delta, outages in Canada due to wildfires, and OPEC discussions of a potential output curb. Nevertheless, 2016 remained a year with prices hovering at around the US\$50 mark, and market recovery is also likely to remain slow-paced for the rest of the decade.

Key oversupply drivers

A combination of onshore and offshore projects in the Middle East and Eastern Europe will be driving production gains in 2017. The most significant supply additions, amounting to almost 250 000 bpd, are expected from the Kashagan development off Kazakhstan. The widening of the supply gap is likely to be compounded by onshore brownfield work at Lukoil's West Qurna field and BP's Rumalia development in Iraq, coupled with ADNOC's Upper Zakum field off the United Arab Emirates. These three expansions are projected to add a further 350 000 bpd to oil supply in 2017. Although to a lesser extent, 2018 is expected to be another year of production gains, assuming the unconfirmed OPEC cut does not materialise. Supplementary brownfield development work is expected to take place at the Halfaya and Badra fields in Iraq, and the South Azadegan and Yadraharan fields in Iran, accounting for 300 000 bpd of additional crude in 2018, compared to 2017 (or a 542 000 bpd total increase from 2016). Execution of these expansions is unlikely to be deferred, given that these developments currently account for the majority of most output in the region.

Long-term outlook

Whilst the near-term is defined by persistent oversupply, a changing energy mix in the long-term is projected to result in increased consumption of natural gas. DW anticipates strong natural gas resources to drive production growth from 65.4 million bpd in 2016 to 70 million bpd in 2018, whilst continuing to follow an upward trend through to the beginning of the coming decade. This is in line with BP's outlook, according to which, gas' share of global energy consumption is forecast to increase from 24% to 26% over 2015 - 2035. This increase is likely to be primarily driven by economic and population growth in emerging markets, such as China. DW expects oil production to grow at a relatively slow rate compared to gas – from 89 million bpd in 2016 to 92 million bpd in 2018. According to BP

data, oil will see its share of the energy mix decrease from 33% in 2015 to 30% in 2035.

Key growth opportunities lay in the offshore wind and North Sea decommissioning sectors, both in the near-term and the long-term. Cumulative wind capacity is projected to reach nearly 66 GW by 2025, with 1.2 GW of capacity projected to be installed in 2016. Growth in expected capacity additions is anticipated to continue through to 2025, peaking at 11 GW. The UK is forecast to account for the largest proportion of capacity additions between 2016 and 2025 – nearly 16 GW, followed by China, with 11 GW. Successful transferability of skills and assets is possible, given the existing synergies between offshore oil and gas and offshore renewables. This is likely to benefit heavy lift vessels providers and engineering businesses.

Similarly, growing from 2015, North Sea decommissioning expenditure is expected to be on an upward trend from 2017. This is due to the severe impact the oil price downturn has had on the economic viability of many North Sea fields. Decommissioning-related expenditure is projected at just over US\$1 billion in 2017 and is expected to remain above this level through to 2040, peaking at US\$6.6 billion in 2032. The use of single lift vessels on large-scale projects appears to be a more attractive option to the conventional alternative i.e. heavy lift vessels. This can be explained by the more efficient preparation times and relatively lower removal costs that single lift vessels can offer. A notable example is Allseas' single lift vessel *Pioneering Spirit*, which performed its first contract – the removal of the Yme platform – in August 2016. Successful adoption of single lift vessels in the long-term will depend on successful removal of the Brent platform, though competitive day rates and operators' willingness to embrace a move towards more innovative solutions are also important factors.

Commerciality of oil and gas

The Upstream Investment Outlook also presents outputs from its sister report Upstream Capital Projects Study. This new study presents onshore and offshore project economics, including unconventional projects, highlighting major evolutions in Capex per barrel cost. The drop in US shale cost per barrel is largely attributable to a move away from marginal (stripper) wells and a greater focus on productive (core) acreage. Similarly, cost-cutting measures have been a major contributing factor to a lower average cost per barrel for deepwater projects. A combination of project re-engineering and concept re-design are also important influential factors. A continuous focus on fit-for-purpose engineering, and greater operational efficiency,

will be crucial for achieving any sustained reductions in costs per barrel and more favourable project economics for operators in the near to long-term. However, further efficiency in cost-structures can be achieved, and this should remain the key focus among service providers in the supply-chain, in order to reduce impacts of future cycles.

Uncertainties

Political tensions, corruption scandals, changes in regulation, and the outcome of the recent referendum in the UK, are among many external factors contributing to industry-wide uncertainty. Whilst these events are unlikely to have a direct impact on the shape of industry recovery, they

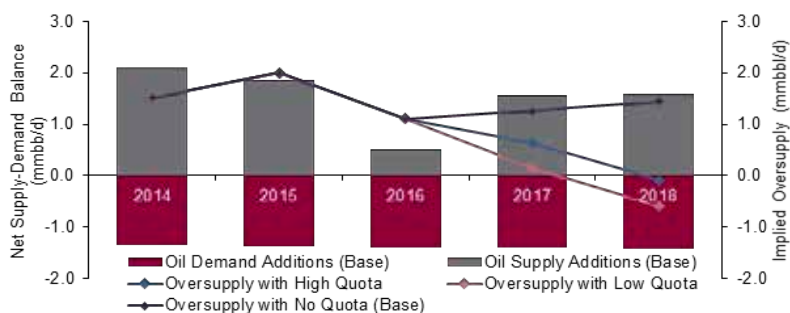


Figure 1. Oil Supply-Demand Balance, 2014 - 2018. Source: Douglas-Westwood Drilling and Production Market Forecast.

can create additional market instability and a change in investor expectations and consumer confidence. 2016 was an eventful year, which witnessed some unexpected supply disturbances, following attacks on pipeline infrastructure in Nigeria and wildfires in Canada, causing a marginal rebound in oil prices. Significant price recovery, however, failed to take place. The outcome of the recent referendum in the UK, arguably another unanticipated event, has not had a detrimental impact on the oil and gas industry in the short-term. Nevertheless, whilst an exit strategy with the EU is being planned, wider economic uncertainty remains a primary risk to investor confidence and consumption growth. In the last decades, the UK has witnessed important changes to its dependence on imported fossil fuels. 2013 saw the UK become a net importer of petroleum products, relying on imports from its EU partners, including France and the Netherlands. Since the vote to leave the EU, the sterling has depreciated on several occasions, hitting a 31 year low at US\$1.26 against the dollar in early October 2016. This has led to higher import costs and more uncertainty over future energy supply. The market is likely to remain unstable, whilst investors and consumers are re-setting their expectations, given that details on UK's exit deal remain unknown.

Conclusion

As shown in the findings of the Upstream Investment Outlook, the industry will continue to face suppressed oil prices, reduced upstream Capex, and persistent oversupply – assuming no OPEC cut – in the near-term. The potential OPEC production curtailment presents two main case scenarios. The market could either witness a fall in oversupply to ~0.6 million bpd in 2017, with a high quota, or the oversupply could be almost eliminated, should

the low quota be applied. Provided no OPEC cut takes place, the implied oversupply is projected to fall by 0.9 million bpd in 2017. This will be driven by key onshore and offshore brownfield expansions, which are unlikely to be postponed, given that they are nearing completion.

Whilst oversupply is likely to persist in the near-term, a change in the energy mix is forecast to drive industry activity in the long-term. Robust natural gas production and abundant resources will contribute to a stronger competitive position of natural gas in the energy mix compared to oil. Offshore wind and North Sea decommissioning are two bright-spots, providing promising growth opportunities extending into the next decade. Supply-chain players with less reliance on oil and gas assets are likely to be better placed to seize successful diversification opportunities between sub-sectors.

A greater operational efficiency has been noticed in the industry through project re-engineering and concept re-design. These evolutions represent an improvement in industry behaviour and practices and are likely to continue contributing to lower project development costs in the near future.

Despite near-term market suppression, opportunities should not be ignored, even in times of uncertainty. A potential OPEC production cut in the near-future is likely to result in some oil price recovery and elimination of the supply gap. This, in turn, is likely to result in positive revisions to production and investment targets, resulting in improved economic viability of offshore projects. This could be the beginning of a long-awaited market recovery.

Note

*Please note that all information within this article was accurate at the time of writing. ■



k-Drill®: your reliable source for every demand with top-grade KCl.

Specifically designed for the challenging demands of the drilling industry k-Drill is a high performance product range of best quality potassium chloride. It is primarily used to prepare brines for drill-in, completion and work over fluids. k-Drill products combine German quality with reliable global service. No thrill, just drill. Whenever you need us, we are there.



THAT WAS A SAMPLE OF

OILFIELD TECHNOLOGY

EXPLORATION | DRILLING | PRODUCTION

DECEMBER ISSUE



DON'T WANT TO MISS OUT?

You will need to register to read the full edition.

Please log in to www.oilfieldtechnology.com

or alternatively click **here** to register for **free!**

For more information about
Oilfield Technology subscription package, please contact us:

E: subscriptions@oilfieldtechnology.com

T: +44 (0)1252 718999