

# Oil Review

## Middle East

Covering Oil, Gas and Hydrocarbon Processing

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Covering Oil, Gas and Hydrocarbon Processing

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**Editor:** Louise Waters - ✉ [louise.waters@alaincharles.com](mailto:louise.waters@alaincharles.com)

**Editorial and Design team:** Bob Adams, Prashanth AP, Hiriya Bairu, Sindhuja Balaji, Andrew Croft, Thomas Davies, Ranganath GS, Rhonita Patnaik, Debanti Roy, Prasad Shankarappa, Zsa Tebbit, Lee Telot and Ben Watts

**Publisher:** Nick Fordham

**Publishing Director:** Pallavi Pandey

**Magazine Sales Manager:** Camilla Capece  
☎ +971 4 448 9260 📠 +971 4 448 9261  
✉ [camilla.capece@alaincharles.com](mailto:camilla.capece@alaincharles.com)

#### International Representatives

**China** **Ying Mathieson**  
☎ (86) 10 8472 1899 📠 (86) 10 8472 1900  
✉ [ying.mathieson@alaincharles.com](mailto:ying.mathieson@alaincharles.com)

**India** **Tanmay Mishra**  
☎ (91) 80 65684483 📠 (91) 80 40600791  
✉ [tanmay.mishra@alaincharles.com](mailto:tanmay.mishra@alaincharles.com)

**Nigeria** **Bola Olowo**  
☎ (234) 8034349299  
✉ [bola.olowo@alaincharles.com](mailto:bola.olowo@alaincharles.com)

**UK** **Steve Thomas**  
☎ (44) 20 7834 7676 📠 (44) 20 79730076  
✉ [stephen.thomas@alaincharles.com](mailto:stephen.thomas@alaincharles.com)

**USA** **Michael Tomashefsky**  
☎ (1) 203 226 2882 📠 (1) 203 226 7447  
✉ [michael.tomashefsky@alaincharles.com](mailto:michael.tomashefsky@alaincharles.com)

#### Head Office:

Alain Charles Publishing Ltd  
University House, 11-13 Lower Grosvenor Place, London  
SW1W 0EX, United Kingdom  
☎ +44 (0) 20 7834 7676 📠 +44 (0) 20 7973 0076

**Middle East Regional Office:**  
Alain Charles Middle East FZ-LLC  
Office 215, Loft 2A, P.O. Box 502207, Dubai Media City, UAE  
☎ +971 4 448 9260, 📠 +971 4 448 9261

**Production:** Nikitha Jain, Nathanielle Kumar  
Donatella Moranelli, Rachel Neeson and Sophia White -  
✉ [production@alaincharles.com](mailto:production@alaincharles.com)

**Subscriptions:** ✉ [circulation@alaincharles.com](mailto:circulation@alaincharles.com)

**Chairman:** Derek Fordham

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## → Editor's note

IT WAS ENCOURAGING to see a good turnout at MEOS in early March. There were large delegations from Saudi Aramco and other NOCs, with an official delegation from Egypt present for the first time. Perhaps the silver lining in the current low oil price scenario is the region's increasing openness to innovative solutions, which could help to reduce costs; niche technology companies reported much interest in their products. As one commented, "Now is the age of science." One highlight of this year's MEOS was the well-attended opening ministerial session where the oil ministers of Bahrain, Kuwait and the UAE, along with the secretary general of OPEC, spoke frankly about the challenges and issues facing the region and future plans. See our next issue for a full report. Finally, don't forget our Big Data Analytics for Oil & Gas conference in April; we hope to see you there.

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## BP forecasts domestic demand to grow faster than production

THE MIDDLE EAST will maintain its leading role as the world's top oil exporter, but its share of production exported will decline as domestic use rises, according to BP's new edition of its *Energy Outlook 2035*. Middle East energy production is expected to rise 32 per cent by 2035. However, consumption grows by 69 per cent, with 97 per cent of demand still met by fossil fuels by the end of the outlook period.

Middle East oil production is expected to increase by 19 per cent, but demand is set to rise by 48 per cent by 2035, reducing the share of production exported. The Middle East remains the world's largest oil-producing region; its share of global supply falls from 32 per cent to 28 per cent over the next few years, but returns to 32 per cent by 2035, says the report.

The region also remains the world's largest oil exporter, with volumes rising from 20mn bpd currently to 21mn bpd in 2035. It continues to make up roughly half of all inter-regional exports. The share of production exported, however, declines from 70 per cent to 63 per cent by 2035 as regional demand grows faster than supply.

Natural gas is the fastest-growing fossil fuel in terms of both production (+63 per cent) and consumption (+87 per cent). Consequently, gas's share of primary energy demand expands from the current 49 per cent to 54 per cent in 2035.

By sector, industry consumes the most energy, with 43 per cent market share in 2035, and it is also the fastest-growing sector (+72 per cent). Energy used for power generation grows by 77 per cent, increasingly dominated by gas. Transport demand increases 66 per cent by 2035.

The Middle East surpasses the former Soviet Union as the most energy-intensive region in the world. It remains the most oil-intensive region and becomes the most gas-intensive region.

The region is expected to become the largest consumer of liquid fuels (oil, biofuels and other liquids) per capita, surpassing North America. By 2035, its liquids consumption per person is over three times the global average.

It is projected that the region's population will expand 37 per cent by 2035 and that GDP grows by 88 per cent.

## Middle East to remain 'cornerstone' of global oil market

THE MIDDLE EAST will continue to play a vital role in the global oil market, particularly from around 2020, as production from other oil producing regions slows, said Fatih Birol, chief economist at the International Energy Agency (IEA), making a keynote speech at the Telegraph Media Group's *Middle East Congress* in London on 26 February.

“The Middle East is and will remain a cornerstone of the global oil market for many years to come”

Although it may have the capacity to increase production, the USA “will never be a major exporter” due to its large domestic demand, commented Birol, who is due to succeed Maria van der Hoeven as the agency's executive director later this year. “The Middle East is and will remain a cornerstone of the global oil market for many years to come,” he maintained.

With global oil demand forecast to grow to 104mn bpd by 2020 from the current level of around 90mn bpd, the Middle East will be called upon to plug the gap, he said – and much of that production growth will need to come from Iraq, whose huge reserves can be developed at a relatively low cost. However, with the geopolitical turmoil casting uncertainty over the ability of the region to attract the requisite upstream investment, Birol foresaw energy security moving up the international policy agenda.

The IEA's chief economist also underlined the increasingly significant role played by the Middle East as an oil consumer and second largest driver of oil demand growth



Fatih Birol,  
chief economist, IEA

after China. He remarked that this is a result not only of growing populations and developing economies, but also of huge subsidies, noting that the region accounted for almost half of the US\$550bn global fossil fuel subsidies in 2013.

Birol predicted that the oil market would rebalance itself within the next few months,

as investment cutbacks in high-cost areas such as North America and Brazil curtail production, while low prices boost demand. He noted the overall negative impact of the low oil price on MENA economies, forecasting a drop in the region's oil revenues to around US\$400bn in 2015 from almost US\$800bn in 2014.



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## → Executives' Calendar 2015

MARCH 2015			
22-26	<b>SOGAT</b>	ABU DHABI	www.sogat.org
25-27	<b>OMC</b>	RAVENNA	www.omc2015.it
APRIL 2015			
13-14	<b>Tank World Expo</b>	DUBAI	www.tankstorageforum.com
14-15	<b>WEPower</b>	DAMMAM	www.wepower-sa.com
19-21	<b>Big Data Analytics for Oil &amp; Gas</b>	ABU DHABI	www.oilandgasbigdata.com
21-23	<b>Arab Oil &amp; Gas</b>	DUBAI	www.ogsonline.com
22-25	<b>Erbil Oil &amp; Gas</b>	ERBIL	www.erbiloilgas.com
MAY 2015			
17-19	<b>Managing Talent in Oil &amp; Gas</b>	ABU DHABI	www.managing-talent.net
19-21	<b>CCPS-MEPSC</b>	ABU DHABI	www.mepsc.org
19-21	<b>EPC Contracts in Oil &amp; Gas</b>	DUBAI	www.cwcschool.com
26-27	<b>ISA Automation Conference &amp; Exhibition</b>	ABU DHABI	www.isa-emea-expo.org
26-28	<b>WPC Leadership Conference</b>	TROMSØ	www.wpcleadership.com
JUNE 2015			
1-3	<b>IRPC</b>	ABU DHABI	www.cvent.com
1-5	<b>World Gas Conference</b>	PARIS	www.wgc2015.org
2-5	<b>Caspian Oil &amp; Gas Exhibition</b>	BAKU	www.caspianoilgas.az
8-10	<b>Iraq Petroleum 2015</b>	LONDON	www.cwciraqpetroleum.com
23-24	<b>FLNG World Congress</b>	SINGAPORE	www.flngworldcongress.com
SEPTEMBER 2015			
8-11	<b>Offshore Europe</b>	ABERDEEN	www.offshore-europe.co.uk
15-17	<b>MEPEC</b>	MANAMA	www.mepec.org

*Readers should verify dates and location with sponsoring organisations as this information is sometimes subject to change.*

## SABIC demonstrates a host of new products at Saudi printing and packaging expo

SABIC UNVEILED ITS latest products in the construction, printing and packaging markets at the 12th Saudi Exhibition for Printing, Packaging, Plastics and Petrochemicals (Saudi PPPP), which was held at Jeddah Centre for Forums and Events from 1-3 March 2015.

The firm was the Diamond Sponsor for the exhibition, where a number of companies from the transportation, health and consumer appliances sectors showcased their products. SABIC's polymers, synthetic rubber and specialty ranges were also on display, which the company said would meet the sustainability needs of its customers in the Saudi Arabian market.

SABIC held a series of lectures to increase awareness among customers on a host of different subjects, including research, technology, manufacturing and marketing, as well as business developments specific to the company's operations.

Mosaed Al-Ohali, SABIC executive vice-president – polymers, stated that SABIC's participation showed its continuing efforts to create new, innovative solutions in order to achieve sustainable development. SABIC also used its platform at the event to demonstrate its latest technologies,



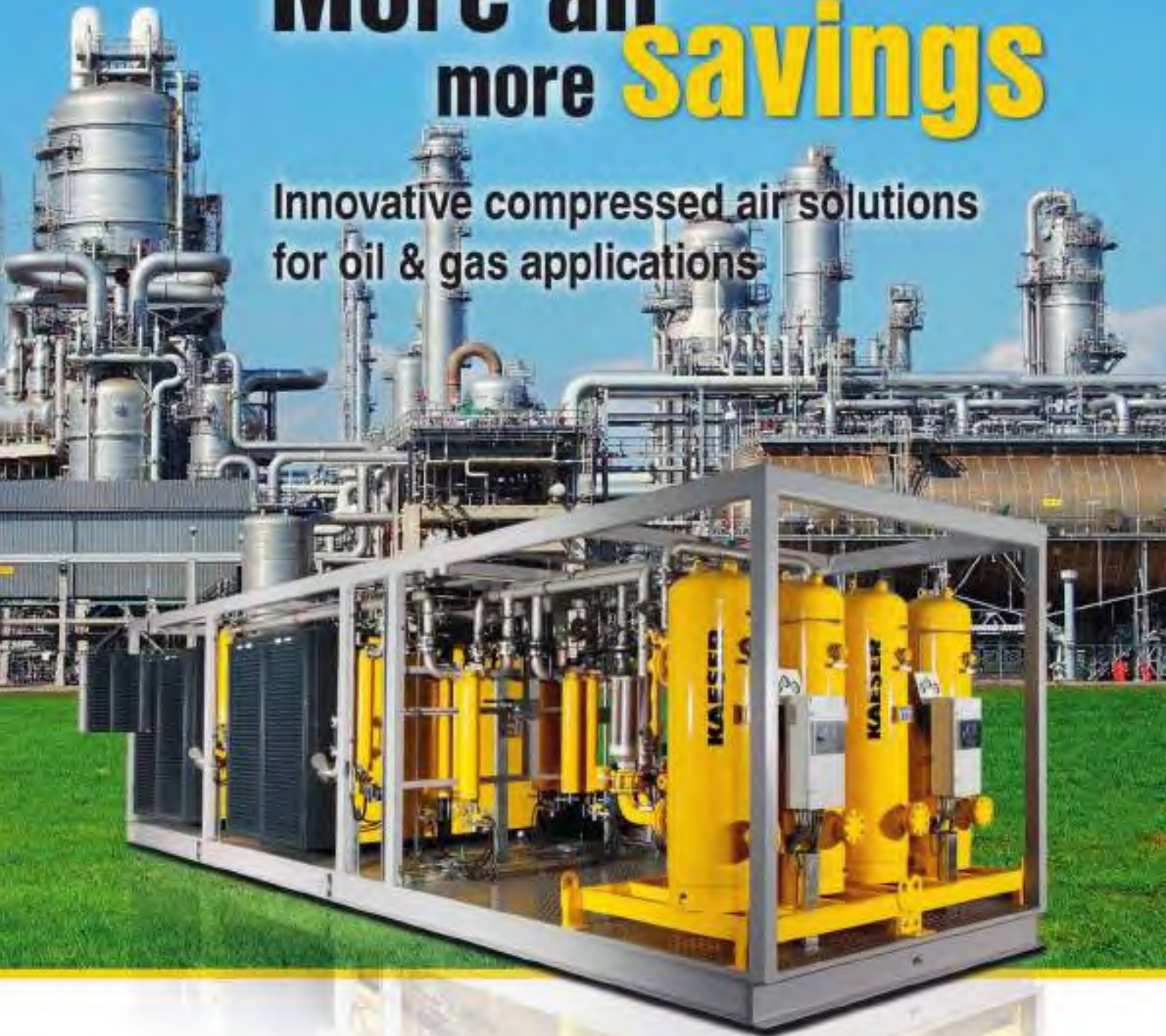
*SABIC showcased the latest technologies, applications, systems and products for its customers in the Saudi Arabian market*

applications, systems and products, providing its customers with the opportunity to find out more about the products and the support the company can offer them in enhancing their manufacturing capabilities, in line with Saudi Arabia's development plans, Al-Ohali added.

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## Dubai hosts storage event with a global perspective

THE THIRD ANNUAL Tank World Expo will be held at the Dubai World Trade Centre on 13-14 April 2015 in what is set to be the region's biggest ever storage event.

Global energy markets continue to evolve and demand for storage across the region is growing. Now in its third year, the organisers are looking to deliver an event for executive industry leaders to share best practice and view blueprints for development in the region.

The event has grown rapidly since its inception in 2013, with visitor numbers increasing by 640 per cent between the first and second editions, according to its organisers. This year's event promises to be even bigger than the 2014 show, with organisers stating that there will be 120 per cent growth in exhibitor numbers. Attendees will be able to enjoy two days of expert insight, practical case studies, in-depth discussion, technology launches and networking. The show has a global perspective, assembling expert speakers representing not just facilities, terminals and ports in the UAE, but also in Saudi Arabia, Oman, Egypt, Jordan, Turkey, the Netherlands, Iraq, Nigeria, Spain and India.

Tank World 2015 will provide a unique platform for more than 80 speakers and 100-plus technology and solutions providers who will be exhibiting at the event. In addition to support from the UAE Ministry of Energy, the event is sponsored by industry leaders Emerson, Endress+Hauser and Colfax, with support from Knowledge Partners, Ernst & Young, Ratio Group, Fujairah Free Zone, Horizon Terminals, ENOC, Socar Aurora, GPS Chemoil, Gulf Petrochem, Saudi Aramco, ABBCO, ADPC, DP World, Sohar Port, Salalah Port, Port of Tarragona, Stolthaven, Cylingas, PJK International and many more.



Discussions at a previous edition of Tank World Expo

The event will also provide free entry to more than 40 exhibitor seminar presentations and product innovation demonstrations.

Tank World Expo managing director Alex Williamson said, "It's the only event to bring expert speakers, visitors and exhibitors from across the entire tank storage value chain to one location, and, with the Middle East at the heart of the global oil and petrochemical industry, Dubai is the perfect host."

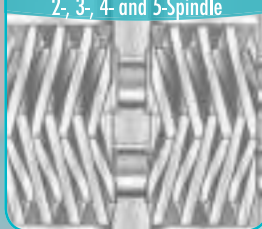
For more on the event, visit: [www.tankworldexpo.com](http://www.tankworldexpo.com)

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## KOC targets production of 3.65mn bpd of oil by 2020

KUWAIT OIL COMPANY (KOC) will produce 3.15mn bpd of oil by 2016, according to the company's CEO, with the figure set to grow to 3.65mn bpd by 2020.

Hashim S Hashim, CEO of KOC, said, "The company's future plan is to develop a number of oilfields in areas across the country with the ultimate goal of producing no less than 3.65mn barrels of oil by 2020, which will represent KOC's contribution to an overall national ambition to produce at least four million bpd by that time."

Kuwait's current oil production ranges from 2.9mn bpd to three million bpd. Several new oil reserves were discovered by KOC in the north and west of Kuwait and are currently being developed for eventual use, added Hashim.

KOC plans to invest US\$40.45bn in energy projects in the country over the next five years, with the company set to also increase the number of its oil and gas rigs by 50 per cent by early 2016, adding a boost to the country's crude and gas production in spite of low oil prices.

In 2013, the number of oil and gas rigs in the country stood at 50, which has since increased to 80 rigs. This number is expected to reach 120 rigs by 2016, Hashim noted.



Hashim S. Hashim, CEO of KOC (Photo: KOC)

## SNC-Lavalin wins two Middle East contracts worth a combined value of US\$500mn

SNC-LAVALIN HAS announced that Kentz Corporation, a member of the SNC-Lavalin Group, has been awarded two sustaining capital contracts by a major oil company in the Middle East, with an anticipated combined value of more than US\$500mn.

While the client has yet to be named, the awards were included in the group's backlog figure announced to the market in early March 2015.

Kentz was acquired by SNC-Lavalin in August 2014, leading to an increase in the capabilities of SNC-Lavalin in the oil and gas services sector, with a workforce of approximately 20,000 employees. Since the acquisition, SNC-Lavalin and Kentz have combined their capabilities to offer further services to its customers throughout the Middle East.

Neil Bruce, president – resources, environment and water for SNC-Lavalin Group, said, "Both Kentz and SNC-Lavalin have excellent longstanding relationships with this client in the Middle East and we are pleased to have the opportunity to strengthen those links further by delivering on this important project."

Bruce congratulated the group's teams throughout the Middle East, hailing their "dedication and hard work" with more than US\$1bn in new contracts signed in the region since Kentz joined SNC-Lavalin Group.

Engineering and construction group SNC-Lavalin was founded back in 1911 and currently has offices in more than 50 countries worldwide.

## ADNOC and Occidental signs oilfield evaluation contract

ABU DHABI NATIONAL Oil Company (ADNOC) has signed a technical agreement with US-based Occidental Petroleum to develop the al-Hail and Ghasha oilfields located offshore Abu Dhabi.

The agreement was signed by Mohammed Butti Al Qubaisi, director of exploration and production at ADNOC and Edward Lowe, president of Occidental Oil and Gas International.

According to ADNOC, Occidental Petroleum will cooperate on the programme and will spend US\$500mn to run 3D seismic surveys, drilling appraisal wells and engineering studies to evaluate development prospects of the fields by 2017.

Saoud Mubarak AlMehairbi, manager of the exploration division at ADNOC, noted that the technical evaluation agreement would help to further promote mutual cooperation between the two companies.

"Under this agreement Occidental Petroleum will also organise a number of training courses to

provide human resources development opportunities to ADNOC staff focusing on selected areas such as geology and technical areas," added AlMehairbi.

ADNOC holds a 70 per cent share in the oilfields development venture in Abu Dhabi, while Occidental Petroleum holds the remaining share.



Occidental Petroleum will develop the al-Hail and Ghasha oilfields offshore Abu Dhabi (Photo: Guilhem Vellut)

## BP makes second 'significant gas discovery' offshore Egypt

BP EGYPT HAS announced its second important gas discovery in the North Damietta Offshore Concession in the East Nile Delta.

The Atoll-1 deepwater exploration well, currently being drilled using the sixth-generation semi-submersible rig Maersk Discoverer, reached a depth of 6,400 metres, penetrating approximately 50 metres of gas pay in high-quality Oligocene sandstones. Expected to be the deepest well ever drilled in Egypt, the well still has another one kilometre to drill to test the same reservoir section found to be gas bearing in BP's significant 2013 Salamat discovery, 15 km to the south.

BP Group chief executive Bob Dudley said, "Success in Atoll further increases our



BP Group chief executive Bob Dudley

estimated potential in the concession exceeds five trillion cubic feet and we now have a positive starting point for the next possible major project in Egypt after BP's West Nile Delta project."

BP North Africa regional president

confidence in the quality of the Nile Delta as a world-class gas basin. This is the second significant discovery in the licence after Salamat. The

Hesham Mekawi remarked, "The Atoll discovery is a great outcome for our second well in this core exploration programme in the East Nile Delta. It demonstrates BP's continuous efforts to help meet Egypt's energy demands through the exploration of potential in offshore Nile Delta.

"We are proud of our commitment to unlock Egypt's exploration potential that requires large investments to utilise using the latest drilling and seismic technologies," Mekawi added.

Atoll-1 was drilled in 923 metres water depth, in a location 80 km north of Damietta city, 15 km north of Salamat and only 45 km to the north west of Tamsah offshore facilities. BP has 100 per cent equity in the discovery.



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## Omani oilfield averaged 122,000 boepd in 2014

GROSS PRODUCTION FROM the Mukhaizna heavy oilfield (Block 53) in Oman averaged 122,000 boepd in 2014, operator Occidental has announced.

Occidental, a wholly-owned subsidiary of Occidental Petroleum Corporation (OXY), is the largest independent producer of hydrocarbons in the sultanate with interests in four of the country's oil and gas blocks. The Mukhaizna field accounts for much of its black oil output.

Occidental said that it had drilled more than 2,400 new wells by the end of 2014, while pressing ahead with the installation of a major steamflood project targeting Mukhaizna's heavy oil reservoir.

Gross daily production from the field averaged around 122,000 boepd, which was 15 times higher than the production rate in September 2005 when the company took over operation of the field under a production sharing agreement with the Omani government. Occidental's share of production from Oman was approximately 76,000 boepd in 2014, the company added.

Mukhaizna, located 500 km southwest of Muscat, is estimated to have 2.4bn barrels of 16° to 18° gravity, highly viscous oil in place in Lower Permian Upper and Middle Gharif unconsolidated sandstones at 900 metres. It is the sixth largest field discovered in Oman. It also hosts one of the world's largest thermal enhanced oil recovery (EOR) projects. At the core of the project is an oil treatment plant with a capacity of more than 180,000 bpd and steam injection facilities of a capacity greater than 600,000 barrels of steam per day (bspd).



**The Mukhaizna heavy oilfield is located 500 km southwest of Muscat (Photo: Peter Dowley)**

In addition to its role as the operator of the Mukhaizna field, Occidental has a 45 per cent working interest in the block. The firm is also the operator of Block 9 and Block 27, with a 65 per cent working interest in each block. The latter blocks contain the Safah and Wadi Latham fields.

In 2008, Occidental was awarded a 20-year exploration and production sharing agreement for Block 62 – also known as the Habiba Block – in north Oman, with a 48 per cent working interest. The company has been pursuing development and exploration opportunities targeting gas and condensate resources within the 2,200 sq km concession.

Last year, it announced the signing of a five-year extension to the initial phase for the discovered non-associated gas area for Block 62.

Sixteenth Investment Company LLC (an affiliate of Mubadala Petroleum in Abu Dhabi) has a 32 per cent interest in the block with Oman Oil Company holding the remaining 20 per cent.

## Saudi Arabian oil output set to rise to 10mn bpd

OIL PRODUCTION IN Saudi Arabia is rising, with output currently standing at around 10mn barrels per day (bpd), according to energy consultancy firm PIRA.

Saudi Arabian production has averaged close to 9.7mn bpd since June 2014, but "additional demand has pushed output to just under, if not above, 10mn bpd," the consultancy said a recent weekly note.

The estimated increase suggested that the country has been following closely its strategy of protecting its market share over cutting production in order to inflate prices.

A survey carried out by Reuters earlier in the year indicated that the kingdom's production levels, which have been flat to slightly higher according to sources, boosted OPEC's overall oil supply for January.

The figures have been seen as a sign that key members of the organisation have been standing firm in refusing to prop up oil prices, which fell by 60 per cent between June 2014 and January 2015, and have remained low as oversupply outweighed concerns about supply disruptions.

The information from PIRA and Reuters contrasted with data released in February by the Joint Organisations Data Initiative, which revealed that Saudi Arabian production was held at close to 9.6mn bpd in December 2014.



**Oil production in Saudi Arabia has averaged 9.7mn bpd since June 2014 (Photo: ujahabdul)**

## Algeria to drill first offshore oil well by end of 2015

ALGERIA'S STATE-OWNED energy firm Sonatrach will drill its first offshore oil well by the end of 2015, with annual refining output hitting 87.7mn cu/m at the end of last year, energy minister Youcef Yousfi has announced.

The refining output was 70.7mn cu/m when the country first launched improvement work at its main refineries in 2012.

"With that work over, output rose by 17mn cu/m in 2014," Yousfi added.

Yousfi said that five new refineries would also be built to double capacity by 2020.

Algeria exports several refined oil products, but also imports petrol and diesel due to growing domestic demand.

"We are still developing our capacity to meet our citizens' needs," Yousfi remarked.

Zoubida Benmoufouk, head of refining at Sonatrach, revealed that both diesel and petrol output would double to 25.4mn cu/m and 22.6mn cu/m respectively in 2018.

According to press reports, Algeria has been seeking to boost energy output to improve earnings from exports on which the government heavily relies to implement social programmes and fund economic development plans.

"We have finished seismic studies," the energy minister noted, adding that new onshore oil and gas fields would also start production in the next few years.

Sonatrach revealed that it would open a new round of bidding for investment in Q3 2015. During the last round of bidding in September 2014, only four out of 31 blocks on offer were awarded.



**Algerian energy minister Youcef Yousfi said the well would be drilled by the end of 2015 (Photo: Robert Seale)**

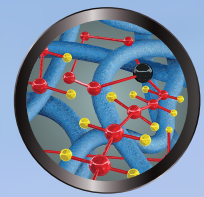
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# MENA gas: The need to expand production

There is an urgent need to tackle the MENA region's chronic gas supply deficit, says economist Moin Siddiqui.

**T**HE MIDDLE EAST and North Africa (MENA) region is pivotal to the global natural gas market because of the large size of its proven gas reserves, which (at the end of 2013) totalled 3,140 trillion cubic feet (tcf), representing 48 per cent of the world's proved reserves of 6,558 tcf. However, despite colossal resources, every country, with the exception of Qatar and Algeria, is short of gas supply to meet current and projected demand. There is a clear need to expand the region's production capacity.

The demand for natural gas in 16 MENA countries grew from 282bn cubic metres (bcm) in 2003 to 512 bcm in 2013, a growth rate of 8.1 per cent per annum, substantially higher than that of world gas demand, which was 2.9 per cent for the same period. MENA consumption in 2013 accounted for around 15.3 per cent of global gas use. The top five natural gas markets are Iran, Saudi Arabia, UAE, Egypt and Algeria, representing over four-fifths of total regional consumption in 2013, according to the BP database.

The rapid growth of gas consumption in recent decades is driven by a host of factors, including demographic and economic growth underpinned by generous fuel subsidies; the expansion of energy-intensive industries such as aluminum, steel, petrochemicals, and fertilisers that consume gas as cheap feedstock – Bahrain has the world's largest aluminum smelter

(ALBA); and the policy of displacing liquid fuels with natural gas for electricity and water (desalination) sectors.

Most importantly, gas prices for domestic users in most MENA countries are well below the cost of supply, thus encouraging excessive but inefficient use of gas by residential and industrial sectors. Highly subsidised electricity supply has led to high per capita electricity consumption across the region compared to the global average. Such low prices, however, erode the viability of state-owned utilities that buy natural gas from the producers, one of the effects of which is perennial late payments for supply. That, in turn, discourages producers from raising production for local consumption and creates an export bias.

“MENA consumption in 2013 accounted for around 15.3 per cent of global gas use”

The marketed gas production of MENA countries in 2013 (excluding gas flared or reinjected for enhanced oil recovery) amounted to 715 bcm, or one fifth of world production. The top five producers are Iran, Qatar, Saudi Arabia, Algeria, and Egypt and UAE (joint fifth place).

**Table 1: Natural Gas Production & Consumption, MENA Region**

Country	2012		Import	Export	Net Trade	Proved Reserves Tcf 2013	R/P* ratio years
	Output	Usage					
Algeria	7,489	4,275	0	1,730	1,730	159.1	573
Bahrain	481	481	0	0	0	6.7	12.1
Egypt	2,141	1,882	0	259	259	77.2	33.0
Iran	5,649	5,511	188	326	138	1,193	100+
Iraq	23	23	0	0	0	126.7	100+
ordan	8	25	17	0	-17	0.213	20.6
Kuwait	548	642	94	0	-94	63.5	100+
Libya	430	202	0	228	228	55.0	100+
Morocco	2	38	36	0	-36	0.051	38.5
Oman	1,035	715	65	384	319	33.5	30.7
Qatar	5,523	1,257	0	4,267	4,267	890.0	200.0
Saudi Arabia	3,637	3,637	0	0	0	291.0	80.0
Syria	228	228	0	0	0	10.1	64.0
Tunisia	66	130	64	0	-64	2.3	30.0
UAE	1,854	2,235	662	281	-381	215.1	100+
Yemen	270	34	0	236	236	17.0	46.3
<b>TOTAL</b>	<b>29,384</b>	<b>21,315</b>	<b>1,126</b>	<b>7,711</b>	<b>6,585</b>	<b>3,140.4</b>	<b>100+</b>

\*Reserves-to-production ratio - If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

Sources: Cedigaz; BP Statistical Review of World Energy June 2014; US Energy Information Administration (EIA).



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However, the region's provable reserves are adequate to sustain production at current annual rates for 113 years, compared with the worldwide reserves-to-production ratio (RPR) of 55 years.

Of the 16 countries, seven were net exporters in 2012 (Iran, Oman, Qatar, Yemen, Algeria, Egypt and Libya), four had neither imports nor exports (Bahrain, Iraq, Saudi Arabia and Syria), and the remaining five were net importers (the UAE, Kuwait, Jordan, Tunisia and Morocco). Of these five, the UAE alone had both exports and imports, the latter exceeding the former, reflecting a booming economy, while the other four had no exports at all.

### Bottlenecks

The availability of gas is a critical issue across the region as governments acknowledge that current domestic production is insufficient to cope with ballooning needs, especially of their power sectors. This prompted a search for alternative energy (particularly renewables), as well as sources of imported piped gas through onshore or offshore pipelines and liquefied natural gas (LNG). The potential for intra-regional gas trade is substantial, given the level of export surpluses of a few countries (notably Qatar and Algeria).

With advances in gas turbine and combined-cycle technologies, the use of natural gas in electricity has improved power generation efficiency (i.e. less gas is wasted, with more power being generated from less fuel), while reducing overall power generation costs, compared with oil-fired plants using conventional steam turbines and diesel-generating sets. Thus switching from oil to gas for power generation has become widespread across the region in recent years. The shift has also been spurred by environmental factors, as gas-fired facilities are less polluting and produce less greenhouse gas per kilowatt-hour (KWh) generated.

Yet the biggest obstacle to developing new power generating capacity is the supply of fossil fuels. Traditionally, the region relied on heavy oil for electricity generation. This trend was gradually reduced, as natural gas became an attractive substitute due to its economic and environmental attributes. Between 1990 and 2010, the share of gas in power generation doubled from 25 to around 50 per cent. Growing shortages of gas resulting in power outages – mostly outside the Gulf Cooperation Council (GCC) countries – have eroded public support for continued export of gas (notably in Egypt).

Saudi Arabia has the largest expansion programme in the region with plans to boost generating capacity to 120 gigawatts (GW) by 2032 from 58 GW in 2012. The Saudi Electricity Company (SEC) aims to reduce direct crude burn for electricity by more than 500,000 bpd

“Prospects for a higher rate of gas production in the MENA region are contingent on several factors”

by switching to natural gas. In 2012, gas accounted for two thirds of SEC's available generating capacity. Kuwait plans to increase installed capacity to 25 GW by 2020 to meet anticipated peak demand of 22.5 GW and to hold a reserve margin of more than 10 per cent.

Algeria's peak demand is projected to increase to 20 GW by 2017. Sonelgaz (the state utility) has commissioned six combined-cycle gas turbines, which are scheduled to come online later this year. However, Algeria is struggling to increase natural gas output as new projects have repeatedly been delayed. Meanwhile, political instability in Egypt has slowed the government's plans to expand installed generating capacity by 30 GW by 2020.

### Future trends

The *BP Energy Outlook 2030* has projected gas demand growth in the Middle East at four per cent annually, the second-fastest growth after developing Asia, fuelled mainly by power generation, followed by industrial needs. Displacement of oil burning accounted for two-fifths of the surge in regional gas consumption. Export growth in LNG from the Middle East may decline after 2020, as import needs far exceed production growth, according to BP. Imports are forecast to exceed export surpluses by 28 and 88 bcm, respectively, by 2020 and 2030.

The International Energy Agency (IEA) has predicted that, during 2008–35, Middle East gas demand (excluding North Africa) will grow from 335 bcm to 632 bcm at an annual rate of 2.4 per cent, surpassing world demand growth of 1.8 per cent (from 3,149 bcm to 5,132 bcm). While gas production in the Middle East will expand from 343 bcm to 917 bcm, an annual rate of 3.2 per cent, versus growth in global production of 1.8 per cent a year (from 3,167 bcm to 5,132 bcm). The cost of production, which has so far been low, will rise in tandem with future needs to develop technically difficult reserves compared with the costs of existing supply.

Prospects for a higher rate of gas production in the MENA region are contingent on several factors: (i) the need to reinject a large portion of gross gas production for enhanced oil recovery from aging oil wells; (ii) limits to increases in associated gas supply linked to oil production quotas imposed by OPEC; (iii) the near exhaustion of easy

**Table 2: Projected Surpluses & Deficits of Gas in Arab Countries**

Country	Demand		Production		Output	Surplus/Deficit	
	2020	2030	2020	2030	2013	2020	2030
Morocco	5.0	8.0	0.4	0.4		-4.6	-7.6
Algeria	45.0	65.0	115.0	135.0	78.6	70.0	70.0
Tunisia	8.5	10.0	3.3	3.3		-5.2	-6.7
Libya	20.0	40.0	35.0	55.5	12.0	15.0	15.5
Egypt	72.8	97.8	100.0	120.0	56.1	27.2	22.2
Iraq	35.1	61.0	54.8	80.6	0.6	19.7	19.6
Jordan	5.6	8.1	0.3	0.3		-5.3	-7.8
Syria	20.0	39.0	15.0	20.0	4.5	-5.0	-19.0
Lebanon	7.0	10.0	0	0		-7.0	-10.0
Bahrain	29.0	37.0	27.0	30.0	15.8	-2.0	-7.0
Kuwait	38.0	60.0	20.3	51.3	15.6	-17.7	-8.7
Saudi Arabia	130.0	50.0	120.0	125.0	103.0	-10.0	-25.0
Qatar	53.0	85.0	182.0	238.0	158.5	129.0	153.0
UAE	107.5	150.0	65.0	78.0	56.0	-42.5	-72.0
Oman	40.5	65.9	45.0	56.0	30.9	-4.5	-9.9
Yemen	5.0	8.0	8.0	14.0	10.3	3.0	6.0

Source: BP



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and inexpensive onshore reserves, while new discoveries are geologically more complex; (iv) the sophisticated development of sulphur-rich (sour) gas, tight gases located at great depths (offshore) or in shale gas formations, which imposes significantly higher capital costs. Hence, incremental production of those 'untapped' gas deposits could be limited in the medium term, despite the availability of ample resources in most countries.

### Piped gas versus LNG imports

Although estimates of gas demand/supply in the longer term are uncertain at best, Iran, Qatar, Iraq, Algeria, Egypt and Libya are likely to hold surplus gas for exports, while all other countries face gas shortages that need to be met through imports. Of these, Saudi Arabia is an exceptional case – it neither imports nor exports gas. This policy could change, as the country is burning increased volumes of high-priced crude for power generation and for other uses.

Oman and the UAE, relatively smaller LNG exporters with volumes in 2013 of 11.5 and 7.4 bcm, respectively, are planning to reduce exports as long-term supply contracts expire within a few years, unless they can boost their production from more difficult and expensive gas fields. With swelling energy demand (tripling in the past decade), Oman intends to divert its current exported volumes of gas away from foreign markets and toward domestic consumers by 2024.

The importing countries have already constructed facilities for the importation of LNG or are planning to do so. Bahrain plans to finish the construction of a 400mn cubic feet per day (cf) LNG import facility by early 2017. Overall the strategy of most MENA importers seems to favour pipeline imports wherever feasible and LNG imports where necessary. The latter is more costly.



**Qatar has the potential to increase gas production (Photo: Shell)**

Based on findings of the Public-Private Infrastructure Advisory Facility (2011), the average cost of gas transport via an onshore pipeline is about US\$1.20/mn British thermal unit (btu) per 1,000 km for a 48-inch pipeline carrying some 15 bcm a year. Offshore pipelines are around twice as expensive as onshore pipelines. By contrast, total cost of the LNG option is estimated at US\$4.6 to 6.0/mn btu, of which the cost of liquefaction, shipping and regasification falls within the range of US\$3.5-4.0/mn btu; US\$0.5-1.4/mn btu; and US\$0.6/mn btu, respectively.

### Low-priced gas

Unlike in most regions, the MENA gas industry remains largely under government control, and pricing levels are set directly or indirectly by state entities based on sociopolitical considerations. Authorities in most countries accept the need for higher gas prices to encourage greater efficiency of consumption and to fund increased supply via private investment. For attracting international energy companies to develop new reserves of tight gases and shale gases, all of which are more costly than conventional production, appropriate contracts and fiscal incentives, including higher producer prices that provide reasonable returns on capital, are a necessity. Most likely, however, price adjustments will continue to be made gradually.

“ Authorities in most countries accept the need for high gas prices to encourage greater efficiency of consumption and to attract private investment ”

Qatar, Iran, Iraq, Libya, Saudi Arabia and the UAE appear to have significant potential to increase production in the medium to long term, given their reserves and annual production. In the case of Iraq and Libya, their implementation depends on certainty of political institutions and the restoration of internal security, as do all prospective hydrocarbons projects. Four countries - Algeria, Egypt, Kuwait, and Oman – have some potential to expand natural gas supply. With the exception of Kuwait, however, they have relatively low RPRs.

The vast majority of Iran's gas reserves (1,193 tcf) at the giant South Pars field (the world's second largest after Qatar's North Field) are undeveloped – due to financing, technical and contractual issues, as well as Western sanctions. Iran possesses the capacity to become one of the world's leading producers/exporters given its resource base, which according to BP exceeded those of the Russian Federation (1,103.6 tcf) as of end-2013.

To sum up, the high-energy intensity of growth in the MENA region is a consequence of subsidised energy supply. Further, heavily subsidised gas deters international E&P companies from investing. The power sector remains the key driver of demand growth, hence the urgent need for increased natural gas production. ■

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## Gulfsands Petroleum discovers gas in Morocco

GULFSANDS PETROLEUM HAS discovered gas at the Douar Ouled Balkhair 1 gas exploration well (DOB-1), located within the Rharb Centre Permit in northern Morocco.

During testing, gas flowed to surface during the well clean-up flow period at rates in excess of 283,168 standard cu/m per day on a 48/64-inch choke setting. DOB-1 has now been suspended as a future gas production well, the UK-based explorer said.

The DOB-1 well is the third well to be drilled on the Rharb Centre Permit based on the company's interpretation of 3D seismic survey data acquired in the second half of 2013. The first two wells – LTU-1 and DRC-1 – drilled on the same permit, also found gas.

DOB-1 was drilled to a total depth of 1,140 metres and encountered the primary reservoir target interval on prognosis at a depth of around 808 metres measured depth.

Gulfsands Petroleum CEO Mahdi Sajjad said, "We are delighted with the results of the drilling and flow testing operations at well DOB-1. This is the third consecutive successful exploration drilling result that the company has achieved in Morocco utilising the 3D seismic data acquired and processed in 2013-2014. We are continuing with our efforts to commence production from these discoveries and are receiving much appreciated assistance from ONHYM to ensure this is achieved as soon as possible."

According to Gulfsands Petroleum, significantly elevated gas readings obtained while drilling, as well as interpretation of geological samples and wire line logs, indicated the presence of a gas bearing sandstone reservoir section of excellent quality.

Detailed petrophysical evaluation of wireline logs over the primary target yielded an interpretation indicating a 4.2 metres gross sand thickness, with a net sand thickness of 3.7 metres and evaluated average gas saturation of 70 per cent and average porosity of 34 per cent.

The secondary reservoir target interval for the well was encountered at a depth of approximately 1,075 metres measured depth. Significantly elevated gas readings were encountered over the interval 1,075-1,127 metres measured depth.



DOB-1 was drilled to a total depth of 1,140 metres (Photo: Daniel Foster)

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*Progress is Life*

# Facing the headwinds

Samuel Cizuk assesses prospects for the global oil market, with a focus on the challenges being faced by Iraq.

**O**IL PRICES PARTIALLY rebounded in February after sustained falls since last June. Signs of an increase in demand, together with some supply problems, mainly in Libya and Iraq, have helped to lift prices. However, the biggest trigger is more likely to have been news of the fall in the number of rigs employed in US shale production.

The rebound already looks like a recoil, given continuing uneventful demand-side news towards the start of March, and very large build-ups in global inventories. Given oversupply and rising stocks, soft prices could be with us for quite some time, particularly if we are to wait for demand growth to erode inventories and meet supply, as current Saudi action suggests. For Iraq, which plans to grow its exports this year, and is facing budget difficulties, this is a particularly challenging situation.

“ This suggests that the market if anything is likely to remain flat, or even decline further ”

## Focus on market share

OPEC – primarily Saudi Arabia, the UAE and Kuwait – has continued to focus on market share, with no indication by early March that Saudi Arabia, in particular, is willing to reduce its production. This suggests that the market, if anything, is likely to remain flat, or even decline further. Sizeable month-on-month inventory build-ups in the fourth quarter of 2014 look likely to continue throughout the first quarter, and probably the second quarter, of this year. Although US shale rig utilisation has fallen, this has so far been insufficient to reverse the growth trend for US shale oil production this year. Furthermore, as inventories grow larger, they will take time to shrink, unless either US production

*US shale producers tend to react first to low prices in terms of supply*



capacity is reduced significantly, or Saudi Arabia changes its strategy.

A cut by Saudi Arabia and other OPEC countries seems unlikely, however, at least over the spring, as it would involve a change in strategy; the income forfeited by these producers as oil prices slumped would then have been in vain. US supply growth would likely continue and might even revert to last year's growth rate, while any OPEC production cut would need to be repeated to be effective.

It is the US shale oil producers that are likely to be the most flexible in the high cost production category of the oil industry. Given the short life span of each well and the need to drill continuously in order to grow output, or even just to replace mature fields, it is among these producers where the reaction to low prices in terms of supply tends to come first. Ironically, when prices start to climb significantly again, it is also within this segment where growth could be the quickest to return.

Perhaps the likeliest method to move the shale industry away from its limited focus on delivering growth is to force a period of consolidation, ensuring larger corporations – which more naturally place their investment plans within the context of a global market strategy – come to dominate. We could be watching the start of such a trend, but for this to really take off, prices would have to stay low for long enough to push small, often highly indebted companies out of business. This is likely to start happening in the second half of this year, as much of the current price hedging expires.

The US shale boom has been just the first large-scale supply-side challenge to emerge from a prolonged period of high oil prices. Others are beginning to surface, however. For instance, oil production in Iraq has climbed significantly recently, while oil exports out of Iran, should UN sanctions be lifted, will add further to supply pressures.

### Challenges for Iraq

For Iraq, however, to increase its oil exports significantly, it needs to address problems with uneven crude quality, patchy supplies due to poor infrastructure and political uncertainty. Still, a lot is set to happen. Despite significant delays, several mega projects are now moving forward.. Exports have been rising and are likely to continue to do so, albeit at a much slower pace than the government's official targets.

Iraq also has to deal with some uncomfortable economic and oil policy issues. The oil contract model it has chosen remains inflexible and makes projects more expensive to state coffers when oil prices fall, as IOCs are reimbursed by a set fee structure. A failure by the government to keep up its payments to IOCs could relatively quickly start to affect the development pace of oil projects, both in southern Iraq, as well as in the autonomous Iraqi Kurdistan region. Talks about how a deferred payments situation can be avoided have been launched between Baghdad and IOCs and contacts between Kurdistan Regional Government (KRG) authorities and the oil companies tend to be close and regular. Nevertheless, should the view take hold that there might not be a sustained oil price reprieve for producers coming mid-2016, the choices facing Iraq and the KRG alike will be hard. Looking solely to debt financing will from this perspective not serve to ensure that either investors or crude buyers see sustainability in the approach.

According to a Reuters report in early March, Iraq has said that it is reviewing its oil production agreements with international firms. Oil minister Adel Abdel Mehdi said Iraq is negotiating to restore its state share in oil production contracts with international



*Iraq has a number of challenges to address*

“Despite significant delays, several mega projects are now moving forward; exports have been rising and are likely to continue to do so”

companies to 20-25 per cent, after it was reduced in recent amendments to around five per cent.

Last year, Iraq signed revised deals with Britain's BP, Italy's Eni and Russia's Lukoil, cutting final production targets and also lowering the share of the state partner to five per cent from 25 per cent, says the Reuters report.

Iraq is also reported to be looking at proposals to change the fixed structure of its payments to foreign firms, and to link payments to how much companies manage to lower production costs.

"There are proposals to link the profitability of the companies with the oil prices, and not just with a specific fee per additional barrel," Abdel Mehdi is reported to have said in a statement obtained by Reuters.

### Increased supply from Iran?

As for Iran, while the situation is still uncertain, by end-March the two sides could have produced a framework agreement outlining a deal. If so, an actual treaty could

be signed sometime around mid-year.

The Iranians are unlikely - given the dire state of their economy and the government's need to show direct results in order for any compromise to be accepted by political factions back home - to agree to any deal which does not provide significant easing of sanctions quickly. It is therefore possible that the USA and EU sanctions targeting Iran's oil exports and its ability to move money in and out of the country through the global banking system could be relaxed during the second half of 2015, in this hypothetical scenario. Raising Iranian exports with the roughly one million bpd of export capacity currently shut-in is likely to take more time than the government claims, but substantial amounts of additional supply could be expected within a quarter, and in 10-15 months 700-800,000 bpd of now shut-in production could well have re-emerged in the market, on top of significant inventories which Iran would want to clear.

This would mean that, should a deal be struck with Iran about its nuclear programme and sanctions be lifted, returning Iranian crude on the market could well outbalance declines in US shale production just as they would have started making a real difference, in the first half of 2016. The caveat is, however - apart from the obvious risk that there will be no deal in the coming months - that unwinding sanctions from US law, particularly in the current climate of political deadlock in the US Congress, might prove quite arduous, as it has in cases in the past. ■

# Oil supply: Not business as usual

Amid sharply lower oil prices, the IEA forecasts that a rebalancing of the market may be very different from the past.

**O**IL PRICES WERE heading back up by mid-February, but the International Energy Agency's (IEA) *Medium-Term Oil Market Report* makes disturbing reading nevertheless. In its market analysis and forecasts to 2020, the IEA says this period will be profoundly different from before, not only in the pace of supply growth, but also in the dynamics of upstream investment and production.

The plunge in oil prices has shattered assumptions the oil market had permanently entered an age of sustainably elevated prices, seemingly vital to some high-cost mega projects and to the budget requirements of many producer countries. The price collapse, however, has done more than just force companies and producer countries to slash spending and revise project economics. It challenges industry participants to recognise the rules of the market have changed.

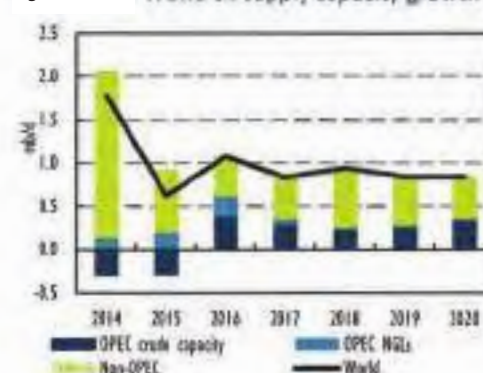
Most significantly, by unlocking a vast resource, US light, tight oil (LTO) has profoundly disrupted the traditional division of roles between OPEC and non-OPEC countries, at least for now. Non-OPEC producers cannot count on OPEC to act as swing supplier and to cut output when prices drop. While OPEC cannot be confident that non-OPEC supply is at its limit and incapable of being scaled up quickly. The advent of LTO has made non-OPEC supply far more price elastic than in the past. On the other hand, demand has become far less price elastic. This suggests the market response to this sell-off will be swifter, but also perhaps less violent than those to earlier price declines of a similar magnitude.

## Incremental supply

The other consequence of recent market changes is that the geographic distribution of incremental supply has been profoundly transformed as the producer response to the price collapse varies greatly by country. Surprisingly, neither the price drop nor OPEC's policy to maintain its 30mn bpd production target, however significant the impact, seems likely to change the Americas' role as the main engine of non-OPEC supply growth in the medium term. North America and Brazil, despite major cutbacks in investment, remain the largest source of world supply growth, led by the USA.

US LTO growth is expected to slow significantly in the early part of the forecast period in response to low prices. Cuts in LTO investment will be faster to translate into actual supply cuts than those in other

Figure 1 World oil supply capacity growth



Source: IEA

projects with longer lead times. Much for the same reason, LTO production growth will also be faster to come back on the rebound. Questions do remain about the availability of capital to LTO producers, but relatively speaking any investment cutbacks are not expected to have a long-lasting impact.

Barring any new major output disruption within OPEC itself, lower prices are expected to cut non-OPEC oil supply growth to an annual average 570,000 bpd per year, down steeply from record gains of 1.9mn bpd achieved in 2014 and from 1mn bpd on average over the last five years.

Despite OPEC's stated policy of defending market share, it is only expected to contribute roughly one-third of global capacity growth. OPEC is expected to lift crude oil output capacity to 36.2mn bpd by 2020, with annual average growth limited to 200,000 bpd. Most of this increase is likely to come from Iraq, although this is subject to political instability risk (see Figure 2).

Within OPEC, longstanding divisions in oil policies and price appetite have been exacerbated by recent market conditions. GCC

Table 1 Estimated sustainable crude production capacity (mb/d)

	2014	2015	2016	2017	2018	2019	2020	2014-20
Algeria	1.17	1.14	1.10	1.06	1.02	0.98	0.95	(0.22)
Angola	1.77	1.80	1.80	1.84	1.86	1.86	1.86	0.09
Ecuador	0.57	0.57	0.57	0.58	0.59	0.59	0.59	0.02
Iran	3.80	3.80	3.80	3.60	3.60	3.60	3.60	(0.00)
Iraq	3.86	3.90	4.10	4.22	4.33	4.52	4.73	1.07
Kuwait	2.86	2.82	2.84	2.84	2.83	2.80	2.76	(0.10)
Libya	0.85	0.50	0.65	0.75	0.81	0.87	0.98	0.13
Nigeria	1.98	1.82	1.91	1.90	1.89	1.88	1.88	(0.06)
Qatar	0.73	0.70	0.70	0.71	0.72	0.73	0.73	(0.00)
Saudi Arabia	12.38	12.34	12.42	12.49	12.46	12.41	12.39	0.01
UAE	2.90	2.94	2.98	3.03	3.10	3.15	3.21	0.31
Venezuela	2.58	2.49	2.45	2.40	2.45	2.51	2.56	(0.00)
<b>OPEC</b>	<b>35.03</b>	<b>34.73</b>	<b>35.12</b>	<b>35.41</b>	<b>35.85</b>	<b>35.91</b>	<b>36.24</b>	<b>1.22</b>

Source: IEA

“The geographical distribution of incremental supply has been profoundly transformed”



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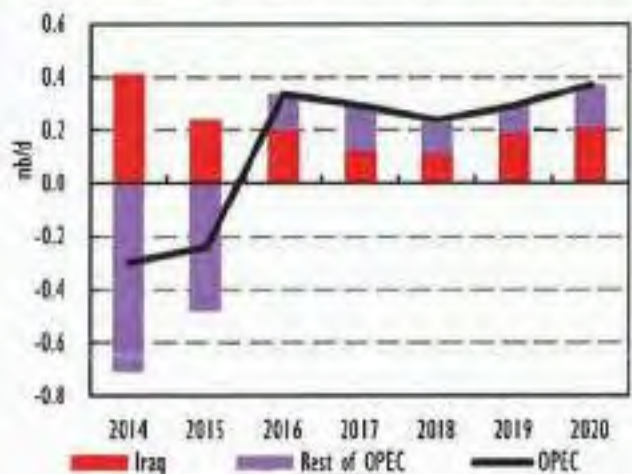
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Figure 2 Capacity growth: Iraq vs rest of OPEC



Source: IEA

countries on balance though look poised to adjust reasonably well, thanks to their relative political stability, low production costs, technological know-how, oil-sector professionalism and ample cash reserves.

With expectations of global supply growth for the next six years significantly reduced, below is a brief outline of what the report says about the region's individual national prospects.

### Iraq boosts capacity against all odds

Iraq leads in boosting capacity over the review period; output capacity is projected to expand by 1.1 mn bpd by the end of the decade, to 4.7 mn bpd, accounting for nearly 90 per cent of OPEC's total forecast growth. As a result, Iraq could account for an even larger majority of OPEC incremental capacity than previously forecast (assuming international sanctions on Iran remain in place).

However, there are considerable risks to this report's forecast, including Iraq's security, financial, logistical and institutional hurdles, but to the upside are its vast, low-cost resources and severe budgetary pressure to maximise production. The oil-price collapse and an Islamic State in Iraq and Levant (ISIL) insurgency have so far not succeeded in slowing its impressive production growth. By December 2014, defying expectations, production had surged to a monthly average of 3.7 mn bpd, a 35-year high.

Gains have been made in Iraq's three main producing regions. In the north, the new government of Iraqi Prime Minister Haider Abadi has moved to reach a permanent resolution to the long-running feud with the Kurdistan Regional Government (KRG) over oil and exports. The two sides struck an end-2014 deal that facilitated KRG crude exports and reopened an outlet for Iraq's northern exports which had been shut in for nearly a year by Islamist forces. Meanwhile, in the giant oil fields of the south, new oil minister Adel Abdul-Mahdi has been more willing to tackle poor infrastructure, administrative procedures and logistics.

However, at least in the early years of the forecast period, ISIL is likely to remain a major threat, which slows investment in the north. And, with very little cash reserves, Iraq may have limited capacity to pay international oil companies for development work in the south. To

make the most of Iraq's southern oil fields, it is crucial to get a long-delayed water injection scheme, which underpins Iraq's massive upstream expansion, up and running. In the shorter term, the lack of adequate pipelines and storage tanks is further constraining output.

### Saudi Arabia

Saudi Arabia is expected to sustain production capacity near its official 12.5mn bpd target throughout the forecast period. It has a hefty cash cushion that could see it through several years of low oil prices.

To maintain current capacity, new oil fields are due to come online to offset ageing production. Riyadh is striving to maintain, rather than boost, oil output capacity as it seeks to develop non-associated and conventional gas reserves. Gross capacity additions of 550,000 bpd are expected to be brought online during the forecast period following the ramp-up of the offshore Manifa field's capacity to 900,000 bpd at the end of 2014.

If required, Saudi Arabia could increase capacity beyond its target. Three fields could add a further 1.9mn bpd combined, namely Zuluf, Berri and Safaniyah, the latter being the world's largest offshore oil field.

### UAE

After Iraq, the UAE has the most significant medium-term capacity-boosting prospects – a projected rise of 310,000 bpd to 3.2 mn bpd in 2020. Abu Dhabi has said it will push ahead with an ambitious official target of 3.5 mn bpd by that year and has begun to award stakes for its onshore development activities, with France's Total winning the first. The expanded offshore Upper Zakum resource will be the principal means of achieving this target, with a boost of 250,000 bpd to 750,000 bpd. The project's completion date had already been pushed back to 2017 from 2015 before the oil price fell. Umm Lulu, Nasr and Satah al-Razboot (SARB) are also due to add to offshore capacity.

### Iran

A major supply boost could come from Iran, where production capacity is currently estimated at 3.6 mbpd. International sanctions have reduced output to roughly 2.8mn bpd over the past several years. Yet people familiar with the Iranian oil industry indicate that Tehran has the ability to raise output by around 800,000 bpd within months.

This forecast does not take a view on the outcome of negotiations with Tehran over its nuclear programme and assumes that sanctions remain in place throughout the forecast period.

The National Iranian Oil Company has already begun preparing for sanctions to end, making sure wells and processing units are up to scratch and pipeline systems tested. In fact, some of Iran's core oil fields may have been revived under sanctions: shutting down large volumes of oil may have allowed pressure to rise – leaving them capable of a swift production boost. Industry experts reckon it may take less than three months to ramp up output by 600,000 bpd to 800,000 bpd, thus lifting flows to 3.6mn bpd.

Iran's oil industry will require hefty investment as roughly half the country's production comes from fields over 70 years old. To that end, the Oil Ministry has prepared a new upstream contract for foreign oil companies, an improvement on the unpopular buy-back model. Tehran is also prioritising development of fields straddling the border with Iraq and are targeted to reach 700,000 bpd.

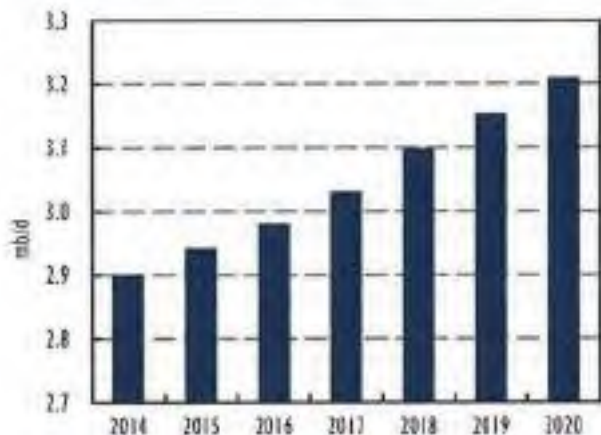
### Kuwait

Kuwait's capacity is expected to edge down to 2.8mn bpd by 2020, a decline of 100,000 bpd over the forecast period. In the near term, Saudi Arabia's unilateral closure of the jointly shared Neutral Zone oil field of Khafji is expected to put some strain on capacity. Despite the oil rout, Kuwait is pressing ahead with an extensive programme of

“After Iraq, the UAE has the most significant medium-term capacity-building prospects”



Figure 3 UAE crude production capacity



Source: IEA

drilling, well workovers and de-bottlenecking to raise production capacity. The giant Burgan field in southern Kuwait is also expected to benefit from a planned water injection scheme to help keep capacity at a steady 1.7 mmbpd beyond this decade.

Kuwait's official target is to reach capacity of 4 mmbpd by 2020 through investment of nearly US\$50bn, but this goal looked ambitious even before the fall in oil prices and the Neutral Zone situation.

Kuwait Oil Company has invited a number of major oil companies to express interest in several crucial projects, including the Ratqa oil

“Kuwait is pressing ahead with an extensive programme of drilling, well workovers and de-bottlenecking”

field, and has drawn up a new enhanced technical service agreement contract. The plan is to pump 60,000 bpd from Ratqa by 2018 and then ramp up to 120,000 bpd by 2025.

Strenuous domestic opposition to foreign involvement in Kuwaiti energy has, however, previously forced extended delays in projects in the past.

### Qatar

Qatar's crude oil production capacity is expected to recover by 2020 after slipping in the early years of the forecast period. It is relatively costly to develop Qatar's oil fields due to their complex geology, so raising capacity beyond 730,000 bpd may prove prohibitively expensive in the current low price environment.

Keen to breathe new life into its declining oil fields, Qatar Petroleum has been planning to redevelop the onshore Dukhan field and double the 45,000 bpd offshore Bul Hanine field to 90,000 bpd at an estimated cost of US\$11bn. A core component of the costs is the redevelopment of the ageing infrastructure and installation of new offshore central processing facilities.

Oil output in Qatar – the world's largest LNG producer – peaked at 860,000 bpd in early 2008 and has been on a downward trend ever since. ■

This article is based on the IEA's 2015 Oil Medium-Term Market Report and a speech to mark its launch on 10 February in London by the IEA executive director Maria van der Hoeven.  
[http://www.iea.org/bookshop/702-Medium-Term\\_Oil\\_Market\\_Report\\_2015](http://www.iea.org/bookshop/702-Medium-Term_Oil_Market_Report_2015)

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# Iraq – building foundations for a brighter future

The strongest response to the challenges Iraq faces is a unified one, says Samar Rassam, managing director of Somer Industrial Projects.

**D**ESPITE ITS TURBULENT history, Iraq remains a country of great potential, with a vast wealth of resources. Holding almost nine per cent of global oil reserves, it has a critical role to play in meeting the world's future demand for oil.

Another great resource coming out of Iraq is the people themselves who have an important role to play in building a united, peaceful and prosperous future – which the majority of us want to see emerge.

At a time when unity is vital in tackling Iraq's challenges, from the fall in oil prices to regional events and security threats, only through support and partnerships can responses to these challenges be effective.

The fall in oil prices is clearly having an impact, and it is important to focus on investment and the future health and prosperity of the energy sector. This is vital



*Samar Rassam, managing director of Somer Industrial Projects*

“Iraq has a critical role to play in meeting the world's future demand for oil”

in order to support long-term economic development throughout Iraq.

Revenue from the energy sector needs to be used towards Iraq's broader development in the areas of infrastructure, education, healthcare and improved services for the population. This investment must cover the whole of the country equally in order to create the right conditions for prosperity and a vibrant private sector.

## Overcoming challenges

There are many challenges ahead, but in order for a prosperous Iraq to become a reality, significant investment is required right now. Overcoming these challenges

requires a concerted effort by the Iraqi government, the Kurdistan Regional Government and all of Iraq's different groups. The strongest response to these challenges is a unified one.

In December 2014, Iraqi government and Kurdistan Regional Government leaders met in order to resolve issues regarding budget allocations and energy exports. An agreement was reached at this meeting which opened the way for the daily export of 250,000 barrels of oil from the Kurdistan Region of Iraq (KRI). The deal also envisages that the KRI will receive 17 per cent of Iraq's national budget each year, based on population percentages.

This agreement may prove to be the cornerstone in relations between the Federal Government of Iraq and the Kurdistan Regional Government. There are many unresolved issues existing in the region and the first step is to solve the

outstanding ones within the framework of the constitution. This deal will not only pave the way for an increasingly conducive political environment, but will also bring enhanced economic benefits to all communities.

There will be a series of visits to negotiate and conclude agreements for the benefit of the Iraqi people as a whole. The first visit took place in February 2015 when Prime Minister Nechirvan Barzani and a senior delegation from the Kurdistan Regional Government were received in Baghdad by Iraq's Prime Minister, Haider Al-Abadi and a number of Iraq's Federal Government officials. Two meetings were held which focused on the implementation of the December 2014 agreement.

An issue that was discussed was the inability of the Iraqi government to pay the Kurdistan Region's share of January and February's federal budget, as a result of

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the current financial crisis and the lack of liquidity. Both sides agreed to continuing talks to find an appropriate solution and reaffirmed their commitment to the December agreement.

The KRG delegation presented a timetable detailing the export of oil from their region and this was accepted by the Federal Government of Iraq.

## Looking to the future

Despite the substantial growth in US oil production in recent years this is forecast to peak in 2020. Then the world is expected to become ever more dependent on an Iraqi supply. By 2040, Iraq's crude oil production is projected to almost treble – to just over eight million bpd – the largest increase of its kind worldwide.

While the majority of Iraq's oil exports currently come from Iraq's giant southern oilfields, oil reserves in the Kurdistan Region of Iraq will play a significant role in this increase as the region is not only thought to be one of the largest untapped areas of oil in the world (estimated at 45 billion barrels with the possibility of another 25 billion barrels in unproven reserves), but it also has significant gas potential (estimated at 100-300 trillion cubic feet). Development and export opportunities in the Kurdistan Region will play an important role in the future energy sector of a united Iraq, which will be vital for its political future and stability.

A number of operators and vendors have already moved to the Kurdistan Region which has created an oil and gas employment boom. There are plans with nearby Turkey to implement pipelines to export oil from the Kurdistan Region to Europe.

Kirkuk has returned to production after the cessation of almost a year caused by sabotage of the oil pipelines. Today, Iraq is able to export from the Kirkuk oilfields.

## Training and capacity building

Another important issue for Iraq is investment in its people with regard to training and development, where business objectives and personal aspirations intertwine and result in increasing productivity. International operators in Iraq's oil and gas sector will be committed to conducting training of Iraqi workers, including raising the standards for health, safety and the environment.

Commercial expertise is crucial to success, and development plans have the potential to impact the whole workforce.

Consistent and structured training needs to be implemented throughout both technical and non-technical departments in the Ministry of Oil (MOO) in Iraq and the Ministry of Natural Resources (MNR) in the Kurdistan Region of Iraq. This could also

*The Kurdistan Region of Iraq is thought to be one of the largest untapped areas of oil in the world*



extend to universities, colleges, oil training institutes and training companies.

Special attention must be paid to discovering new markets, market research as well as Business-to-Business (B2B) and Business-to-Consumer (B2C) forecasting and analysis.

The teaching of problem-solving and decision-making skills within oil and gas management will have a significant impact on the economy. The efficient use of new technology is also crucial to productivity. International expertise and collaboration is sought in technology transfer as well as capacity building in areas such as management and technical training.

“The teaching of problem-solving and decision-making skills within oil and gas management will have a significant impact on the economy”

This will be a major step forward for the Iraqi people as a whole. It will enable them to rebuild their country and create a safe, sustainable and profitable oil and gas industry. They will be able to create a skills base through the use of standards and qualifications, best practice and proven learning products.

Iraq as a nation will be able to guarantee implementation of world-class industry standards and qualifications, which will enhance the nation's workforce and reputation. This is the foundation for a brighter future. ■

## Mott MacDonald joins with Khudairi Group to deliver Iraqi projects

MOTT MACDONALD HAS joined up with Khudairi Group to deliver oil and gas projects in Iraq. The move combines the consultancy's full range of engineering and procurement technical support services with Khudairi Group's procurement, inspection, expediting and construction management services.

Khudairi Group is a leading provider of solutions to the oil and gas and construction industries in Iraq, operating across three primary business units: engineering, procurement, construction (EPC); oilfield supply and services and heavy machinery. Mott MacDonald offers a full range of engineering services and was heavily involved in rebuilding Iraq's infrastructure. In the oil and gas sector Mott MacDonald was owners' engineer for the conversion of Arbeel Power Plant from simple to combined cycle. The consultancy also supported increased production from the Rumailah oilfield – the second biggest oilfield in the world.

Albert Allan, managing director of Mott MacDonald's oil and gas business, said, "I am delighted we are working in partnership with Khudairi Group. The initiative combines the strengths of both companies to offer our clients wide-ranging EPC services in this market.

"We are excited about a partnership that will combine Mott MacDonald's international engineering standards with Khudairi Group's local capabilities and experience on-the-ground in Iraq," said Mohammed Khudairi, executive vice-president of Khudairi Group. "Together, we will be able to capture more opportunities and support our current relationships with the Iraqi ministries and international oil companies, as Iraq continues to rehabilitate its infrastructure and focus on new projects."

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## Genel Energy looks to increase production

GENEL ENERGY, THE largest independent oil producer in the Kurdistan Region of Iraq (KRI), is looking to achieve gross production capacity of 200,000 bpd from its Taq Taq and Tawke fields in 2015, according to the chairman's statement issued with the company's 2014 full year results. These fields have a currently estimated gross proven and probable (2P) reserves of 1.2bn barrels of oil (429mn barrels net to Genel Energy) and gross proven, probable and possible reserves of 1.7bn barrels of oil (614mn barrels net to Genel Energy) respectively, according to the company.

"With export infrastructure in place, in 2014 Genel has focused on its producing operations in the KRI," said the statement. "Production at Taq Taq and Tawke increased by more than 50 per cent, and the low cost of this production is a clear advantage at a time when the oil price has fallen significantly. A similar rise in production is expected in 2015. Oil exports are crucial to the economy of the KRI, and we will continue to underpin the success of the Kurdistan Regional Government (KRG) through helping facilitate the sale of gas by the KRG to Turkey. Agreement for the development of our Miran and Bina Bawi fields, reached with the KRG in November, will unlock a world-class gas resource and will assist the KRG to satisfy both domestic gas demand and its obligations to Turkey.

"We are proud of the integral role that Genel has played in the growth of the KRI oil industry. We expect our KRI operations to be significantly cash generative in coming years, despite the significant drop in the oil price."

The statement noted that the KRI's pipeline exports rose throughout 2014, reaching more than 400,000 bpd by the end of the year. This is also set to increase significantly in 2015. Increased exports were matched by successful tanker liftings and sales, and the second half of 2014 saw KRI crude being sold by the KRG on the international market.



## Unaoil contract win

BASRAH GAS COMPANY (BGC) has awarded UnaE&C Iraq, an engineering and construction subsidiary of Unaoil Group, a contract for the Rehabilitation of West Qurna Compressor Stations CS7 and CS8 at West Qurna, Iraq. BGC is a joint venture between state run South Gas Company of Iraq (51 per cent), Shell (44 per cent) and Mitsubishi (five per cent).

The project will enable flared associated gas generated from Degassing Stations DGS7 and DGS8 in West Qurna to be collected, compressed and dehydrated prior to being sent via pipeline to the downstream gas treatment plant at North Rumaila NGL Plant for further processing. UnaE&C's scope of work includes project management, procurement, fabrication, installation and construction of the related works. Unaoil's operating centres in Dubai and Basra will support the project execution.

Cyrus Ahsani, CEO of Unaoil Group said, "This is an excellent opportunity for Unaoil to utilise our local capabilities and deliver this important project to the high international standards expected by BGC."

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# Promoting employee retention and engagement

Rayed Al Eskandrani, talent development manager, Middle East and Pacific region, Baker Hughes, discusses the company's focus on the training and development of its field engineers.

IN COMMON WITH its counterparts in the oil and gas industry, Baker Hughes is facing HR challenges such as the big crew change, achieving a diverse workforce, improving employee retention and attracting local talent.

"It was the prospect of the 'big crew change,' with a large proportion of the seasoned members of the workforce set to retire in the next 10 years and a shortage of experienced people to replace them, that was the key driver for the establishment of our field engineering development programme, which has now been running for four to five years," says Al Eskandrani.

"We handpick the best engineering graduates and put them through a three-year intensive structured training programme including on the job training, on-line training and facilities training. They graduate from this programme as general field engineers having reached a level of competence whereby they are able to run most of our basic technologies and services as well as some of the more advanced ones."

“ Training and development are underpinned by a highly structured competence management programme ”

Once they have completed the programme, graduates can choose to stay in the field or move into a different branch of the business.

Hands-on training at the state-of-the-art education centre (see box), is a key element of the programme, preparing the trainees for life in the field through the experience of true life scenarios. "The trainee field engineers come straight from university and often have no idea of what working on a rig involves," comments Al Eskandrani.

*The Baker Hughes training rigs enable trainee field engineers to experience what it is like to work on a rig*





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“We give them basic rig exposure and teach them to do everything in a safe and controlled environment before we deploy them in the field. This also helps to manage expectations – they gain an impression of rig work as being tough but rewarding.”

Training and development are underpinned by a highly structured competence management programme (CMP) rolled out at the end of 2013, the first such programme run by a service company to receive accreditation from the International Association of Drilling Contractors (IADC).

“We have a qualification for each service we run, involving basic training here, basic online training, basic job exposure and an assessment,” explains Al Eskandrani. “We are having a big push to qualify everyone for every service that we run. The CMP gives a clear picture of the competencies and skills of each individual and of the skills gaps that need to be addressed.”

### Focus on retention

Every effort is made to retain and engage employees at every stage of their career, from the moment they join the company. “I took up my post in early 2014 with a big focus on managing our talent, creating career development plans, and looking at how we can improve the engagement, motivation and retention of our field engineers,” says Al Eskandrani. “There is a big drive to retain our people, engage them, develop them and give them the right tools and support to stay with the company – we believe this is a company where people can stay forever. This year we have a big target for retention – we have a campaign called ‘Everyone stays,’ involving

webinars and other initiatives, which is having a positive and measurable impact on our retention rates.

“The statistics show that lack of career development or lack of a clear career path is one of the main reasons for moving on,” he explains. “We develop people from the moment they join the company right up to executive level; each employee has their own customised training programme. Everyone has the opportunity to learn about different aspects of the business and receives the development and opportunities they need to get to the next level; we try to keep everyone engaged and challenged.”

“We develop people from the moment they join the company right up to executive level”

“We also go through talent identification cycles involving a rigorous process to identify and develop high potential employees and future leaders, giving them the development and opportunities they need to reach the designated level at the expected time, whether it be through international exposure, working in a different function or on a different product line, being put in charge of a larger team, or through increased financial responsibility.”

Al Eskandrani exemplifies this process well himself, having started his career at Baker Hughes as a directional drilling engineer, then moving to an office-based

post as drilling systems manager, followed by a post in Egypt as sales and marketing manager, and finally making the leap from operations to HR, where he is responsible for the training and development of 9,000 employees.

Mentoring receives considerable attention – all field engineers participating in the three-year training programme now have mentors, and under the high-level leadership programme high-potential employees are mentored by vice presidents of the company. In the latter case, the mentor will be from a different discipline or function to the mentee to facilitate cross-fertilisation and the alignment of corporate functions.

### Promoting diversity

Baker Hughes is striving to increase the involvement of women in the industry, and has set a target of a minimum 30 per cent female graduates per year.

The oil and gas industry in general does not have a good record in recruiting women due to the tough working environment and there are particular cultural obstacles in the Middle East.

Baker Hughes has introduced a number of initiatives to address such challenges, such as deploying successful female field engineers in its university recruiting team. These women act as role models and target female students at university career events, allaying misconceptions and presenting a positive image of a career in the oil industry for women.

“We are very proud of this initiative,” comments Al Eskandrani, noting that Oman’s first female directional driller had worked for Baker Hughes on a Petroleum Development Oman (PDO) project. “If we want a more diverse leadership, we need to give women the experience of working in the field, which is where most of our leaders have started,” he adds. Where there are particular obstacles – as in the case of Saudi Arabia, women can be sent on an international assignment programme elsewhere for their rig training before returning to their home country. Once with the company, women are given full support, such as joint postings for married couples.

### The leading edge

At the end of the day, having a skilled and engaged workforce is key to Baker Hughes maintaining its leading edge.

“Look at the pioneering role we are playing in unconventional and shale gas technology, and the introduction of innovative products such as the first Intelligent Production System worldwide,” says Al Eskandrani. “To have the best technology in the world, you need to have the best people to plan, develop and execute it. Our people are our assets.” ■

**The technical workshop at the Baker Hughes Eastern Hemisphere Education Centre**



## Baker Hughes' Eastern Hemisphere Education Centre (EHEC) offers learning opportunities

VISITORS TO THE Baker Hughes Jebel Ali premises are greeted by the sight of two full-sized training rigs. These are standout features of the company's Eastern Hemisphere Education Centre (EHEC), which offers a variety of learning opportunities for Baker Hughes employees from Europe, Africa and Asia Pacific, playing a particularly valuable role in facilitating hands-on training for its field engineers. The centre can accommodate up to 350 students per day and has a similar set-up to the Western Hemisphere Training Centre which opened in 2014 in Houston.

*Oil Review Middle East* was privileged to be given a guided tour by the manager of the centre and his staff, and was struck by the range of state-of-the-art equipment, from the huge cantilever for the calibration of wireline tools, to the centrilift electric submersible pump system and sophisticated logging while drilling tools.

The centre includes classrooms, break-out rooms, auditorium, laboratory and a 20,860 sq-ft (1,938 sq-m) technical workshop. The workshop includes simulation rooms and allows for hands-on training in all product lines, from drilling systems and wireline, to completion and pressure pumping. The facilities are currently being expanded to accommodate increasing numbers of students and the growing number of product lines.

The 88,695 sq-ft (8,240 sq-m) yard includes seven test wells that offer hands-on experience of well operations for students taking part in technical training and competency programmes. Four are



used for wireline, one for artificial lift, and students can drill, pump, and make up and run tools.

The training rigs are installed over the two deepest wells (870 metres and 570 metres) to allow for running of a variety of tools, and include two classrooms with windows for observation.

Interactive learning methods feature prominently at the centre, with smartphone apps, learning games and simulations designed to engage students and enable them to explore real-life scenarios; at the time of *Oil Review's* visit a coiled tubing well intervention simulation class was underway (run, incidentally, by a female tutor) allowing students to simulate rigging up a coiled tubing unit and running it in the well.

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## Saudi Aramco to partner with Dow on US\$20bn project

STATED-OWNED COMPANY, Saudi Aramco, will enter a US\$20bn petrochemicals deal with Dow Chemical, with plans to begin oil production in the second half of this year.

The project, known as Sadara Chemical, will be the first project in the Gulf to use naphtha as feedstock, said Khalid Al Hamid, the manager of engineering and technology at Sadara, in which Brent prices have almost halved since June 2014.

The Sadara project, which will produce three million tonnes of petrochemicals a year, is set to be constructed in a single phase. Saudi Arabia is also launching a number of petrochemical projects, despite the drop in prices for crude oil. The fall in prices has affected earnings at most companies in the sector.

Rising domestic consumption of energy products and fall in gas production, could

affect further projects, said Raheel Shafi, a senior consultant for the Middle East at Nexant, a consultancy company.

“In the GCC, most countries are faced with these challenges when it comes to gas feedstock,” said Shafi.



**The Sadara project plans to produce three million tonnes of petrochemicals a year**

## GPCA survey finds petrochemicals industry puts innovation top

ALMOST 80 PER cent of the GCC region's biggest petrochemical and chemical producers have put innovation at the top of their list of priorities, showing that the modernisation of the sector is a key focus for companies, a new survey by the Gulf Petrochemicals and Chemicals Association (GPCA) noted.

Figures for the number of companies that have formulated an explicit innovation strategy have doubled from 21 per cent in 2010 to 41 per cent in 2015. In addition, 38 per cent of surveyed companies in the Gulf's chemical industry are considering whether to roll out an innovation strategy. The survey highlighted that an innovation strategy is expected to be a priority over the next decade.



**Dr Ernesto Occhiello, executive vice-president, Technology and Innovation, SABIC**

“Over the last four decades, the GCC's petrochemicals industry has evolved from humble beginnings into a multi-billion dollar industry, which has more than 140mn tonnes capacity that has applications in a host of sectors,” said Dr Abdulwahab Al Sadoun, secretary general of the GPCA.

“And as growth forecasts indicate stable progress, the latest GPCA Innovation Survey shows that the region's petrochemical producers are increasingly looking towards applying a meaningful innovation mandate to stay relevant in the face of rising market competition.”

The GPCA Innovation Survey examines the views and priorities of the region's key petrochemical producers. This year, the survey spoke to 24 manager level or above executives throughout the Gulf, representing 70 per cent of GPCA full member companies.

The GCC's chemical industry invested an estimated total of US\$367mn on research and development in 2013.

## ICIS to issue data insight into petrochemical industry

CONSULTANCY SERVICE COMPANY ICIS has released a new supply and demand database to search and analyse market data of global petrochemical and energy sectors database. The supply and demand database allows sorting data related to historic and emerging market trends.

Paul Ray, head of consulting and analytics at ICIS, said, “This new supply and demand database is an invaluable tool designed to help users to make confident, long-term decisions and gain greater insight into global petrochemical and energy markets. This online database provides senior management with the data, market context and expertise to support their research, planning and acquisition strategies.”

The energy, refining and petrochemical sectors have had to make major adjustments and review portfolios - since the global economic slowdown, stated Ray.

“Companies have been forced to make shrewd investments, making accurate historical and forecast data essential to support decision-making, especially when looking long-term across such volatile markets,” he noted.

## Expected rise in global M&A chemical activity

THE GLOBAL CHEMICALS industry is expected to see a rise in the number of mergers and acquisitions (M&A) in 2015, according to the fourth issue of the *Chemicals Executive M&A Review* by AT Kearney, a global management consulting firm. According to the survey, activist investors are likely to put pressure on chemical companies to divest assets seen as not performing as expected, acting as a driving force for the increase in deals. Mainly in North America, activist investors have pushed for portfolio restructuring of large chemical companies with diversified portfolios such as Dow Chemical and DuPont.



**The global chemicals industry will see a rise in the number of mergers and acquisitions (M&A) in 2015**

“Activist investors are putting pressure on the management of some of the most prominent chemical majors to streamline their business portfolio. So far this trend is most predominant in North America, but as a consequence of increasing fund sizes and a scarcity of underperforming assets in North America, we expect shareholder activism to also grow in Europe and Asia,” said Joachim von Hoyningen-Huene, a partner at AT Kearney.



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## SABIC launches new range of non-phthalate polymer products in Riyadh

SAUDI-BASED PETROCHEMICALS firm, Saudi Basic Industries Corporation (SABIC), has rolled out a new range of products based on non-phthalate catalysts, developed at its technology centre in Riyadh, to meet customer demands for key solutions in various areas, including hygiene fabrics and flexible packaging.

The firm said its polypropylene products which were introduced back in February will use non-phthalate catalysts, while BOPP (Biaxially Oriented Polypropylene) film will be launched sometime later this year.

Mosaed Al-Ohali, SABIC Polymers, executive vice-president, stated, "With our new polymer range, SABIC will offer a broader choice to customers in fibre and flexible packaging segments, as part of its 2025 strategy for differentiation and creating value. We are a trusted leader in the plastics industry and are constantly adopting strategies to cope with the industry's emerging requirements and challenges, and position ourselves to take advantage of new market opportunities."

Also commenting on the new product,

Ernesto Occhiello, executive vice-president, SABIC Technology and Innovation, said, "Our technology teams have adapted and responded to changing market requirements. We are relentlessly pursuing innovative technologies to bring about broad-based improvements in our products and will maintain this momentum for meeting changing market requirements."

SABIC specialises in the production of polyethylene, polypropylene and other advanced thermoplastics, glycols, methanol and fertilisers.

## Jazan Economic City to boost Saudi economy with new projects

WITH A FOCUS on the energy and manufacturing industries, Jazan Economic City is expected to become a key contributor to Saudi Arabia's economy as current infrastructure and project development will drive further investments in heavy and secondary industries, petrochemicals, mining and conversion industries, Khalid A. Al-Falih, president and CEO, Saudi Aramco said at the Jazan Economic Forum in Jazan City, located in southwest Saudi Arabia.

The event welcomed more than 500 Saudi Arabian and foreign dignitaries and business leaders, who had the opportunity to discuss investment opportunities at the Jazan Economic City project.

HRH Prince Mohammed bin Nasser bin Abdulaziz Al Saud, governor of Jazan Province, HE Ali bin Ibrahim Al-Naimi, minister of petroleum and mineral resources, HE Abdullatif A. Al-Othman, governor of Saudi Arabian General Investment Authority (SAGIA) and Saudi Aramco's Al-Falih inaugurated the forum.

According to Al-Falih, the firm was keen to be involved in the development of Jazan. Jazan Economic City was part of the Saudi Government's plans to set-up economic bases across the kingdom to achieve a diversified economy and balanced regional development.

"The Jazan Economic City vision seeks to invest in the region's natural resources, diverse geographic features and human resources to make a major positive difference to the area's future, so that Jazan will become a significant contributor to the kingdom's economy," said Al-Falih.

Saudi Aramco will construct Phase I of the project, which will involve smart infrastructure, revealed Al-Falih.

"Saudi Aramco has been entrusted to build Jazan's strategic infrastructure through the development of a refinery and terminal, a power plant, a commercial seaport, a water desalination plant, roads and water and



Khalid Al-Falih,  
President and CEO  
of Saudi Aramco

sanitary drainage systems, in addition to connecting electricity," he said.

Saudi Aramco has been rolling out a number of training initiatives to improve the skillset of its workforce, mainly for youth in the area who will be tasked with different jobs during all stages of the project.

"The Saudi Aramco – TVTC alliance is an innovative strategic partnership with the refinery project's contractors training and employing 5,000 young people from Jazan in various construction-related professions and crafts over four years. Longer term, we aspire for the number of jobs available in Jazan to reach 75,000," said Al-Falih.

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*Oil and gas companies have realised the need for secure fire protection and are incorporating measures to avoid mishaps*

# Profits riding on safety

The fire safety market in the Middle East is expected to grow 14.4 per cent by 2018, and project developers are focusing on fire safety measures on critical infrastructure projects in the Middle East.

COUNTRIES IN THE MENA region are expected to spend US\$755bn in energy projects until 2019, stated Arab Petroleum Investments Corporation (APICORP) recently. Of the projected spend, 31 per cent will be spent on oil and 27 per cent on gas. Despite the fluctuating price of oil, there is stability in oil and gas projects in the Middle East. While oil and gas is one of the major drivers of the economy, the industry is also considered among the most hazardous. Oil and gas companies are increasingly taking the issue of safety seriously.

Frost & Sullivan's analysis has revealed that the region's fire safety systems market is expected to grow 14.4 per cent by 2018 as end users are investing in safeguarding critical infrastructure projects. At Intersec 2015, held in Dubai in January, fire and rescue was the fastest-growing section with leading names such as NAFFCO, Bristol, SFFECO, Hochiki, Eaton, Honeywell, Unisafe, UL, Oshkosh, DuPont, Draeger and GENTECH displaying their products at the show.

The potential US\$70bn fire safety market has now garnered the attention of governments in the Middle East. Several regulations spurred by government bodies have helped the fire safety market gain traction in the region. In addition, civil defense authorities are playing a notable role in spreading awareness. They have provided impetus for innovations in fire safety as well. For instance, the Human Machine Interfaces (HMI) have gone a long way in fire detection.

Advanced fire alarm systems now work on digitised voice technology. Early suppression fast response (ESFR) sprinklers are also in demand now. DuPont's FM-200® systems offer an ideal combination of the properties desired in a waterless agent characterised by extremely low toxicity. FM-200® is being treated differently than HFCs in other more emissive applications due to

its negligible emission, as evidenced by the recent regulatory decisions of the US EPA and the revised F-Gas II Regulation.

Companies that have recognised the need for enhanced fire detection systems and safety are also working on public service campaigns to spread awareness. UAE's Ducab launched PowerOverFire in 2013 – a mobile roadshow, which dispensed information to the general public across the UAE. The truck also featured touch-screen kiosks and a classroom for seminars to discuss fire safety.

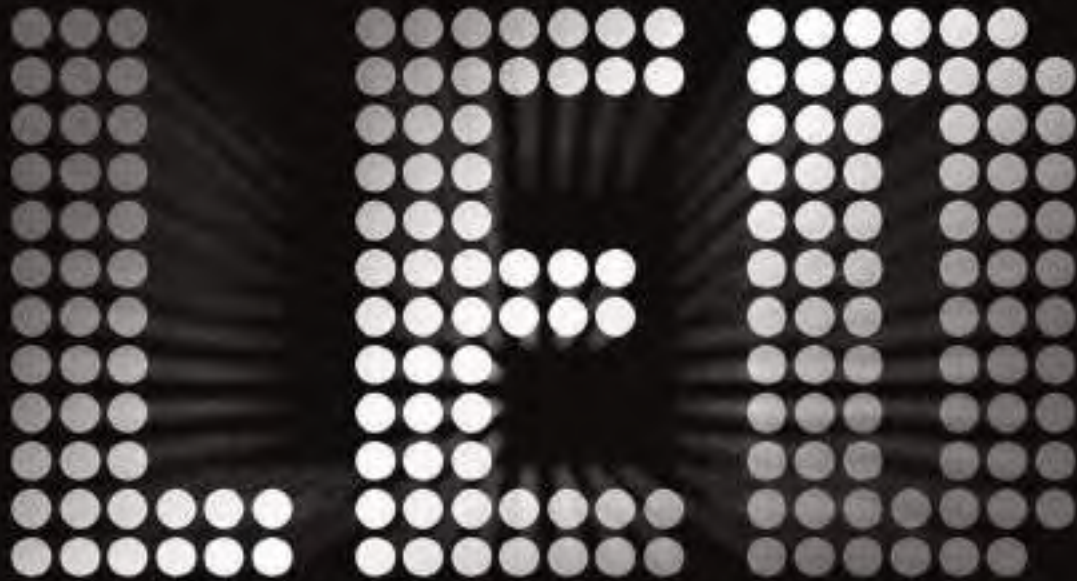
*Peter Stephenson, associate director of BuroHappold Engineering shares his insights on the significance of fire safety in the oil and gas industry below.*

## **The construction boom in the Middle East directly raises attention on fire safety. How equipped are buildings in the Middle East to handle any mishaps?**

There are two key elements that need to be considered when looking at building fire safety. Firstly, we need to consider the fire safety and protection systems that are provided as part of the initial building design. Early appointment of a qualified fire engineer as part of the design team is critical to ensure that an appropriate fire strategy is developed that satisfies the relevant fire codes, the client's requirements and provides a safe building for occupation. The second key factor is the ongoing fire safety management of the relevant building(s) including the maintenance of all fire safety and protection systems (sprinklers, fire detection and alarms, etc.) If these systems are not properly maintained in accordance with the fire strategy along with the introduction of robust fire safety management procedures and policies, the long-term safety of the building occupants could be compromised in the event of a fire incident.



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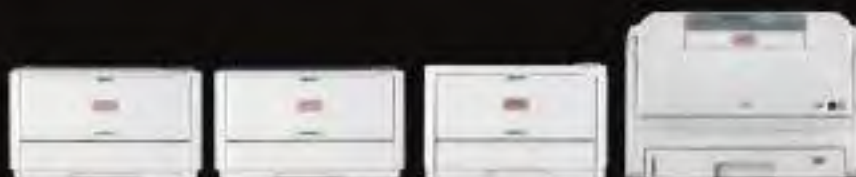


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### What are the latest innovations being spearheaded in the field?

There is always innovation within the fire sector, particularly relating to fire suppression systems (gas systems, aerosol systems, water mist, etc.) along with fire detection systems (video smoke detection).

The approval standards and codes, however, do not often evolve fast enough to accommodate new technology, which can result in a delay for a product entering the market. New firefighting techniques, training and equipment is very active at the moment as a result of the construction boom in the Middle East, along with awareness for the requirements for 'green' and sustainable products.

### How profitable is the Middle East market in the field of fire safety?

The market is always very active during periods of construction, which also results in a competitive tendering process.

What is important is not to compromise the quality of products due to cost as this could be a critical factor in the event of a fire incident. With large infrastructure projects in Saudi Arabia and Qatar, the market remains strong for quality and competitively-priced systems.

### Are there any particular trends in the market that you have noticed and what can you tell us about them?

There is a greater awareness regarding the need for fire safety training across the sector from fire warden training through to

understanding fire codes used in the region. Greater awareness regarding product specification, particularly gas suppression systems and selecting the most appropriate system for the risk being protected. Following recent high-rise building fires, general fire safety awareness and the importance of responding to a fire alarm remain in the public focus. Resilience across the region and disaster management are also receiving a lot of attention.

### What are the most lucrative industries for fire safety?

Infrastructure (aviation and rail) remain strong sectors along with the oil and gas sector. With works progressing towards Expo 2020 Dubai, the leisure and entertainment sectors remain buoyant, which will support retail and residential development.

### Commonly, what mistakes are made by developers with respect to fire safety? Are there any safety norms that are overlooked?

From the start of a project it is important to have a qualified fire engineer as part of the design team. Far too often fire safety is an afterthought and only becomes a priority when approvals are required from the local authority.

Developers need to consider the operational response by civil defence to an incident to ensure that the correct access and firefighting facilities are provided.

This is essential throughout the complete lifecycle of the building as many fire incidents happen during the initial construction phase which can cause long delays to a project and be very costly. ■

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# Focus on preventing commodity releases

Lars Larsson, senior product manager, Schneider Electric, outlines strategies to maintain pipeline integrity and help prevent a commodity release.

**P**IPELINE INTEGRITY IS a term that encompasses many things today, but basically means that the pipeline is working properly. Meanwhile, pipeline integrity management is simply defined as a comprehensive management programme carried out by pipeline companies to ensure a hazardous commodity is not inadvertently released from a pipeline and to minimise the impact if a release does occur. Obviously, this is a top concern for all pipeline operators.

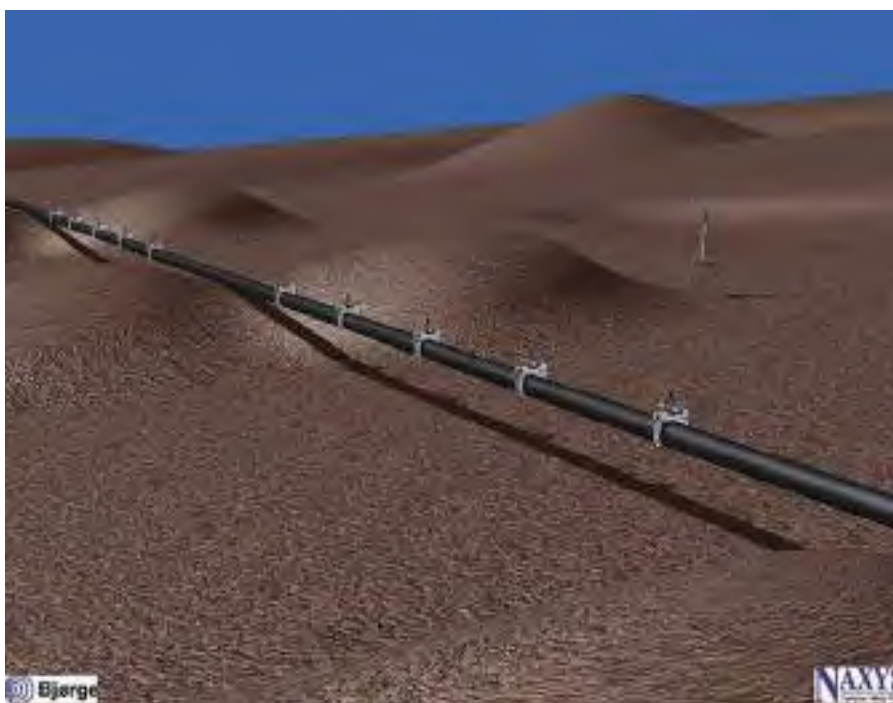
As a result, pipeline integrity management becomes a layered process of prevention, detection and mitigation of failures. Although each of these categories is critical to minimising the harm to pipeline operations and the surrounding environment, regulators, pipeline companies and, even vendors, have focused primarily on detection strategies and best practices from a real-time monitoring perspective.

In many ways, this makes sense, as most of the information gathered and actions associated with detection occur in real-time, and the consequences of failure in this area is predictable, immediate and often grave.

However, we must ensure that, as an industry, we continue to place as strong, if not a stronger, emphasis on attempting to prevent an unscheduled commodity release from occurring in the first place. Rather than focusing strategies and investment on reacting to potential issues, pipeline operators can be taking significant proactive steps in real time to avoid unscheduled commodity releases. As they say, the best defence is a good offence.

## Design and construction factors

Designing and constructing a pipeline sounds easy enough, but any pipeline engineer will tell you there are any number



*Terrain and weather have significant impacts on pipeline operation (Photo: Naxys)*

“ The best defence is a good offence ”

of moving parts associated with ensuring the right products can get from point A to point B efficiently, safely and without generating excess risk of a commodity release. Most importantly, pipeline construction needs to be undertaken by looking ahead to the full desired lifespan and operational breadth of the pipeline.

For example, terrain and weather have significant impacts on pipeline operation, with different effects on flow dynamics depending on the product being transported. A cheap and simple pipeline construction following the shortest route from supply point A to delivery point B may be more expensive for the operator in the long run if that route includes unsafe elevation changes, or if the pipeline will need to connect future supply points and

transport additional products in the future. Operators need to consider the long-term design lifespan of a new pipeline to determine all the different possible supply and delivery points and commodity types that might travel through the pipeline. Using these variables, operators and their engineers can use steady state simulation tools to test and analyse the hydraulic profiles of multiple scenarios to select a route, and the right pipeline construction elements, that will provide maximum safety and operational efficiency.

This will also help operators consider other critical factors, such as internal and external corrosion protection, allowing them to properly estimate the need for corrosion inhibitors, coatings and cathodic protection.

One way to minimise external effects on pipeline integrity, such as weather or human activity, is to bury the pipeline, which is how the majority of pipelines are currently being constructed. Regulations do govern the minimum depth of cover depending on the land and environment crossed by the



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pipeline, but, even recently, there have been examples where leaks occurred because, unbeknownst to the operator, the cover over the pipeline had been reduced to dangerous depths. To prevent this and stay regulatory compliant, electronic equipment is now available to assist in monitoring pipeline depth in conjunction with GPS targeting to track the exact location of any identified issues and dispatch field crews.

### Operation and maintenance factors

Once the pipeline is completed, operators need to ensure that pipeline integrity is maintained, or even improved over time. It is recommended the pipeline is exposed straight away to hydrostatic testing to prove the integrity of the materials used and to identify any potential leaks. Many pipeline companies perform the same type of hydrostatic testing on a yearly basis to verify the integrity of the pipeline or pipeline segment has not deteriorated. Real-time hydraulic simulation models can assist during these shut-in scenarios.

While hydrostatic testing identifies potential risks through monitoring real-time data, getting a visual inspection of both the inside and outside of the pipeline is critical, either to identify the source of real-time data anomalies or to find previously unidentified risk areas. External integrity inspection has improved significantly with the installation of advanced camera systems and use of remote-controlled drones. Internal integrity inspection has also improved significantly with the use of Inline Inspection (ILI) technology, often known as 'smart pigs'. These smart pigs are transported periodically in pipelines and carry high-resolution visual equipment capable of detecting corrosion, dents and other integrity concerns. ILI

“ Pipeline operators can take significant steps to improve pipeline integrity by adequately training both their controllers and the general public ”

vendors have increasingly advanced technology for assessing the data collected by the pigs, which when integrated with the data from the real-time hydraulic model during normal operation or hydrostatic testing can provide critical insights on maintaining pipeline integrity.

Maintaining proper calibration of monitoring devices is also critical to maximising the value of real-time prevention monitoring. Most measurement devices drift away from the original calibration settings over time. However, operators need to confirm whether this is a natural slide by the device, or indicative of a pipeline integrity issue, and respond accordingly. While this sounds like a simple task, with hundreds of monitoring devices per pipeline, having a maintenance programme in place to ensure instrumentation is being calibrated correctly with an acceptable frequency is very important, especially for pipeline companies that rely on real-time hydraulic models to assist them in monitoring their pipeline.

### Human factors

Fortunately, or unfortunately, humans are one of the most critical factors in leak prevention, either as the primary preventative measure, or the primary cause.

Pipeline operators can also take significant steps to improve their pipeline integrity by adequately training and educating both their controllers and the general public, as well as providing controllers the early detection tools to keep commodity releases from occurring.

Controller training and their operating conditions are two prevention elements that are highly regulated, primarily because they also have a significant impact on detection and mitigation. Clear industry guidelines exist around proper controller training, specifically using tools to create a flight simulator environment where controllers train and re-train on replicas of the SCADA system and virtual pipeline models, experiencing specific scenarios imposed by training officers. It is essential that these training programmes not only qualify controllers in the areas of detection and mitigation, but provide extensive experience for prevention.

Similarly, regulations and best practices governing controller information overload are first and foremost designed to ensure that controllers do not miss potential leak detection due to being inundated with too much additional information. However, it is also important to ensure that controllers do not miss conditions and alarms that indicate a commodity release that is about to occur. New human machine interface (HMI) design best practices have been built into the newest SCADA systems to ensure the operator can efficiently access the most critical information. The newest alarm management systems allow for highly customisable alarm hierarchies that also help operators ensure their controllers are able to achieve both goals of rapid detection and maximising prevention.

This is an excellent example of where prevention can be done both through periodic check-ups, but also through similar real-time monitoring strategies used for detection. SCADA alarms can be set up in a hierarchy that differentiates alarms signifying a likely product release from conditions likely to lead to a leak. Every pipeline has what is called a Maximum Allowable Operating Pressure (MAOP), sometimes converted to a Maximum Allowable Operating Head (MAOH) for liquid pipelines. Operators with SCADA infrastructure with real-time transient models that calculate the pressure or head at any point in the pipeline can set alarms for any transient exceeding MAOP/MAOH, signaling a potential stress point location for a commodity release.

Working with the general public to prevent commodity releases is another good example of prevention strategies. When looking at the causes of commodity releases, many are associated with what is called mechanical damage, or, in other



*It is important to ensure controllers do not miss conditions and alarms that indicate a commodity release*

words, somebody digging close to, or tampering with, the pipeline. Newer intrusion detection technology has made it easier to detect if unsafe activity like digging is occurring near pipelines, or if a theft is being attempted, one of the primary causes of leaks in several countries.

Regulators, operators and vendors need to continue to invest heavily in detection and mitigation strategies, as leaks will continue to happen whatever their prevention efforts. However, having an Integrity Management Programme (IMP) in place that incorporates real-time preventative strategies is essential in taking a proactive approach to safety.

Consistently adapting the IMP to meet new challenges and incorporate new best practices is essential, and many of the maintenance and real-time preventative tools



Many causes of commodity releases are associated with mechanical damage (Photo: Jeff Kramer)

“Regulators, operators and vendors need to continue to invest heavily in detection and mitigation strategies”

can be very economical for the pipeline company, both from the perspective of low-implementation costs, but, most

importantly, preventing costly impacts to pipeline operation and public and environmental safety. ■



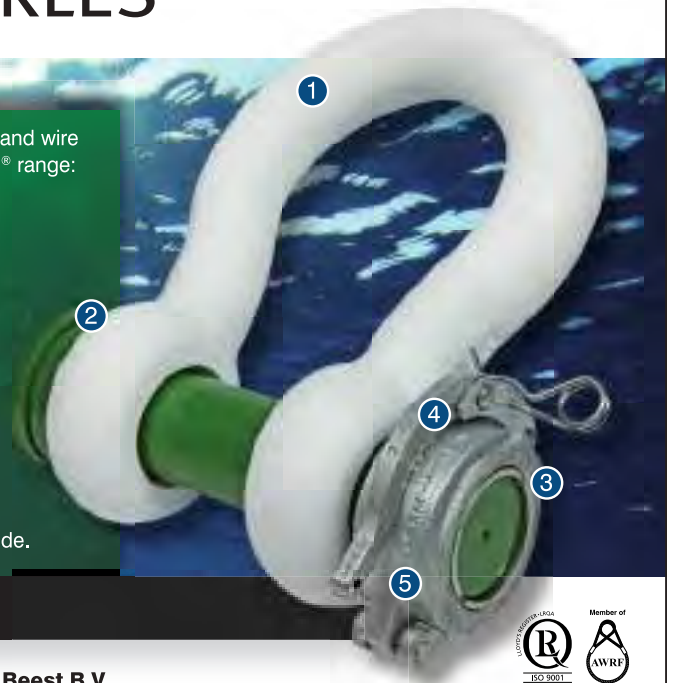
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# Quantifying gross rock volume uncertainty

Samir Walia, senior geoscientist at Emerson Process Management, discusses how the company's new reservoir modelling workflow has assisted a major Middle East operator in field appraisals.

**W**ITH OIL PRICES and average global oil and gas recovery rates currently so low, the accurate early appraisal and development of reservoirs are more important than ever. An essential way of ensuring oil and gas fields are economically viable – increasing future production and extending their lifetimes – is through 3D reservoir modelling that is able to map, understand and predict reservoir behaviour. The reservoir modeller's ability to build a realistic representation of the reservoir geometry is vital for accurately representing fluid flow and volumes and providing input into future field development programmes.

Key to developing accurate reservoir models and helping guide the early appraisal and development of the reservoir is the calculation of gross rock volume (GRV) uncertainty. This is one of the most significant uncertainties, especially in the early phases of development of the reservoir, with the correct handling of structure and contacts often the key to realistic uncertainty assessment.

“Key to developing accurate reservoir models is the calculation of gross rock volume uncertainty”

Abu Dhabi Marine Operating Company (ADMA-OPCO) used a new reservoir modelling workflow model from Emerson on a field in the appraisal/early development stage. This enabled ADMA-OPCO to integrate geophysical and geological data to generate a multi-realisation 3D uncertainty structural model. Such a model quantifies GRV uncertainty and plays a key role in reducing risk and improving drilling and reservoir management decisions.

The reservoir, which is owned by Abu Dhabi National Oil Company (ADNOC), has nine wells unevenly distributed across the

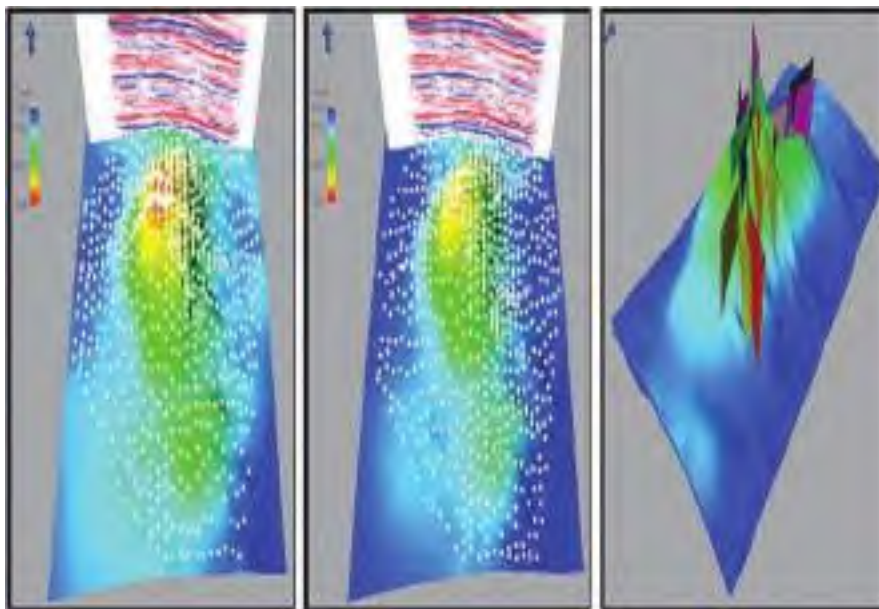


Figure 1: The control points used for the two surfaces

field, not all of which have penetrated the bottom of the reservoir. The quality of the seismic data is only fair, with limited well and seismic data and limited confidence in the velocity model. Against this background, there was a need to quantify uncertainty within the reservoir model and, in particular, calculate GRV uncertainty.

## Conventional vs alternative workflows

The conventional workflow for quantifying uncertainty in the reservoir model consists of importing seismic surfaces and faults, developing a reference structural model and then a full field structural model through the integration of subsurface data, building a 3D grid, and then running multiple realisations to calculate uncertainties.

This results in P10, P50 and P90 volumetric calculations that determine the probabilities of the reserves. With the conventional approach, uncertainty is quantified using a simple scalar option (for

example -15 to +15) where the surface points (high, base and low) are either positioned up or down. In addition, faults are kept constant in all realisations, and the constant uncertainty ranges have a corresponding impact on the standard deviation maps.

There are weaknesses to this approach, however. There is little flexibility in being able to react to the different data elements in the model (surface points must either be positioned up or down) and there is no clearly defined approach for setting the uncertainty parameters in the structural model that will vary from interpreter to interpreter. The conventional interpretation process is also geared towards producing just a single model or scenario for the configuration of subsurface geobodies, despite the data being able to support many different interpretations.

Therefore, there is a need to increase operator confidence in GRV uncertainty calculations through a more complete





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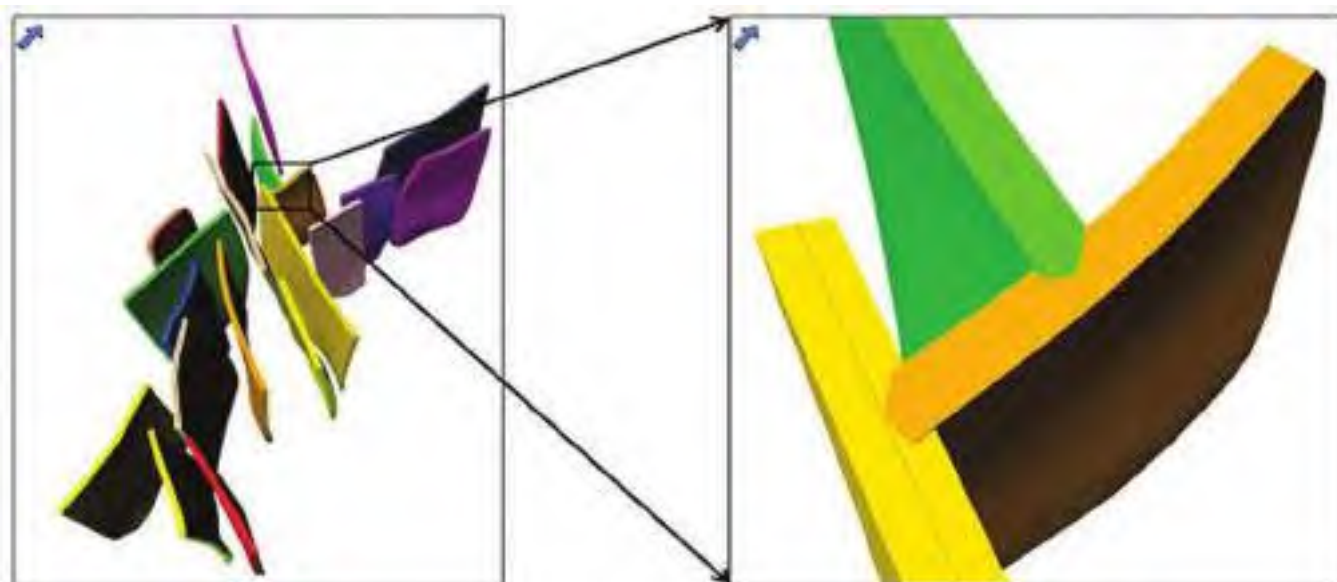


Figure 2: The fault uncertainty envelopes

representation of the seismic data, where the uncertainty is guided by the data, and where the capturing of uncertainty can take place for each single point during the interpretation process.

### Model-driven interpretation

The advanced workflow used here is based on the latest version of Emerson's reservoir modelling software, Roxar RMS 2013. This software comes with model-driven interpretation capabilities that enable users to not only create the geological model while conducting seismic interpretation, but also capture uncertainty during the interpretation process.

Once the seismic surfaces and faults have been imported or interpreted, the new workflow enables the interpreter to define structural uncertainties based on the seismic interpretation results and create standard deviation surfaces and fault envelopes. Then, one can create a reference structural model and full field structural model based on the interpreter's requirements.

Rather than focusing on a single horizon or fault, in Emerson's new model-driven interpretation workflow, uncertainties are represented by envelopes that change size based on the interpreter's estimate of uncertainties on each interpreted location.

The interpretation method measures

both a best-estimate interpretation of a geologic feature and an associated uncertainty. As compared to the conventional workflow, where uncertainty can only be moved vertically by the constant factor, in the new workflow for each point, uncertainty is guided by the data.

“In the new workflow, uncertainty is guided by the data”

Following the model-driven interpretation process, a standard deviation map is then extracted, which is also used to capture the uncertainty prior to the building of a structural model and is then taken through the remaining elements of the workflow to create multiple realisations.

### Capturing uncertainty

On this field, Emerson introduced its new advanced RMS 2013 workflow that allows ADMA-OPCO's geomodellers to define lateral and vertical uncertainty at every pick based on the seismic interpretation workflow alongside velocity models and fluid contacts. This approach enables users to define uncertainties at all stages of the workflow from seismic interpretation through to structural modelling.

Figure 1 (see page 48), for example, illustrates the control points that were used for the two surfaces – the upper surface control points, the lower surface control points, and the base case surfaces with the fault network. In all these illustrations, each point represents a best estimate coordinate with different uncertainty ranges then applied

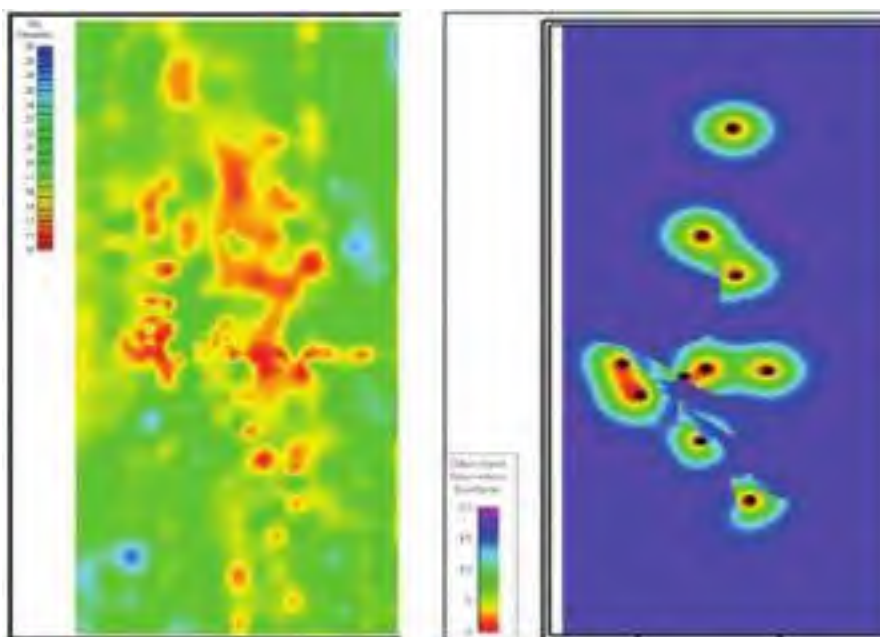


Figure 3: Standard deviation maps generated from the conventional (left) and advanced (right) workflows



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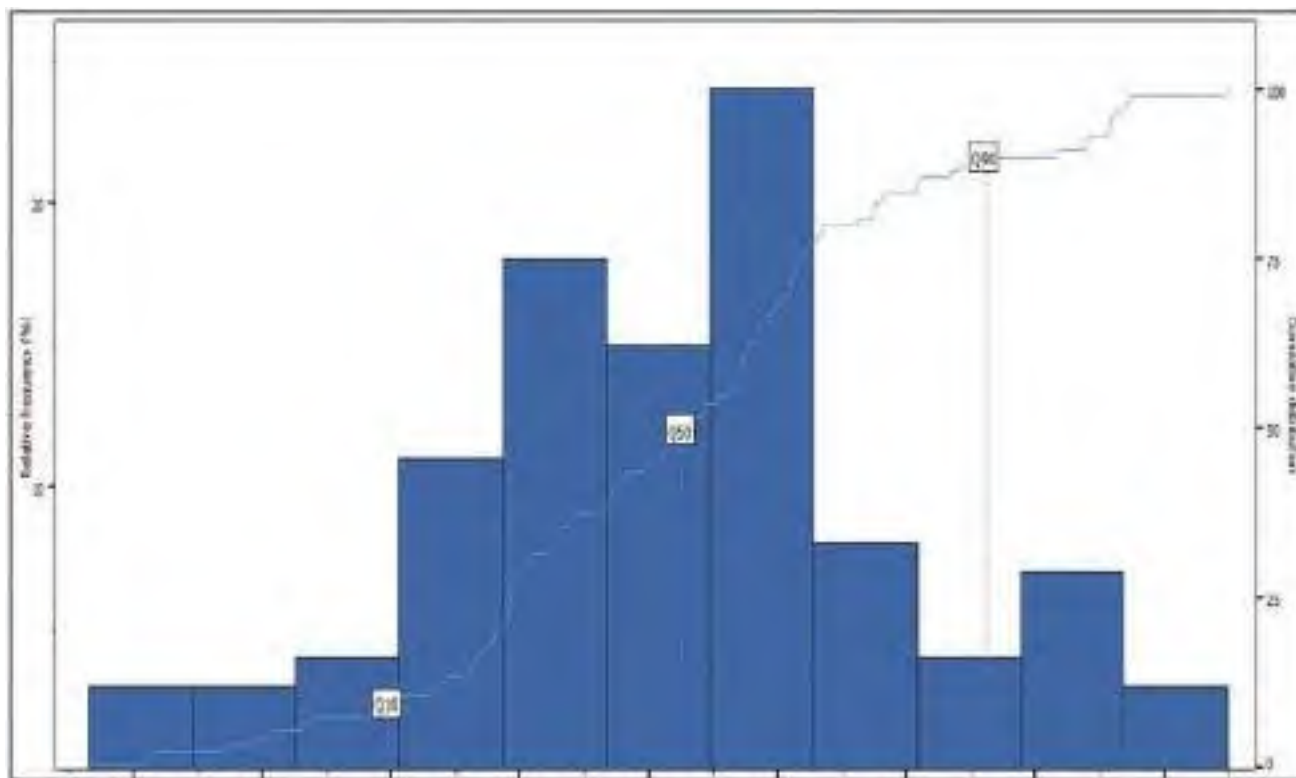
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**Figure 4: Multiple realisations and gross rock volume**

for each point. This uncertainty may be high or low, with nearer the well lower uncertainty, and away from the well higher uncertainty based on the quality of the seismic.

Figure 2 (see page 50) illustrates the fault uncertainty envelopes. The uncertainty along the faults can be provided during interpretation for each point or can be kept constant and defined manually on both the hanging wall and the footwall side during the structural modelling workflow.

### Standard deviation maps

The standard deviation maps generated through the advanced workflow to address the uncertainties at every interpreted point varied significantly compared to the conventional workflow.

In Figure 3 (see page 50), the map on the left shows the standard deviation map generated from the conventional uncertainty workflow, and the figure on the right is from the new advanced workflow. The standard deviation map generated through the advanced workflow reflects confidence in the quality of the seismic data rather than the constant uncertainty ranges inputted by the interpreter. The red shades indicate where the uncertainty is low, and the green where the uncertainty is high.

The same figure also illustrates the change in position of faults and surfaces for different realisations that cannot be done through the conventional method.

Based on the geological knowledge of

“ It is becoming increasingly important to generate more accurate models ”

the reservoir and seismic signal quality, the ranges of fault parameters such as lateral position, dip, strike and throw can now also be incorporated within a defined range to run multiple realisations. The standard deviation has also been used to generate the multiple structural models using multiple realisations. All the results are confined within the defined uncertainty envelope.

### The results: GRV ranges

The next stage of the workflow was the creation of a 3D grid. The grid size was 200 by 200 with 214 rows, 191 columns, 20 layers and a corner point gridding format along with pillar gridding for the faults.

It is through the grid that multiple realisations were generated and eventually GRV ranges (see Figure 4). This generates the P10, P50 and P90 GRV values as well as indicating which horizons, velocity models or fluid contacts are affecting the GRV calculation.

With the conventional workflow, uncertainty is very low along the wells, but as you go out from the well, the uncertainty range is higher before tending to become

the same everywhere. With the new workflow, the uncertainty may be lower in other areas, depending on data quality and not just based on well control. This is reflected in the model giving the interpreter better control over the standard deviation maps and the uncertainty envelope and a more accurate distribution of the GRV.

### Conclusions

The case study described in this article illustrates the benefits of GRV uncertainty quantification through Emerson's new model-driven interpretation workflow.

As opposed to the conventional workflow where uncertainty is quantified using a simple scalar option, the new workflow allows uncertainty to be guided by the quality of the seismic data. Fault positions are changed for each realisation and the standard deviation maps reflect the confidence level of seismic data quality. In short, interpreters are given the flexibility to follow the data and honour the geology.

The results for ADMA-OPCO will be improved GRV uncertainty, valuable input into field appraisal and development plans, and reduced risk.

As geological settings become more complex and operators look for greater investment returns from their fields against a background of lower prices, it is becoming increasingly important for them to generate more accurate models and therefore be better able to quantify geologic risk. ■



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## Satisfying the demand for on-site power 24/7

The genset is the beating heart of any oil or gas installation. A conventional diesel-fuelled combination is the standard against which the rest are compared.

**U**NDER CONSTRUCTION OR in commercial production, no energy facilities can function without an adequate source of on-site power, available 24/7. The properly-sized and appropriately-rated diesel generating set is by far the most reliable way of providing this.

A typical mid-range set rated at 100kVA produces the standard 415V at around 110A. This is achieved by means of a 6-7 litre turbocharged diesel rotating at 1500 rpm or more, which will have to be supplied with at least 25 litres of fuel per hour. High-capacity gas-turbine systems, often installed to provide combined heat and power whenever demand is high enough and a suitable source of associated gas is available to drive them, are beyond the scope of this article. However, we discuss separately low-cost mobile gensets that are so popular with boat operators and construction contractors; these usually run on volatile gasoline which is a fuel most rig operators are keen to avoid (see box).

Consisting of a fuel tank, heavily built reciprocating prime mover, tailored exhaust and cooling systems, with a matched alternator and various ancillaries, including a control system and sound-attenuating canopy, such as three-phase 50 Hz or 60 Hz equipment are widely available in sizes up to 2500kVA. These systems are often designed to fit neatly into a standard shipping container. Install a matching and synchronised bank of these and, effectively, a standalone power

station capable of operating in 'island' mode has been created. But it is important to specify whether continuous (primary) or standby power is needed.

### To rent or buy?

The expected duty cycle and power demand must be planned for from the outset as well as the typical range of atmospheric conditions that will be experienced. A key decision that has to be made is whether to rent or to buy, both sectors of the genset supply trade being well represented in the Gulf. Several provide user-friendly software, including online tools and apps, for making this far-reaching decision. Specifiers must also be clear about whether a permanent attachment to the grid is eventually to be made, another matter which requires advice.

Gensets have to provide the required power consistently and without self-harm, according to the rating and potential applications designated by the manufacturer. In occasional-use mode an overload factor, typically 10 per cent is often stated as well.

The rating specifications that should be checked out when selecting include primary operation (unlimited running hours) with a load variable within specified limits, including a short-term overload limit. These sets can safely be used on any production rig or vessel once up and running; they are generally not suitable for use during the construction/installation phase. They can be combined with equipment rated for continuous-load use for peak shaving purposes (eg, start-up of multiple pumps or drilling mechanisms), as long as all alternators involved are synchronised.

“A key decision that has to be made is whether to rent or to buy”

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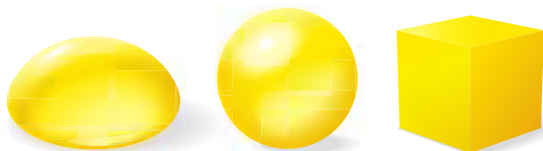


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The base-load operation rating relates to the supply of power on a continuous basis against a constant load, no sustained overload capability having been built in.

The standby rating is based on equipment suited to the supply of emergency power on a temporary basis, typically after a normal grid or primary-system failure. No sustained overload capability applies.

Thus a single set might be rated by the manufacturer as 800kVA for continuous use, 1000 kVA for standby application, with an intermediate prime power rating of just 850 kVA. All equipment should be supplied with a data sheet/manual or affixed plate specifying these limits. These usage definitions are detailed within the genset category of all international standards systems such as ISO and DIN.

Through their local agents, all diesel-set suppliers provide detailed instructions and supervision for the all-important installation process of brand-new equipment, whether the set is large or small. Ignore these and both maintenance and depreciation costs can rise alarmingly, along with the lifetime cost of power supplied.

Guidelines supplied to the potential customer cover such matters as equipment selection, electrical considerations like peak (eg, motor starting) and steady-running loads, cooling and combustion air requirements, how to store fuel safely, dealing with noise and nuisance hazards, exhaust-system design and performance, starting arrangements and information about the built-in hard- and software for system control. ■

Low-cost mobile gensets

MOST CONSTRUCTION CONTRACTORS include a small gasoline-fuelled engine generator among the equipment stored on the vehicles they use daily. Usually rated at less than 4kVA, these compact and mobile machines, either two- or four stroke, are handy for various routine tasks such as trench de-watering, powering hand-held tools and emergency lighting. They are invaluable as an instant source of power on any kind of production platform or rig, as long as the fuel can be stored safely.

With very low purchase costs, their maintenance requirements tend to get overlooked, resulting in failure when they are most needed. Investing in a well-known brand always makes sense.

The maintenance programme is much the same as for any small internal-combustion powered vehicle; independent roadside workshops often specialise in 'small engine care' – just an hour's work perhaps twice a year. Choose one displaying the right manufacturer logos; that way you will know that OEM-approved replaceables such as spark plugs and filters will be fitted – and lubricants of the right grade and quality, of course.

The key requirement with all small engines that do not rely on compression for ignition is to make sure the electrics are kept in top (and dry) order. Check regularly that all connections are clean, bright and tight, with no fraying of or dirt accumulation on the insulated leads. If a battery is fitted for starting, make sure the electrolyte levels are correctly maintained. Start the set-up at least once a week and run it until the operating temperature has been reached (but not exceeded; the cleanliness of a forced-air cooling system is important). Fitting a new plug with a tight HT lead is one of the best ways of improving starting performance. And if the machine has not been used for a long time, a tank of fresh moisture-free fuel can work wonders.

Very small engine generators often have to function in dusty conditions, so the cleanliness of air, fuel and lubricant filters is critical. A stock of spares should be included in the tool kit which travels with the machine.

And, needless to say, small generating sets with tiny sump capacities only last beyond the end of the week if the engine lubricant level is checked every single day.



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# High temperature linings for sulfur storage tanks

Anna Michael and Juan Lopez Galera, Belzona Polymerics Limited, discuss the company's solutions to prevent wet sulfur corrosion in storage tanks.

**M**OLTEN SULFUR IS present in an ever widening range of industries, and liquid sulfur storage tanks are used worldwide in crude oil refineries and natural gas plants to store liquid sulfur in very large volumes. Sulfur storage tanks are most commonly utilised as part of the Gas Treating System in sour crude oil refineries and gas sweetening facilities, to temporarily store liquid sulfur produced in the sulfur recovery plant. These tanks are usually field erected and most commonly constructed of carbon steel.

Even though in recent years there has been significant progress with regards to the mechanical design of sulfur storage tanks, they are still plagued with corrosion issues, and internal corrosion is considered to be the main threat to longevity and safety. Unlike external corrosion that can be easily identified, internal corrosion is out of sight and can therefore go unnoticed, with catastrophic consequences. As a result of internal corrosion, sulfur storage tank service life has been reported to be as low as five years, while general storage tanks demonstrate a life of 30 years.

Sulfur storage tank failures can not only lead to loss of revenue and increased costs through downtime and replacement, but can also have a critical human health and environmental impact. Due to the combustible and toxic nature of sulfur, leaking sulfur tanks can be a significant source of environmental pollution to soil, groundwater, streams and lakes, resulting in contamination of drinking water. In addition, fire, explosion and inhalation of dangerous vapours present further critical concerns. Such scenarios may result in asset owners

“Internal corrosion is out of sight and can therefore go unnoticed, with catastrophic consequences”



**Sulfur storage tanks are plagued with corrosion issues**

facing strict financial penalties from environmental regulatory institutions and, as a result, damage to their reputation on a local and international level.

## Highly corrosive environment

Corrosion mechanisms vary according to the design and service conditions, but the most common cause for internal corrosion is the deposition of solid sulfur on the interior surfaces of the tank together with the presence of liquid water. The combination of these two components creates the phenomenon of wet sulfur corrosion that can severely attack the carbon steel, especially when the hydrogen sulfide (H<sub>2</sub>S) concentration levels are high.

In order to keep the sulfur in a liquid state, the storage tanks are heated at a temperature between 257°F (125°C) and 293°F (145°C). Insufficient heating and external climatic conditions, in combination with missing insulation, will cause temperature variations within the tank. Failure to maintain the desired temperature at the steel surfaces in the vapour space of

the tank will lead to the solidification of the sulfur fog. The concentration of solid sulfur at the interior side walls, the roof and the vent nozzles will then cause severe corrosion that will propagate in depth and length.

After solidifying on the surface, the sulfur will act as an insulator contributing to further cooling of the surfaces. As the temperature continues to fall, traces of condensed water, formed by oxidation of hydrogen sulfide, will react with the solid sulfur and the iron from the tank walls, creating the ideal environment for the formation of iron oxide (Fe<sub>2</sub>O<sub>3</sub>) and iron sulfide (FeS) that further accelerate corrosion.

When the tank is in an anaerobic condition, the iron sulfide will not cause any hazards. However, when the tanks are opened to the atmosphere for inspection, cleanout and maintenance, the iron sulfide, being a pyrophoric material, can spontaneously combust in the presence of oxygen, igniting a sulfur fire or an explosion.

Despite there being fabrication codes for the construction of this type of tank, these

codes do not include sufficient mitigation for corrosion formation. Therefore, sulfur tank corrosion problems remain unsolved and corrosion control and mitigation measures are left with the operator of the tank.

### High temperature protective linings

Field experience has shown that corrosion mechanisms and conditions can be minimised or eliminated by employing protective internal linings. To ensure a successful outcome, the protective materials should demonstrate outstanding chemical resistance against direct exposure to acidic conditions at high temperatures.

The first step of Belzona's high temperature lining research project was the introduction of hand applied Belzona 1591 (Ceramic XHT) in 1998, and spray applied Belzona 1521 (HTS1) in 1999, following a successful field trial programme. Over the following 16 years, Belzona's R&D department analysed data from the field and researched innovative technologies and filler systems that could enhance material characteristics and in-service performance that would allow the coating to resist elevated temperatures, but, at the same time, remain flexible to sufficiently minimise the risk of cracking. This research culminated in the introduction of next-generation, high-temperature vessel linings in March 2014 – hand applied Belzona 1593 and spray applied Belzona 1523.

### Enhanced chemical performance and increased flexibility

Belzona 1523 and Belzona 1593 epoxy linings are designed to provide long-term corrosion and chemical resistance to equipment operating in continuous immersion at temperatures up to 140°C and 160°C, respectively. These two-part materials consist of an epoxy novolac base and a polyamine solidifier that, when mixed and cured, produce a very tightly cross-linked density.

The lining's network is additionally supplemented by a novel secondary cross-linking mechanism initiated at temperatures above 90°C that further increases the cross-link density of the polymer matrix, making it even more difficult for the attacking reactive molecules to permeate through the film. Consequently, the materials demonstrate excellent resistance to liquid sulfur, sulfur dioxide (SO<sub>2</sub>) and hydrogen sulfide (H<sub>2</sub>S), as well as to the small amount of sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) that may be present in a sulfur storage tank.

The high cross-link density required for coatings to achieve their high temperature immersion resistance can make conventional materials rigid and susceptible to cracking during thermal cycling and

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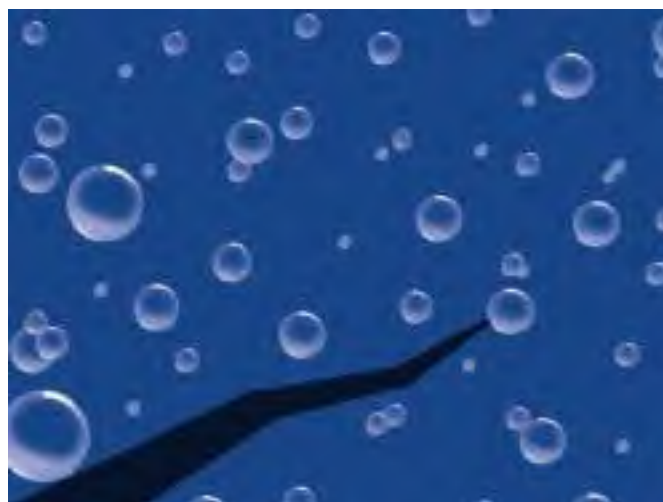
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**Crack propagation on conventional lining materials**



**Belzona 1523 and Belzona 1593 incorporate rubbery domains which inhibit crack propagation**

substrate flexing. Belzona 1523 and Belzona 1593 overcome this by the incorporation of rubbery domains that offer flexibility and inhibit crack propagation.

Belzona 1523 and Belzona 1593 demonstrate excellent adhesion. Belzona 1523 exhibits a tensile strength of 13.7 MPa and elongation rate of 0.54 per cent when cured and tested at 100°C, whilst Belzona 1593 exhibits a tensile strength of 11.2 MPa and elongation rate of 0.31 per cent when cured and tested at 160°C. Since the materials can be deformed when under radial, circumferential and longitudinal stress, they preserve their integrity, move in sympathy with the substrate, reducing material ruptures, breaks and fissures.

During the application of solvent-based coatings, issues can arise due to solvent retention within the film. In this case, solvent can be trapped within the applied linings and eventually evaporate leaving

behind a void, which can then be filled by the system fluids, causing bubbling and blistering. This is not the case with Belzona 1523 and Belzona 1593 since they are solvent free and are therefore also environmentally friendly.

### Application methodology and inspection

These next-generation linings address an application issue previously experienced when applying a two-coat system of high temperature linings – bypass the need for grit blasting between coats, provided the second coat is applied within a 24-hour overcoat window. In addition, the unique curing mechanism of Belzona 1523 and Belzona 1593 activated at ambient temperatures eliminates the need for separate post curing processes as the lining will post cure in service, ensuring a faster turnaround.

High viscosity coatings are often over applied in an attempt to make the application easier and to improve the flow out, which can lead to over-thickness, and have a large impact on costs and, more importantly, on performance. Improved rheology in this case allows for a more uniform thickness to be achieved.

“An important consideration for lining manufacturers is visual inspection during application”

An important consideration for lining manufacturers is visual inspection during application. Dark coloured linings can make it very challenging due to poor lighting inside the vessel.

Next generation linings have been formulated in light contrasting colours enabling quicker and more precise identification of potential problems at the application stage. They are also spark testable and with minimal bloom formation on the surface, eliminating false alarms due to surface tracking.

### Other applications

As a response to existing needs and anticipating the future demands of the sulfur storage tanks market, Belzona has introduced its new technologically advanced high temperature linings to minimise corrosion failures and ensure personnel protection. Belzona 1523 and Belzona 1593, are based on advanced polymer technology that is also ideal for use in other oil and gas production equipment vessels such as separators, flare knock-out drums and evaporators operating at high temperatures. ■



**Belzona 1523 spray-applied**



**Complete application of Belzona spray-applied lining**



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**OMC 2015**

Date: 25-27 March 2015

Venue: Ravenna, Italy

**OMC  
2015** OFFSHORE  
MEDITERRANEAN  
CONFERENCE  
& EXHIBITION

# Providing a forum for the offshore oil industry

This year's Offshore Mediterranean Conference and Exhibition promises a wealth of technical know-how and opportunities for the offshore community.

**T**HE 12TH OFFSHORE Mediterranean Conference and Exhibition (OMC) to be held from 25-27 March in Ravenna, Italy, will provide a platform for the offshore community to come together and discuss key areas of research and development, technology achievements and future challenges facing the energy industry. More than 670 exhibitors from Europe, North Africa, Middle East, Far East and North America have confirmed their presence in addition to five national pavilions from China, the Netherlands, France, Egypt and the USA. Exhibiting companies include Eni, Sonatrach, NOC Libya, EGPC, EGAS, Qatar Petroleum, Edison, Shell, Total, Halliburton, Aker and Weatherford.

'Focus on Change: Planning the next 20 years. Diversifying Choices, Increasing Opportunities' is the theme of the plenary session, chaired by Eni CEO Claudio Descalzi. Highlights of the 32 technical sessions include a workshop on Enhanced Oil Recovery (EOR) and a session entitled 'Five Years after Macondo', which will address the normative, legal and technological aspects of offshore activities.

Other topics covered include seismics and exploration; offshore and deepwater; reservoir characterisation; well construction and management; flow assurance; environmental protection in offshore operations; drilling: new technologies; safety and environmental protection in offshore operations; production optimisation; enhanced oil recovery; opportunities in exploration; energy efficiency; subsea production; reservoir monitoring and simulation; sustainability; facilities and their life cycle; and geohazards.



*The busy exhibition floor at the 2013 event*

## Focus on youth

OMC is also committed to young people. The Youth Programme on 26 March will include a "Five minute speech contest" with prizes awarded to the best three presentations made to an audience of professionals.

OMC was launched in 1993 as a regional event in Italy, but has gone on to achieved international status. This biennial event has focused on disseminating offshore science and technical knowledge, promoting and supporting education for engineers and technicians and advancing the development of tools and procedures required to explore, tudy, and further the

responsible and sustainable use of the Mediterranean's energy resources. Among the participants expected are engineers, scientists, policy makers, educators, industry leaders and students.

OMC will provide a forum for companies not only to present their products and services, but to meet potential partners and establish technological and / or business cooperation. It will also offer participants a rich cultural and social programme at the end of the working day. ■

*For further information see the website at [www.omc2015.it](http://www.omc2015.it)*

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**SOGAT 2015**

Date: 22-26 March 2015

Venue: Abu Dhabi, UAE



# Efficient management of sour hydrocarbons

**T**HE 11TH EDITION of Sour Oil and Gas Advanced Technology (SOGAT) will bring together vendors, suppliers, engineers, researchers, system experts, representatives of NOCs, IOCs and service and contracting companies, who will participate in a series of seminars, conferences and technical workshops.

According to BP's *Statistical Review of World Energy*, there are nearly 1,496.2 tcf of natural gas in the MENA region. Some of these reserves of gas are hard to find, and some even harder to extract,

widening the gap between demand and supply. While Algeria, Oman, Saudi Arabia and Libya are focusing on shale gas exploration, the UAE has opted to develop sour gas reserves. Leading projects include the Bab Sour Gas project in Abu Dhabi, jointly carried out by Shell and Abu Dhabi National Oil Company (ADNOC). The Abu Dhabi Gas Development Company (Al Hosn Gas) is developing the US\$10bn Shah gas field, which is expected to produce 14.1mn cu/m of gas daily and is believed to be one of the biggest sour gas extraction projects in the world. Technical assessment of the Hail and Shuweihat fields is also in progress. Other regional projects include the Harweel Cluster and Mabrouk fields in Oman, the Khurais field expansion in Saudi Arabia and the US\$10.3bn Zarzan Gas project in Qatar.

While the availability of sour gas opens a range of possibilities in the country, the methods of extraction are changing everyday and are considered complex, expensive and time-consuming. Industry experts have said that mega projects such as Bab and Shah will require a combination of various methods, approaches and technologies to ensure optimal gas extraction. At SOGAT 2015, these technologies will be discussed in detail. Workshops will be held on gas compressors, amine treating, sour gas treating and simulation proficiency, gas feed and inlet contamination management and Fluor/Devco sour gas project development.

Technical conferences will feature industry leaders, who will focus on a range of technologies such as sulphur recovery, electro dialysis technology, SO<sub>2</sub> emission reduction, SRU overpressure scenarios, acid gas removal and gas processing. Exhibiting companies include Al Hosn Gas, Dow Oil and Gas, Fluor, Luma Sense Technologies, Sandvik and BASF among others. Organisers want to ensure a varied exhibitor profile to allow interested parties to view and discuss the latest developments in sour gas extraction. ■

***Sour gas extraction methods are constantly evolving***



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## Experts set to gather for big data event in Abu Dhabi

TECHNOLOGY LEADERS FROM oil and gas companies including ADNOC, Shell, Total and Halliburton are gathering for the Big Data Analytics for Oil & Gas conference, scheduled to take place from 19-21 April at the Al Raha Beach Hotel in Abu Dhabi. Presentations and discussions will take place on key technologies and applications which will help companies establish more efficient oil and gas production, reduce costs and risks, improve safety and lead to overall better decision making.

Oil and gas companies need to

understand what big data is, what applications are possible, what return on investment (ROI) they can expect and what technology upgrades will be needed.

This event will provide a platform for technology and business professionals in the oil and gas sector to come together and share best practice knowledge, gain insights from each other and take away useful information to deliver their big data strategy.

Keynote presentations will be made by Awad El Sidiq, Senior Database Administrator, ADNOC Distribution, talking

about how organisations can make the transition from a legacy system to a future-proofed IT platform; and Dr. Satyam Priyadarshy, Chief Data Scientist, Halliburton will present a talk on the return on innovation when investing in big data.

### Gain insights from industry experts on how you can:

- Use big data analysis to increase oil and gas production output
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- Develop easy to use, secure, scalable information management and analytics platforms
- Create real and actual value from analysing raw data

For further information visit [www.oilandgasbigdata.com](http://www.oilandgasbigdata.com)



The event will be held at the Al Raha Beach Hotel

## Erbil event to highlight opportunities in Kurdistan Region of Iraq's oil and gas sector

THE FOURTH ERBIL International Oil & Gas Exhibition will take place in Erbil, Iraq, on 22-25 April 2015. The event, which is organised by the Pyramids Group, will be held at the Erbil International Fair Ground and is one of the largest energy-related events in Iraq.

The Third Erbil Oil & Gas Exhibition, which took place in September 2013, attracted 50 exhibitors and more than 5,000 government associates, engineers and decision makers from national oil companies, along with professionals and experts from the construction sector, engineering construction and contracting services, financial services sector, project consultancy, repair services, trade associations, transportation, and storage and handling industry.

For both regional and international companies, the exhibition will provide a platform to assess the products and technologies available in Iraq and throughout the Kurdistan Region of Iraq.

With approximately 45bn barrels of oil and 60 trillion cubic feet of gas with low geological exploration risk, the Kurdistan Region of Iraq, of which Erbil is the regional capital, has distinguished itself as a key oil and gas source in the region, promising further positive momentum in the years to come. The Kurdistan Regional Government has ambitious plans in place to increase production to one million bpd, which would also require an increase in the region's pipeline capacity.

Among the exhibitors expected to attend the event will be a broad mixture of service companies, technology providers and consultancies from across the oil and gas industry. Companies focused on LNG, geophysics and geology, exploration and production, drilling and well servicing and refining, processing and petrochemicals will be mixing with oilfield equipment firms, onsite construction companies and security service providers. There will also be a focus on recruiting, training and human resource services.



The Fourth Erbil International Oil & Gas Exhibition will take place on 22-25 April 2015 (Photo: Arne Hückelheim)

The event itself will look to provide a unique platform to both exhibitors and visitors, offering a range of demonstrations of the latest products and services available within the industry, while international and local industry professionals will also be given the opportunity to network with officials from state-owned companies and government ministries.

To find out more about the Erbil International Oil & Gas Exhibition, visit <http://www.erbiloilgas.com/>

**WEPower**

Date: 14-15 April 2015

Venue: Dammam, Saudi Arabia

The 11th Saudi International

**2015**  
**WEPOWER**  
 Water, Electricity & Power Generation Forum

# WEPower to bring global power industry to Dammam

**T**HE RETURN OF WEPower, set to take place in Dammam in April 2015, is this year celebrating its 11th edition and will bring together local and international suppliers and technology providers to discuss major water and power projects in Saudi Arabia.

Held at Dhahran International Exhibitions Centre, the forum will also deliver a strategic conference alongside a global exhibition, with international public and private organisations set to meet to address the kingdom's huge growth in demand for water, electricity and power.

Known primarily on the international stage for its extensive oil and gas reserves, Saudi Arabia is investing heavily in its energy and water infrastructure as it looks to move its hydrocarbon resources away from domestic consumption in order to increase oil and gas exports.

According to WEPower organisers BME Global, electricity use in Saudi Arabia is increasing at a rate of about 7.5 per cent annually, and the country is planning to invest US\$26bn in 76 renewable energy projects across the country.

The state-run Saudi Saline Water Conversion Corporation (SWCC) has plans in place to invest US\$80bn by 2025 on boosting energy-intensive desalinated water production to 8.5 million cubic metres a day, and is also attempting to double energy efficiency from its current level of about 26-27 per cent to 54-55 per cent.

**New for 2015**

Among the new features for 2015 available to exhibitors and delegates will be a speaking slot for exhibitors booking an exhibition space above 36 sqm, a delegate place for exhibitors booking an exhibition space over 18 sqm, and site tours for selected VIPs and guests.



**WEPower 2014 attracted expert speakers, exhibitors and visitors from across the global energy and water industry (Photo: BME Global Ltd.)**

There will also be a new presentation theatre in which exhibitors will be able to showcase their products and services, as well as a brand new exhibition layout.

Visitors to WEPower 2015 will be able to find out more information on the country's plans to generate a third of its electricity supply by 2032 via renewable and nuclear energy sources. Opportunities are also extensive within the transformers market, which is set to grow at a compound annual

growth rate (CAGR) of 24 per cent up until 2018. Investment in natural gas-related projects in kingdom currently stands at approximately US\$50bn and with subsidies for water, electricity and gasoline currently costing the government SAR135bn (US\$35.9bn) annually, there will be a host of opportunities for service and technology providers at the event, along with all the latest information for engineers, business development professionals and general managers working within the power and water industry.

A large percentage of visitors will include the key decision makers from a range of companies within the sector, with international visitors from across the world also in attendance. ■

To find out more about WEPower, visit: [www.wepower-sa.com](http://www.wepower-sa.com)

“ Electricity use in Saudi Arabia is increasing at a rate of about 7.5 per cent annually ”

## Arab Oil & Gas

Date: 21-23 April 2015

Venue: Dubai, UAE

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# Energy and hydrocarbons for a better tomorrow

The organisers of Arab Oil & Gas (OGS) discuss the significance of conducting the show alongside WETEX, the growing synergy between hydrocarbons and energy, and the inclusion of UAE nationals into the country's oil and gas sector.

**Q:** This year's OGS is being held alongside WETEX. Can you tell us why and the significance of this?

**A.** The co-location of OGS and the Water, Energy, Technology and Environment Exhibition (WETEX) provides access to invaluable technical information and offers networking opportunities with local, regional and international trade buyers as well as industry specialists. The holistic approach towards energy covers the OGS and WETEX exhibition profiles, with exhibits catering to all aspects of energy production and service.

**Q:** How has the current price of oil affected regional project developments?

**A.** We believe the recent dip in oil price is a temporary phenomenon that will ride out over time. Given stable energy production costs in the region, the current oil prices will not affect the growth and investment plans of GCC states. Thanks to a healthy combination of oil and gas reserves and the large currency reserves the GCC has built up in recent years, the region should not be affected by the drop in oil prices, and will continue to pursue economic development projects.

**Q:** How closely related are the energy and oil sectors today? Why is the emphasis more on the synergy now?

**A.** The energy and oil sectors are closely integrated. There is a consolidated outlook at both federal and state levels. This synergy has spawned efforts to develop new productive energies that can help meet global demand and sustain economies around the world. These efforts ensure demand continuity for the world energy markets and offer hope in creating a balance on environmental issues.



**The UAE is rich in sour gas reserves, and is favoured by investors due to its social and political stability**

**Q:** How will OGS further the cause and what kind of exhibitors can we expect?

**A.** The combination of WETEX and OGS acts as a strategic platform to increase awareness of the efforts to reinforce the synergy between hydrocarbons, gas and energy in its entirety, encouraging entities that conduct research and develop production technology to showcase their findings on new productive energies.

There will be many exhibitors specialising in specific areas within the industry from the Gulf states, the wider Middle East, Central Asia, Africa, Asia-Pacific and other key regions, in an effort to create a platform where influencers can engage and exchange industry news and trends.

Midstream and downstream exhibits will include products and services related to surveying, installation, drilling, research and education, petrochemicals, refineries, instrumentation and automation, pipelines,

design and engineering, testing, municipal and utility services, storage, security, ship repairs and maintenance.

**Q:** The Energy Lab is part of your special focus this year. Can you elaborate on it?

**A.** Analytical testing & measurement instrumentation are critical components for the growth of the energy and environmental sectors. The Energy Lab technology focus of the show aims to offer a highly-concentrated, lead-generation platform, where exhibitors can meet senior-level buyers active in the industry. The event will offer a plethora of cutting-edge technologies and solutions for the research and analysis of petroleum products, water, waste, soil, air and several other related applications.

**Q:** Another key aspect of the 2015 show will be its focus on education and training of UAE nationals. Can you elaborate on these measures and how do you plan on furthering the inclusion of UAE nationals in the industry?

**A.** We plan to further encourage and expand the inclusion of UAE nationals by creating a bridge between education and training providers, offering programmes that feed into the energy industry and employers. The exhibition will include a forum that addresses graduating energy engineers.

At the same time, employers will benefit from the opportunity to meet with engineering graduates and conduct onsite workshops that could be useful in their selection process. ■

*Answers provided by Anselm Godinho, managing director of International Conferences and Exhibitions (IC&E)*



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# Crew welfare: Keep them safe – and keep them happy

Recruiting crew for offshore installations increasingly means guaranteeing communications both to keep them safe and to keep them in touch, says Vaughan O’Grady.

**A**LLOWING OIL AND gas industry workers to keep in touch when far offshore or in very isolated areas is one of the many bonuses of modern satellite communications. Of course, satellite isn’t always necessary, but, at some point — especially offshore — it becomes the only option. How far out you would be when that happens is a matter for some debate, however. Fibre rings can be found a long way out to sea and, depending on how high you can place it (a nearby onshore mountain could be useful) line-of-sight microwave could extend a signal to more than 100 km.

But, even if your installation can be linked to the shore, fibre, in particular, is expensive. When should, for example, an oil company consider it? Brad Grady, senior analyst with NSR, which provides satellite industry market research and consulting services, explains that when a platform is likely to be needed, then, “depending on how long they believe that asset is going to be in place, a company

will do the analysis as to whether or not they’re going to use terrestrial or satellite”.

Thus offshore exploration, increasingly happening a long way out to sea, often involves satellite or microwave links for some or all of the life of the operation. The development phase may justify more sophisticated communications as wells are drilled and if prospects look good. If production takes place and is likely to continue for some time, fibre could be a reasonable investment. Other technologies — typically Wi-Fi — then extend communications to the staff on board.

“Whatever the communications technology used, one thing that has changed is the needs of crew members”

But, says Grady, “There’s still satellite; it just won’t be used as heavily.” This means that if a contractor comes on site and wants to link with his own network, or if a back-up is required in case fibre links are damaged, the satellite option is always relevant. “It’s always going to be there. It’s not an either/or proposition,” says Grady.

Whatever the communications technology used, one thing that has changed in recent years is the needs of crew members. These days they will expect, at the very least, to be able to call or text their family. Ideally, they would like to do that without having to go up to a bridge or control centre.

That is why there are numerous companies offering them the chance to do that — companies like Globalstar, a provider of mobile satellite voice and data services to businesses, government, and consumers, which offers products like Sat-Fi. This is a hotspot that allows customers to use smartphone or Wi-Fi-enabled devices to send and receive calls over the Globalstar satellite network. “They’ll be able to do email and SMS with friends and family quite comfortably from their own cabin if they like,” says Mark O’Connell, Director of European Sales and Business Operations for Globalstar.

Conventional satellite phones and prepaid service plans are also available from Globalstar in many regions throughout the world — including North Africa. “Our customers can provide crew calling to their employees as part of their main contract with us. Alternatively, they can provide separate crew calling via our prepaid system and share prepaid cards with their crew,” says O’Connell.

Globalstar offers CDMA-based communications via a low earth orbit (LEO) constellation, whose advantages include zero latency — that is, no time lag — and excellent voice quality.

Globalstar is far from alone, of course. Companies offering satellite services globally (like Inmarsat) near-globally (like Globalstar or



**Crew members in remote locations will want to keep in touch with their family and friends (Photo: BP)**

# Health, Safety & Security Review

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Iridium) or regionally (like Yahsat), with satellites at varying distances from earth in a variety of orbits and using various parts of the spectrum (depending on demand, spectrum availability and market), have transformed remote communications in recent years, alongside service providers like Hermes and RigNet.

Thus voice, short messaging service and low-bandwidth internet access, some of which are shared with crew, can be available to just about anyone who can pay for satellite connectivity. There are also more bandwidth-intensive applications available thanks to newer systems like O3b, which is a medium earth orbit system that intends to combine low latency with broadband internet.

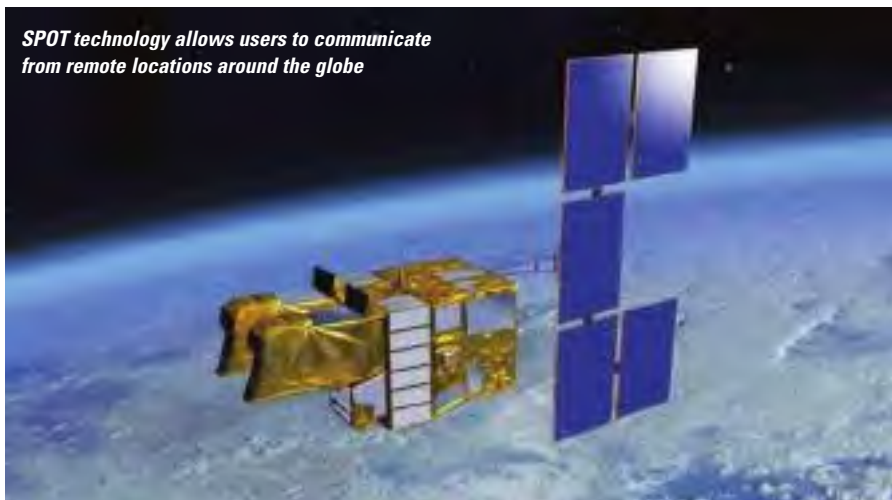
But it is unclear whether the company decision-makers on oil rig or vessel communications would feel that eliminating latency would outweigh such potential disadvantages as cost and, in the case of O3b, the need for a lot of on-deck equipment (notably VSATs) and lack of global coverage (problematic if a rig is capable of going to new locations). "It all really comes down to latency vs. throughput vs. cost vs. coverage," says Grady.

Much of the initial customer base for broadband satcomms will come from large-scale consumer markets or cruise ships, for example, which can use internet connectivity as a selling point. Oil rigs will not have the user numbers or necessarily need that sort of investment; even operational needs will, says Grady, often only require a megabit per second or so download. "Real time video is what's driving a lot of demand," he says. "Seismic data or an ROV checking out the drill site during workover work, for instance. But it's not necessarily as much bandwidth as people expect."

Thus, in theory, a few megs download capacity can be shared between operational and crew needs with no strain on resources. "The most typical deployment is two virtual networks [on a rig] running over the same equipment," suggests Grady. This can even stretch to three if a visiting contractor wants a piece of bandwidth. Some service providers nevertheless are trying to sell the idea of separate networks for crew and operations. This certainly has its adherents. However, says Grady, "a lot more internal logistics need to be taken into account... retrofitting equipment in order to do that is relatively difficult."

Of course, if economics allow, you could do this by taking signals from two different bands, especially as the more reliable Ku and C bands are nearly over-subscribed. For example, if you're offshore, the risk of occasional downtime on a Ka band service due to heavy rain might make it unsuitable for operational use, but crew would be less concerned by occasional breaks in service.

**SPOT technology allows users to communicate from remote locations around the globe**



Alternatively, as Grady points out, if crew are mainly working or asleep, an astute rig owner may just avoid scheduling his own important calls for the few hours when crew need to call home, which, as he says, "improves the economics and utilisation of the satellite network."

One meg may not sound like much, but even with 512 bits/sec, downloading a film could be possible. The continuing march of technology through compression, caching, store and forward and other technologies is also a factor.

“ In theory, a few megs download capacity can be shared between operational and crew needs with no strain on resources ”

Globalstar's Express Data, for example, uses a variety of advanced information compression and performance enhancement techniques, to optimise traffic flow across the existing Internet infrastructure giving a 38kbps performance from 9.6kbps. "Typically, people who use Express Data have a large data requirement," O'Connell explains. "For example, in the fishing community, people who would need detailed weather maps spanning out over a number of days so they can see what conditions they're going to be facing out at sea. It also has applications within the emergency response and disaster relief sectors, oil and gas, forestry, mining — all of these in areas where people are remote."

While some level of crew connectivity for entertainment and socialising — whether real-time streaming or just SMS — is increasingly as important as good wages in tempting crew offshore, many companies

may regard safety and tracking as the most important form of crew welfare. For example, SPOT provides one-way satcoms in very isolated areas. SPOT is a subsidiary of Globalstar that offers emergency notification technology, allowing users to communicate from remote locations around the globe. Thus a SPOT personal tracking device enables individuals to send Check-In/OK messages, Help messages or SOS messages, if necessary, to the emergency services, colleagues or family.

The fact that in today's oil and gas market you can talk to or text friends, possibly even browse the Internet, or be found if in trouble no matter where you are gives you a major advantage over your predecessors from the early days of the offshore oil boom. On the other hand, you are also likely to be much, much further out to sea or away from population centres than they were.

However, if you're hoping to play live, streaming Xbox by satellite on a rig many kilometres offshore, you may have to wait — but possibly not that long. More satellites are going up, including the fast-growing new generation of high throughput satellites (HTS) although the geostationary ones far from earth may still have issues with latency. However, "There's a lot of talk about doing constellation approaches even closer [to the earth] than O3b," says Grady. This could mean not just lower latency but lower prices if competition kicks in, but whether the enterprise market rather than large-scale consumer markets proves a more appealing target for these systems remains to be seen.

On the other hand, if the recent rather nervous discussions at ADIPEC about the lack of skilled younger employees joining the industry are anything to go by, perhaps high speed data satellite communications for crew entertainment might be a way to attract them (along with their iPads, Galaxies and whatever else) out to sea. One way or another, therefore, broadband may soon be going further and higher than ever before. ■



## Hempel's Hempadur AvantGuard wins Frost & Sullivan award

HEMPEL'S HEMPADUR AVANTGUARD product range has won the 2014 Frost & Sullivan Award for New Product Innovation. The award will be presented in May 2015 in London, and recognises the products' ability to provide superior anti-corrosive protection for steel structures in tough environments.

Hempadur AvantGuard activated zinc primers include patented AvantGuard technology to provide better anti-corrosive protection than zinc epoxies without AvantGuard. The coatings are developed to protect industrial structures and equipment in C4 and C5 corrosive conditions, where saltwater and high humidity corrode unprotected steel. They can be used in a range of industries and applications, from offshore oil and gas platforms to power plants and wind turbines.

The award recognises the products' ability to offer reduced corrosion, improved performance

in extreme temperatures and superior mechanical strength.

Frost & Sullivan senior research analyst Soundarya Shankar said, "The AvantGuard technology uses hollow glass spheres and a proprietary activator to activate more zinc and enhance the anti-corrosive properties of the coating."

"Acknowledging the need for different types of protective coatings in different regions of Europe due to varied climatic conditions, the company customises its solutions to suit specific customer needs."

Pernille Lind Olsen, group protective product director at Protective Marketing, added that the company had spent years developing AvantGuard and believed the technology was the biggest step forward in anti-corrosive coatings since zinc coatings were first introduced during the 1960s.

"As well as delivering stronger anti-corrosive performance, AvantGuard coatings can be applied with standard application techniques. They show high tolerance to excessive dry film thicknesses and different application conditions, which help customers improve application productivity."

The increased protection and durability of Hempadur AvantGuard coatings have been



**Hempel is developing more AvantGuard technology-enabled products, including products that can be applied to components off-site and then transported for on-site installation**

proven in extensive Hempel tests, including salt spray tests (ISO 12944 part 6), cyclic corrosion tests (ISO 20340 - NORSOK M-501 revision 6) and thermal cycling resistance tests (NACE cracking test and Hempel's welding test).

The Hempadur AvantGuard series was released worldwide in September 2014. Currently, it comprises three zinc primers (Hempadur AvantGuard 550, Hempadur AvantGuard 750 and Hempadur AvantGuard®770).

“Designing a global solution and tailoring it to suit customer requirements is Hempel's USP”



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## Harris CapRock launches wireless connectivity service

SATELLITE COMMUNICATION PROVIDER Harris CapRock has launched a satellite, wireless and terrestrial connectivity service Harris CapRock One for offshore industries.

According to the company, Harris CapRock One is an intelligent, highly-integrated, end-to-end service that transparently switches between the various transport mediums to optimise communications for customers around the globe.

“Customers in the energy and cruise industry, for example, often struggle to obtain reliable, always-on communications when their vessels, drilling sites and ships change their global positions and communications needs. With Harris CapRock One, they can replace current single or dual-band communications support options with a multiple-medium solution that exceeds their needs by providing optimal connectivity at any given time,” added the company.

Tracey Haslam, president of Harris CapRock, said that Harris CapRock is going to change the way the company’s clients experience managed communications services. “Harris CapRock One is the first commercial service of its kind to unify satellite, wireless and terrestrial connectivity into one platform. Customers want a solution that is flexible and optimises their operations no matter where they are located, or how mobile their assets are. Harris CapRock One delivers that and more.”

Harris CapRock’s service offering combines a multi-band antenna with an Intelligent Communications Director (ICD). The multi-band antenna allows for C-, Ku- and Ka-band connectivity with no additional moving parts, meaning that any satellite orbiting the earth can be accessed with no technician intervention required.

The ICD is a geographically aware smartbox that recognises where the multi-band antenna is around the world and carries a



**Harris CapRock One offers a wide range of communication solutions**

database of the network footprints available. The device is aware of the operator’s traffic and can route traffic intelligently over the most appropriate network path based on speed, latency, location and cost. By optimising the network traffic, the ICD enhances the end-to-end experience, completing an intelligent routing solution with end-to-end application performance management, added Haslam.

Other telecommunication services supported by Harris CapRock One include fibre, point-to-point and point-to-multi-point radio, WiMax, terrestrial Multi-Protocol Label Switching (MPLS) and private and carrier-based Long Term Evolution (LTE).

Harris CapRock is a global provider of managed satellite and terrestrial communications solutions specifically for remote and harsh environments including the energy, government and maritime markets.

## Safety Services Group opens new facility in India

UAE-BASED SAFETY Services Group (SSG), a specialist in lifting equipment, engineering and turnkey solutions, has opened a new chain manufacturing facility in Kochi, India. Managed by subsidiary Bash-P International, the facility will manufacture Grade 80 lifting chains to meet industrial demand in India, the Middle East and Africa.



**PK Kunhalikutty, Minister for Industries and Information Technology, Government of Kerala, inaugurating the new manufacturing facility in the presence of Mohamed Basheer, President, Safety Services Group and other dignitaries**

PK Kunhalikutty, Minister for Industries and Information Technology, Government of Kerala, inaugurated the new facility located at Kinfra Export Promotion Industrial Park, Kochi, on 26 February. He said, “The presence of companies such as SSG reinforces the strong trade and investment ties between UAE and Kerala.”

Mohamed Basheer, President, SSG, said, “The new facility in Kochi is the first chain-manufacturing unit in South Asia employing a unique process of production, and thus producing the highest standard of lifting chains available in the current market. The facility will help meet the rising demands of oil and gas, construction and marine industries.”

SSG’s services extend across product quality, safety testing and inspections, engineering support, management system certification, product design and engineering as well as training and education.

## SPX Bolting Systems wins order for Qatar maintenance project

SPX BOLTING SYSTEMS in the Middle East, with support from its UK counterpart, has secured a US\$1.2mn order to supply tools and equipment to Prelect, the Qatar-based company working on a major five-year maintenance shut-down programme for a client in the LNG sector. The order, one of the largest for SPX Bolting Systems, was dispatched from the UK in late January and will be used during the planned five-year maintenance shut-down period.

Prelect specialises in maintenance, inspection, mechanical support and customised long-term solutions to ensure plant reliability and asset integrity.

“The ‘SPX Bolting Systems’ brand is relatively new to the region, so we were particularly pleased to be able to support our preferred Qatar bolting partner Prelect, in this way,” says SPX Bolting Systems’ Middle East regional sales manager Wales Thomas.

“We also trained 40+ Prelect staff for mechanical bolting activities to API standards, and expect to train a similar number in early 2015,” he added.

As part of the contractual agreement, SPX provided calculation software to Prelect and its client, and supported Prelect in Qatar during the initial meeting at the client’s head office in Doha. The client also showed a particular interest in the SPX FLANGEPRO Integrity Management Software, which Prelect will manage and facilitate on site.

The SPX FlangePro Adviser software has recently been used by Prelect-FMS at Basra Gas Iraq, and the company is looking to introduce it to its other clients in Qatar.

## AMETEK's new handheld pressure calibrator unveiled

A NEW HANDHELD pressure calibrator that delivers deadweight tester accuracy in an on-site instrument has been introduced by Crystal Engineering, subsidiary of AMETEK Test & Calibration Instruments.

The HPC40 Series has been designed for process control applications such as verification or calibration of pressure gauges, transducers, transmitters, pressure switches and safety valves. It is suitable for pressures ranging from vacuum to 15,000 psi with accuracy of 0.035 per cent of reading for all ranges. Applications include laboratory, power generation, nuclear power, automotive, brewing, chemical processing, water purification, wastewater treatment, food processing, safety and quality assurance.

The series is the world's first mA loop calibrator that is fully temperature compensated from -20°C to 50°C, the company added. This enables it to deliver the same accuracy whether measuring pressure, current, voltage or temperature.

A single HPC40 Series device can replace several gauges or calibrators.



The HPC40 Series

## Schlumberger's industry-first dissolvable plug-and-perf system

SCHLUMBERGER'S INFINITY DISSOLVABLE plug-and-perf system uses fully degradable fracture balls and fully degradable seats instead of plugs to isolate zones during well stimulation.

Olivier Le Peuch, president of Completions at Schlumberger, said, "With the new Infinity system, the ball and the seat assemblies both fully dissolve on contact with common completion fluids. As a result, the well is left with fullbore access and enables customers to bring production online faster, more efficiently and more cost effectively."

The first-ever fullbore interventionless plug-and-perf system eliminates the need for milling operations and leaves nothing behind in the wellbore. As a result, no plug debris is produced to surface where it can potentially interfere with surface equipment. The technique eliminates lateral length restrictions, which maximises reservoir contact and estimated ultimate recovery, and it greatly reduces intervention-related risks and costs.

The Infinity system underwent extensive material science and laboratory validation and has been field tested in multiple unconventional reservoirs across the USA. Numerous wells were stimulated across five of the major plays in North America without any type of mechanical intervention required.



Infinity dissolvable plug-and-perf system

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With over 30 years of experience, OCS is a recognized leader in the delivery of comprehensive services for Maintenance, Repair & Overhaul (MRO), Total Corrosion Management (TCM) and Crew Management across the Oil & Gas and Marine sectors.

It is a joint venture between Fluor Investment & Ventures and B+W Offshore, the world's second largest Floating Production System Provider, based on the Odebrecht exchange.

OCS operates from throughout the globe through its companies: OCS Services Ltd. (BVI), OCS Services DMCC (Dubai), OCS Services (India) Pvt. Ltd. (Mumbai) - India and OCS Services Pte. Ltd. (Singapore).

It has long-term associations with leading oil & gas operators and contractors and has served 23 countries across Asia, the Americas, Europe, Australia and Africa.

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# Glad to be back home

After almost three years away from the Middle East, Monitor Coatings is now back in Dubai's Jebel Ali Free Zone.

**T**HE FREE ZONE was chosen as the Monitor Coatings' strategic home for its flagship facility, centrally located to service the Middle East. Well known for its durable, sustainable oilfield tool repair portfolio, Monitor Coatings together with its new owners Castolin Eutectic has now opened its state-of-the-art thermal spray and repair centre in Jebel Ali.

Surface engineering and advanced coatings remains the group's core business, incorporating its own advanced technology for thermal spray, and utilising its proprietary ceramic sealing systems (SealPlex® range), to deliver extended and enhanced component



**The new facility in Jebel Ali**

performance. Now with more than 35 service centres around the world, including the UK, Singapore, Mexico and Norway (Trio), and its OEM manufacturing capability in Dalian, North East China, exclusively manufacturing oilfield tools for directional drilling, Monitor is able to draw on more than 40 years' experience in oilfield tool repair.

Monitor's systems still mirror the stringent aerospace standards which underpin all of the group's work. Each of the service centres is now leading the way towards API Q1, 9th Edition along with Safety (OHSAS 18001), Environmental Husbandry (ISO14001) and Risk Management (ISO 31000). The group's united global quality policy ensures uniform quality and service.

Monitor's patented carbide coating and ceramic sealing of mud motor rotors still ranks as number one in the world for drill string surface engineering applications, according to the company, with Monitor holding more than 40 per cent of the global repair market. Repeat custom is fundamental to the group's strength in the market, underpinned by a sustainable cost competitive guarantee.

At the 15,240 sq m Jebel Ali facility, machining, grinding, honing, welding, heat treatment, painting, NDT and a fully equipped metallurgical laboratory all support the state-of-the-art HVOF, Arc, thermo-chemical conversion coatings and thermal spray capabilities. Monitor now has the capability of stripping chrome as well as carbide for repair applications.

## Where next?

As part of Castolin's continuous investment plans, a new laser cladding facility is set to be launched in early 2016. In addition over 1,000 sq m of floor space has been earmarked for the group's global R&D facility in Jebel Ali. Next year will see the unification and centralisation of resources focused on innovation for the next generation surface engineering and advanced coating system applications for the oil industry, currently spread between the Swiss and UK facilities. ■

For further information please contact Caryn Dwelle, Key Account Manager (Caryn@monitorcoatings.com) or Dr Bryan Allcock, CEO Services (Bryan@monitorcoatings.com).

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## GE latest compressor to reduce costs and increase profitability

GE'S NEWEST, SMALLEST and lightest compressor yet – high pressure ratio compressor (HPRC) – requires fewer units per train, significantly reducing overall footprint. These combined innovations mean reduced shipping weight, easier installation, minimised footprint, lower power consumption, increased reliability and reduced operating costs. The compressors will mostly benefit natural gas production, both onshore and offshore.

“The HPRC will have a major impact on our customers,” said Luca Maria Rossi, general manager product management, Turbomachinery Solutions, GE Oil & Gas. “Five years in the making, it will help our customers across a number of important metrics: delivering a train footprint which is up to 50 per cent smaller, 30 per cent lighter and with five per cent less installed power compared to traditional compression trains”.

High pressure ratio compression is a new technology which leverages GE Aviation aerodynamic experience, applied to GE's

BCL compressors line, the Swedish company said. GE is also planning to apply it to MCL and ICL compressors.

Applicable to many gas processes, it is well-suited to both low and medium molecular weight mixtures.

The HPRC's technology is based on an innovative architecture, which combines shrouded and unshrouded impellers on a single, high-speed shaft, achieving higher efficiency than any other available technology thanks to full 3D aerodynamic profiles derived by aircraft engine. Applications which would have required multiple compressor bodies, will now require only one with GE's HPRC, as the compressors have an increased head per stage, with a shorter bearing span, which reduces the number of compressor casings required. Individual HPRC units are already smaller and lighter than traditional compressors, and the elimination of units per train is another key improvement in overall plant footprint, reliability, availability and weight.

## DNV GL JIP to improve performance of sour service pipeline projects

SOUR SERVICE FLUIDS from wells place significant demands on pipeline material, particularly in deeper water. This can present major technical and financial challenges for pipeline operators as the fluids can cause fractures and cracks, which affect pipeline performance and reliability.

DNV GL has launched a joint industry project (JIP) to develop a methodology to evaluate fractures and cracks using a single edge notched tensile (SENT) test designed specifically for sour service environments. Eight participants are on board and the JIP is still open for new participants, the company has announced.

The JIP is a joint effort between DNV GL Singapore Deepwater Technology Centre and DNV GL's laboratories in Singapore and Columbus and would be run in three phases over two years.

A pipe material and weld that performs well in air will be significantly less tough and resistant in a sour environment. A SENT test is designed to simulate loading conditions and crack depths similar to those experienced by pipelines operating under normal conditions. Research



*Tronskar said that the JIP will provide a better understanding of the key parameters known to impact fracture toughness test results*

conducted in DNV GL's laboratories shows that in a sour environment, where fluids such as H<sub>2</sub>S, H<sub>2</sub>O and CO<sub>2</sub> may be present, results can be highly variable depending on numerous environmental and test parameters.

Jens Petter Tronskar, DNV GL vice-president and chief technology officer of Deepwater Technology Centre in Singapore, said, “Sour gas is evident in various oil and gas producing regions of the world, in particular, the Middle East. The JIP will provide a better understanding of the key parameters known to impact fracture toughness test results. This will enable the development of a guideline which may further develop into a recommended practice, which will provide significant technical, logistical and financial savings to the industry.”

The Columbus laboratory is also carrying out an ongoing JIP to develop best practice guidelines for performing sour service engineering critical assessments (ECA), scheduled for completion in December 2015. This JIP includes fatigue crack growth rate and fracture toughness tests conducted in a wide range of sour environments.

## Flowrox launches new product for pump and dampener maintenance

FLOWROX, A GLOBAL leader in heavy-duty industrial valve manufacturing and services, is announcing the launch of the Flowrox Expulse™ product, designed to assist during pump and dampener maintenance by reducing noise and vibration associated with traditional methods.

The Flowrox Expulse was designed for use by companies in the Oil & Gas, Mining, Metallurgy, and other industries where pipes and valves are used to move materials or fluids using pressure.

Traditional pulsating pump dampeners are known to produce unbalanced shaking that can result in failure or operational drawbacks, which in turn require additional add-ons and devices to counter its challenges.

Flowrox has designed a complete solution for this effective pulsation dampener system, which reduces noise while settling pressure peaks and ensuring a continuous fluid flow.

One of the most noticeable features on the Flowrox Expulse is the

product's ability to reduce energy consumption by up to 10 per cent, largely as a result of its absorption of up to 90 per cent of pulsations.

In addition, the device's reduction in the hammering of the pipeline and pump can lead to extended operational lifetime for the pump bearing and gearbox - two critical components in pipeline operations that face wear and tear in high-performance environments.

“A shutdown due to a threat to pipe integrity can not only be costly, but hamper the ability to generate revenue for clients who depend on this type of equipment,” said Todd Loudin, President of Flowrox. “Our company has designed the Flowrox Expulse to help reduce the chance of pipe damage and breakage in a cost-effective manner.”

The robust solution offered by the Flowrox Expulse flexible pulsation dampener prevents the collection of sediment, particles or residue thanks to its built-in self-cleaning operation.

## Leistritz releases new L3MA triple screw pumps

THE RECENTLY RELEASED L3MA series of triple screw pumps from Leistritz Pumpen is designed to comply with the American Petroleum Institute's API 676 standard (third edition) for rotary positive displacement pumps in the oil and gas, petrochemical and chemical industries.

Triple screw pumps are self-priming rotating positive displacement pumps suited to handle various oil types and other liquids with a minimum lubricating quality. The design simplicity makes these screw pumps intrinsically reliable and efficient, claims the company. Only three moving parts – a driving spindle and two idler spindles – rotate inside a casing with close tolerances, so forming sealed chambers and provoking the axial displacement of the fluid. The idler spindles rotate without contact with the driving spindle because of the fluid itself. The accurate hydraulic balance and special profile of the screw thread enable a continuous flow with minimum pulsations and turbulence, resulting in low noise levels, even at high rotational speed.

Until now triple screw pumps have been adapted to comply with this standard. Leistritz decided to find the optimum solution and



*Leistritz pumps are used for applications in industrial sectors including oil, gas and petrochemicals*



came up with a new concept. The new L3MA pump has no separate steel casing with an internal liner for the screw spindles to run in. A new spindle material makes it possible to have the spindles run directly in a steel casing and avoids an expensive construction with a coating in a separate liner.

Only three static seals - executed as O-ring seals instead of flat gaskets - are used, eliminating the risk of leakage due to insufficient compressed flat gaskets, claims the company. A single balanced acting mechanical seal has been chosen as the shaft seal. A cartridge seal can be provided as an option. Suction and discharge flanges are according to ANSI B 16.5 class 300 lbs.

The L3MA pump series is available in 12 different frame sizes with defined rotor pitch angles. The pump has a maximum flow rate of 276 m<sup>3</sup>/h, a differential pressure of 20 barg and maximum speed of 3600 rpm. A minimum viscosity of the pumping fluid should be around 10 cSt to continually secure the required lubrication.

## New acquisition brings manufacturing synergy to support growth

ITALY-BASED RACCORTUBI IS confident that its acquisition of Petrol Raccord, announced at the end of 2014, will support growth, as well as bringing benefits such as greater cost efficiency.

The acquisition is the latest in a number of recent investments by Raccortubi, which in 2013 set up three commercial subsidiaries with their own warehouses in Dubai, Singapore and São Paulo to develop its business in the Middle East, Southeast Asia and South America.

Founded in 1949, Raccortubi specialises in the production and distribution of pipes, tubes, fittings and flanges for a wide range of industrial applications, such as chemical and petrochemical plants, oil installations, power plants, shipyards and offshore platforms. The commercialisation of these products has been complemented since 1988 by the provision of butt weld fittings in stainless steel and special alloys produced internally by the group's Techninox manufacturer. The group has benefitted from continuous growth over the years, which it attributes to the lean production method and long-standing relationships established with



international EPC contractors and end users.

Petrol Raccord, meanwhile, has a workforce of almost 100 people. Established in 1969, it has gained significant recognition in the pipe fittings industry on a global scale thanks to its manufacturing range, technological capabilities and added value

based on the customisation of products, according to Raccortubi.

The acquisition sets in motion a series of manufacturing, commercial and international synergies, as well as the possibility to develop greater cost efficiency through group optimisation.

"The inclusion of Petrol Raccord within our group will allow us to propose more complete and interesting solutions to our clients. We are now a group of approximately 220 people with a solid manufacturing and distribution base which operates worldwide," said Sunzeev Swami, managing director of Raccortubi Middle East.

Petrol Raccord will be working alongside Techninox to extend the whole production range from ½" to 56". It will focus in particular on stainless steel, duplex, superduplex and special alloys, while maintaining its existing production of low and high carbon alloys for the power industries. Petrol Raccord produces butt weld fittings up to 56" almost without wall thickness limitations and holds an impressive number of end user approvals, including that of Saudi Aramco.

## LR Senergy's new IP software suite to analyse well data

ENERGY SERVICES COMPANY LR Senergy has released a new version of IP v4.3, which is a formation evaluation and well data interpretation tool.

According to the company, the latest version of the software features many enhancements to key workflows and an advanced technology that makes IP v4.3 the complete well data interpretation package for multi-user, multi-well and multi-discipline.

"The multi-user functionality offers safe and secure data connectivity through multi-user access (MUA), allowing for effective collaboration and fast decision making. Users can now work on mineral solver analysis across multiple wells simultaneously, resulting in more consistent and accurate results," added the company.

The latest version of the software also provides major new multi-discipline tools and workflows for geomechanics and geosteering specialists. This complements established workflows already in place for geologists, engineers and petrophysicists, noted the energy services firm.

The new version of IP v4.3 comprises of a wellbore stability module, which ensures safe drilling mud weight prediction to avoid wellbore instability and failure. It also has a hydraulic flow module that categorises reservoir rock based on flow potential and a domain transfer analysis (DTA), which utilises a new non-linear differential equation solver for predicting log curves.



**Raw production log data can be easily accessed through LR Senergy's new version of IP v4.3**

Along with these new modules comes a range of enhancements including 3D self-organising maps SOM for rock typing. IP v4.3 connects to LR Senergy's ODM (Oilfield Data Manager) software to provide a comprehensive subsurface interpretation suite.

LR Senergy's services encompass geosciences, reservoir engineering, geohazard assessment, marine site surveys, rig positioning, wells engineering and operations, production technology, core analysis, geomechanics, formation damage, reserve and asset evaluation, facilities engineering, project management, power engineering and alternative energy solutions.

## Seagull starts specialised training on deck

NORWAY-BASED SEAGULL MARITIME has announced the launch of two new computer-based training (CBT) modules aimed at on-deck safety for specific types of offshore vessels.

According to Seagull Maritime, the video training programmes cover deck safety for supply vessels and anchor handlers and have been developed in response to demand from its customers.

Both modules draw on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Code as well as offshore industry's guidelines on controlling general deck risks, such as the UK Code of Safe Working Practices for merchant seamen and Guidelines for Offshore Marine Operations.

Chris Thompson, technical advisor at Seagull Maritime, said, "Personnel working on deck must be careful of the hazards specific to offshore operations and should take precautions to be safe at all times. The vessels they work on operate in some of the most demanding conditions at sea. There have been accidents offshore in the recent past that have had fatal consequences, which could have been avoided if simple procedures were followed. These short courses will help owners and managers to focus on those new offshore operations, while also providing a useful refresher for those familiar with the sector."

Thompson added the training focuses on how to control the risks associated with general deck work and features video instruction as well as self-assessment tasks at the end of each chapter.

"Each of the modules is tailored to the vessel type's specific safety challenges. In the case of PSVs, the later part of the course focuses on cargo handling and mooring, while the equivalent section in the anchor handler course highlights towing and working anchors and the risks posed by chains and winches on deck," noted the technical advisor.

Seagull Maritime is a provider of computer-based training systems for seafarers worldwide and offer courses for regulatory compliance and improved seafarer knowledge.



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# RIG COUNT ←



## Middle East & North Africa

The Baker Hughes Rig Count tracks industry-wide rigs engaged in drilling and related operations, which include drilling, logging, cementing, coring, well testing, waiting on weather, running casing and blowout preventer (BOP) testing.

Country	THIS MONTH			VARIANCE	LAST MONTH			LAST YEAR		
	Land	OffShore	Total	From Last Month	Land	OffShore	Total	Land	OffShore	Total
<b>Middle East</b>										
ABU DHABI	26	10	36	0	26	10	36	25	11	36
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	57	0	57	-3	60	0	60	61	0	61
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	51	0	51	4	48	0	48	45	0	45
OMAN	63	0	63	2	61	0	61	57	0	57
PAKISTAN	23	0	23	1	22	0	22	19	0	19
QATAR	3	7	10	1	2	7	9	2	7	9
SAUDI ARABIA	100	24	124	5	101	18	119	97	18	115
SUDAN	0	0	0	0	0	0	0	0	0	0
SYRIA	0	0	0	0	0	0	0	0	0	0
YEMEN	2	0	2	1	3	0	3	3	0	3
<b>TOTAL</b>	<b>325</b>	<b>43</b>	<b>368</b>	<b>11</b>	<b>323</b>	<b>37</b>	<b>360</b>	<b>309</b>	<b>38</b>	<b>347</b>

### North Africa

ALGERIA	54	0	54	7	47	0	47	49	0	49
EGYPT	39	4	43	-6	46	5	49	46	6	52
LIBYA	3	3	6	0	3	3	6	4	3	7
TUNISIA	1	0	1	-1	2	0	2	3	0	3
<b>TOTAL</b>	<b>97</b>	<b>7</b>	<b>104</b>	<b>0</b>	<b>98</b>	<b>8</b>	<b>106</b>	<b>102</b>	<b>9</b>	<b>111</b>

Source: Baker Hughes



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د. ساتيام بريدارشي، كبير خبراء البيانات بشركة هاليبرتون

ليس فقط لماهية البيانات الضخمة، وإنما أيضا لطبيعة التطبيقات الممكن استخدامها، ونوعية المردود أو العائد المتوقع من الاستثمار والابتكار، إلى جانب ماهية التحديات التقنية المطلوبة لذلك. وفي نهاية الأمر، فإن عنصر القيمة في البيانات الضخمة يكمن في الخروج بفهم معين منها، وهو فهم لا يمكن أن يتحقق إلا من خلال التحليل فحسب. إن الوعود الخاصة بتحليل البيانات الضخمة سوف تتحقق فقط عندما تقوم الشركات بشكل استباقي بدمج تقنيات البيانات الضخمة في الاتجاه العام لأعمالها. وتقوم الشركات الرائدة في قطاع النفط بالفعل باستخدام تقنيات تحليل البيانات الضخمة لزيادة إنتاج النفط بتكلفة منخفضة. وما هي إلا مسألة وقت قبل أن تحتل هذه التقنيات قلب صناعة النفط والغاز.

• من المقرر أن يتحدث د. ساتيام بريدارشي وعلي الربيعي إلى مؤتمر تحليل البيانات الضخمة لصناعة النفط والغاز المقرر عقده في الفترة من 19 إلى 21 أبريل/نيسان 2015 في أبو ظبي، وهذه الفعالية البارزة سوف تتيح المجال للأفكار القيادية وتكوين الشبكات والمشاركة ما بين المشترين والبائعين.

• رياض منان هو مدير المؤتمر المشرف على هذه الفعالية. لمزيد من المعلومات عن المؤتمر انظر الرابط [www.oilandgasbigdata.com](http://www.oilandgasbigdata.com).



أصفر زيدي، كبير المستشارين لدى شركة هواوي الشرق الأوسط

على الجانب التحويلي والموهبة والإنتاجية إلخ». وإذا تطلعتنا إلى ما هو قادم، فإنه يمكننا بحسب قول بريدارشي، أن «نتخذ قرارات أسرع وأفضل حيث تقدم البيانات الضخمة والخدمات التشخيصية إلى المستوى التالي نتيجة لتطبيق استراتيجيات التعلم الآلي والذكاء الاصطناعي. إن الأنماط الجديدة التي تنبثق من البيانات يمكنها أن تقود إلى استراتيجيات جديدة في مجال الأعمال لتحسين الكفاءة التشغيلية».

ويرى د. بريدارشي أن تقديم وتنفيذ استراتيجيات البيانات الضخمة التي تسجل أعلى قيمة ربما يتطلب عقلية جديدة. ويضيف: «بشكل تقليدي يُعرف مردود الاستثمار بأنه العائد من ذلك الاستثمار وهو معيار من المهم قياسه في نماذج العمل التقليدية. ورغم ذلك، ومع الحالة المثبتة لتحليل البيانات الضخمة، فإن معيار القياس الصحيح المطلوب قياسه، هو مردود الابتكار. ويتطلب فهم الفارق ما بين الاستثمار والابتكار عقلية استباقية أو تغييرا جذريا يضمن الابتعاد عن عمليات التفكير الراهنة من أجل تنمية الأعمال وتطويرها».

ومع وجود إمكانية لأن ينجح تحليل البيانات الضخمة في إحداث ثورة في عالم صناعة النفط والغاز، فليس من المستغرب أن قادة مجالي التكنولوجيا والأعمال يسعون نحو فهم جديد،

الذي نُقل عنه قوله: «إننا نحاول أن نتعامل بمشروط الجراحين في عمليات خفض التي نقوم بها. ومع ذلك فإننا بصدد التأكد من أننا لا نقوم بخفض الاستثمارات في التكنولوجيا».

ويبدو أن فوائد استخدام تقنية البيانات الضخمة تفوق تكلفة الاستثمار فيها. فالفرص الناشئة لزيادة مخرجات الاستكشاف والإنتاج وخفض النفقات وتسريع القرارات وتحسينها، ربما تكون الفوائد التي يمكن إدراكها وفهمها بصورة أوضح. وتحديدا فإن القدرة على التحليل في الوقت الفعلي، والاستجابة لتدفق البيانات، تعد واحدة من المزايا الأساسية. ووفقا لتعليق زيدي فإن «القدرة على تتبع وتحليل واستخلاص القيمة من البيانات يسمح للشركات بتحديد الفرص، وإلقاء الضوء على المسائل العاجلة مع زيادة الإنتاجية والكفاءة». وبمقدور صناعة البيانات الضخمة والتحليل أيضا دعم تطوير وتنمية حقول النفط الرقمية، ودمج تقنيات التشغيل مع تكنولوجيا المعلومات، لتحسين عملية صنع القرار وتعزيز الأداء التشغيلي والتجاري. وإذا نظرنا إلى المسألة بشكل كلي، فإن إضافة التحليل التجريبي العملي إلى التشخيص القائم المبني على أسس مادية، يمكن أن ينقل الصناعة إلى مستوى جديد من تحسين الأعمال وتطويرها. ويضيف زيدي: «إن حلول البيانات الضخمة تعد جزءاً من تطوير حقول النفط الرقمية، ويتم ضبطها لتعزيز عمليات التشغيل التجاري للمشغلين لكي يستطيعوا مشاركة المعلومات الآنية، والمحافظة على الاتصال والرقابة والتحكم بشكل دائم، مع تخفيف المخاطر في بيئة عمل أكثر أمناً وسلامة».

### مردود الابتكار

يشير د. بريدارشي إلى فوائد ومنافع أخرى فيقول: «سوف تكشف البيانات الضخمة عن جوانب عدم الكفاءة الخفية المطروحة في مجال النفط والغاز بما في ذلك عمليات الحفر وعمل المعدات وسلسلة التوريد وإنفاق المستهلكين

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## البيانات الضخمة في صعود مستمر



علي الربيعي، خبير صناعة التحليل والبيانات الضخمة والاستشاري بمجموعة الربيعي للتحليل

ويتفق علي الربيعي، خبير صناعة التحليل والبيانات الضخمة والاستشاري بمجموعة الربيعي للتحليل، مع هذا الرأي بقوله: «المنصات الحالية في الغالب محفوظة في صوامع ويكون الدخول إلى البيانات الأولية محدوداً أو مقيداً عبر نطاق العمل. وهذا الأمر في حاجة إلى تغيير من أجل تفعيل الاتجاهات الجديدة في وضع نماذج البيانات إلى جانب دمج وحوكمة البيانات».

وتمثل مسائل الأمن وجمع البيانات ومشاركة البيانات أحد مجالات الاهتمام الأخرى. ويلقي أصغر زيدي، كبير المستشارين لدى شركة هواوي الشرق الأوسط، الضوء على أهمية سلامة البيانات، ولكنه في الوقت ذاته يقول: «إن امتلاك كمية زائدة من البيانات التي تم جمعها، لا ينبغي بالضرورة أن تنتج عنه معدلات مرتفعة من ضعف حصانة البيانات. وإذا كان الإطار التقني السليم مطبقاً، فإن شركات النفط والغاز يمكنها أن تبقى محمية. بغض النظر عن كمية البيانات التي تجمعها».

ومع انخفاض أسعار النفط في الشهور الأخيرة، اضطرت بعض الشركات إلى خفض عدد الموظفين والمشروعات. ومع ذلك فمن المهم الإشارة إلى التعليقات التي أدلى بها مؤخرًا كيمبرلي روس، المدير المالي لشركة بيكر هيويز،

### ينظر رياض منان في التحديات والفوائد الخاصة بالبيانات الضخمة التي لديها القدرة والإمكانيات لإحداث انقلاب في صناعة النفط والغاز

اعتادت شركات النفط والغاز توليد البيانات في جميع نواحي عملها بالطريقة التقليدية، ولكنها الآن تقوم بتوليد كميات ضخمة من البيانات بشكل روتيني وبمعدلات مطردة. وفي هذه الحقبة، التي تتميز بانخفاض أسعار النفط وتراجعها، لاشك أن تحليلات البيانات الضخمة تتيح فرصاً عديدة لضمان إنتاج أكثر كفاءة للنفط، وخفض التكلفة، وتقليل المخاطر، وتحسين معدلات السلامة، وتعزيز الالتزام التنظيمي، ودعم تطوير عملية اتخاذ القرارات برمتها.

وفي الوقت الحالي صار استغلال تحليل البيانات الضخمة من الأولويات القصوى في قطاع النفط والغاز، ليس فقط للخبراء التقنيين، وإنما أيضاً لقادة ورؤساء الشركات. ومع ذلك فإنه لا يزال هناك الكثير من العقبات الكؤود التي لا بد من التغلب عليها عند تطوير وتنفيذ الاستراتيجيات الخاصة بالبيانات الضخمة.

### التغلب على التحديات

تجد حالياً شركات النفط والغاز، وبشكل متزايد، أن تعريف البيانات الضخمة لا يتم من خلال تحديد كم البيانات التي تمتلكها تلك الشركات، وإنما من خلال كيفية تحليل تلك الشركات واستخدامها للبيانات. ووفقاً لما قاله د. ساتيام بريدارشي، كبير خبراء البيانات بشركة هالبريتون: «من أجل توليد أكبر قيمة من البيانات الضخمة، تحتاج الشركات إلى دعم التقنيات الناشئة والتخلص من صوامع البيانات». ويضيف بريدارشي أن شركات النفط والغاز يجب عليها أن تحذو حذو الشركات الكبرى في القطاع الصناعي والتي «قامت بهدم صوامع البيانات الخاصة بها سواء على المستويات التنظيمية أو التقنية».



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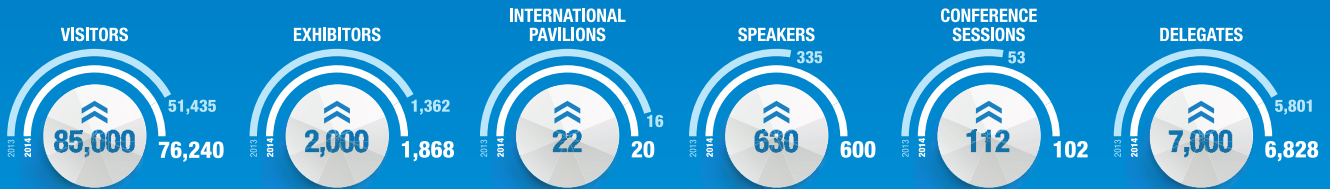


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## جلف ساندرز بتروليوم تعلن عن اكتشاف الغاز في المغرب



تم حفر بئر DOB1 لعمق 1140 متراً

تصريحات جلف ساندرز بتروليوم، أظهرت القراءات العالية لوجود الغاز بدرجة كبيرة، والتي تم الحصول عليها أثناء الحفر إلى جانب تحليل العينات الجيولوجية وسجلات كابلات الحفر، وجود خزان من الحجر الرملي الحامل للغاز من النوع الممتاز.

قالت شركة جلف ساندرز بتروليوم إنها قد عثرت على غاز في البئر الاستكشافية المعروفة باسم دوار أولاد بلخير-1 (DOB-1) في إطار الترخيص الممنوح للشركة بالحفر في منطقة مركز الغرب شمال المغرب. وتعد (DOB-1) البئر الثالثة التي يتم حفرها في المنطقة المذكورة، بناء على تحليل الشركة لبيانات المسح الزلزالي ثلاثي الأبعاد الذي حصلت عليه في النصف الثاني من عام 2013، وكان قد تم العثور على الغاز في البئرين الأولى والثانية المعروفتين باسم LTU-1 و DRC-1 والتي تم حفرهما بموجب هذا الترخيص أيضاً، وقد تم حفر البئر الحالية (DOB-1) وفق عمق إجمالي 1140 متراً، وأمكن التكهن بوجود الغاز عند عمق يقرب من 808 أمتار مع اكتشاف الخزان المبدئي المستهدف. وقال مهدي سجاد، الرئيس التنفيذي لشركة جلف ساندرز بتروليوم: «إننا سعداء بنتائج الحفر وعمليات اختبار الغاز المتدفق في بئر (DOB-1)، وهذه هي المرة الثالثة على التوالي التي تبين نتائج الحفر فيها نجاح الشركة في الكشف عن الغاز في المغرب باستخدام بيانات المسح الزلزالي ثلاثي الأبعاد التي تم الحصول عليها ومعالجتها في 2013-2014. وإننا مستمرون في بذل الجهد لبدء الإنتاج من هذه الآبار التي تم اكتشافها. ونحن - في الحقيقة - نتلقى مساعدات قيمة للغاية من المكتب الوطني للهيدروكربونات والمعادن لضمان تحقيق ذلك على وجه السرعة». وبحسب

## تنمية نفط عمان وقطر للبترول تتعاونان في مشروع بحري

لإعادة ضخها من جديد. وسوف تحدد برو-سيب طريقة العمل المتبعة عن طريق استخدام دورات مخصصة لالتقاط تلك المواد من المياه، وتجديد المياه مع تطبيق ذلك على بعض المجاري المائية المحددة. كذلك سيتم تجهيز وحدة تجارية لمدة ثلاثة أشهر، ثم يتم تشغيلها في العملية المطلوبة لأجل إجراء مزيد من التجارب الإضافية بهدف تهيئة التقنية للاستخدام الميداني. وقال باتريك أوبريان، الرئيس التنفيذي لبرنامج «وسيط تكنولوجيا الصناعة»: «هذا المشروع يمثل بحق أول مشروع تعاوني صناعي مشترك يتم تنفيذه برعاية برنامج «وسيط تكنولوجيا الصناعة» بين اثنتين من شركات النفط الوطنية في منطقة الشرق الأوسط. إننا نشعر بسعادة بالغة لنجاحنا في تيسير حدوث هذه التنمية التكنولوجية على أساس تعاوني في مجلس التعاون الخليجي ونتطلع إلى رؤية النتائج التي تحققها برو-سيب». وقد بدأت بالفعل العمليات التمهيدية لاختبار الأوساط، ومن المقرر عقد الاجتماع القادم لمجموعة التوجيه في العاصمة القطرية الدوحة في شهر مارس/آذار.

شركات النفط الوطنية. وسوف يستخدم المشروع، الذي انطلق في ديسمبر/كانون الأول 2014، تقنية معالجة المياه المنتجة من الوسائط لشركة برو-سيب المعروفة باسم Osorb Media. وتقوم تلك التقنية بامتصاص المواد الهيدروكربونية الشاردة والمنتشرة والذائبة في الماء، إضافة إلى امتصاص المواد الكيماوية المنبعثة من حقول النفط من المياه المنتجة إما لتصرفها والتخلص منها، أو

قامت شركة برو-سيب الأمريكية بتدشين مشروع صناعي مشترك يستمر لمدة عام ويهدف إلى تيسير استخدام التقنيات الصناعية في منطقة الشرق الأوسط بالتعاون مع شركتي قطر للبترول وتنمية نفط عمان. وسوف تتعاون الشركات الثلاث في وحدة بحرية لتجديد الوسائط وإزالة النفط من المياه فيما يعد المشروع الأول من نوعه في منطقة الشرق الأوسط الذي يتضمن تعاوناً ما بين اثنتين من الاجتماع المقبل لمجموعة التوجيه سيعقد في الدوحة





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على جذب الاستثمارات اللازمة في مجال التنقيب والإنتاج، يتوقع بيروول أن تصبح لمسألة أمن الطاقة أهمية أكبر في أجندة السياسات العالمية. كذلك أكد كبير الخبراء الاقتصاديين لوكالة الطاقة الدولية، في تصريحه، على الدور المتزايد في الأهمية الذي تقوم به منطقة الشرق الأوسط بوصفها مستهلكا للنفط، وأيضا بوصفها ثاني أكبر قوة محركا لنمو الطلب العالمي على النفط بعد الصين. وهذا ناتج ليس فقط عن الزيادة المطردة في عدد السكان والاقتصادات النامية لتلك الدول، على حد قوله، وإنما عن مبالغ الدعم الكبيرة التي وصفها بأنها «مسألة خطيرة»، موضحا أن المنطقة قدمت ما يقرب من نصف إجمالي المبالغ الموجهة لدعم الوقود الأحفوري العالمي في عام 2013 والذي يقدر بـ 550 مليار دولار أمريكي.

وتنبأ بيروول بأن السوق سوف تستعيد التوازن في غضون الشهور القليلة المقبلة، حيث من المتوقع أن تؤدي التخفيضات التي أصابت الاستثمار في المناطق عالية التكلفة، مثل أمريكا الشمالية والبرازيل، إلى خفض الإنتاج في حين أن انخفاض الأسعار يؤدي إلى زيادة الطلب، وأشار بيروول إلى إجمالي التأثير السلبي لانخفاض أسعار النفط على اقتصادات منطقة الشرق الأوسط وشمال أفريقيا، متوقعا انخفاض إيرادات النفط الخاصة بالمنطقة إلى ما يقرب من 400 مليار دولار أمريكي في عام 2015 مقارنة بحوالي 800 مليار دولار أمريكي في عام 2014.



الشرق الأوسط سيلعب دوراً حيوياً في سوق النفط العالمية لسنوات عديدة قادمة

## الشرق الأوسط سيظل «حجر الزاوية» في سوق النفط العالمية

المصدرين في يوم من الأيام» نتيجة للطلب المحلي الضخم على النفط. وأضاف بيروول: «إن منطقة الشرق الأوسط تعد بمثابة حجر الزاوية في سوق النفط العالمية، وستظل كذلك لسنوات طويلة في المستقبل». وقال بيروول إنه مع توقع نمو الطلب العالمي على النفط إلى 104 ملايين برميل يوميا بحلول عام 2020 مقارنة بالمعدل الحالي الذي يبلغ 90 مليون برميل يوميا، فإنه سيحتتم على منطقة الشرق الأوسط سد الفجوة، وسوف يكون من الضروري أن يأتي القدر الأكبر من هذا النمو في الإنتاج من العراق الذي يمكنه تطوير احتياطات النفط الضخمة التي يملكها بتكلفة قليلة نسبيا. ومع ذلك ومع حالة الفوضى الجيوسياسية التي تلقي بظلال من عدم اليقين على قدرة المنطقة

في حديثه لمؤتمر الشرق الأوسط، الذي عقد في العاصمة البريطانية لندن في 26 فبراير/ شباط والذي نظّمته جريدة التليجراف، صرح فاتح بيروول، كبير الخبراء الاقتصاديين في وكالة الطاقة الدولية، بأن منطقة الشرق الأوسط ستظل تقوم بدور حيوي بالغ الأهمية في سوق النفط العالمية، وبالتحديد في الفترة التي تبدأ من حوالي عام 2020، وذلك عندما يبدأ الإنتاج القادم من مناطق وأقاليم أخرى منتجة للنفط في التباطؤ. وقد أوضح بيروول، الذي من المقرر أن يخلف مازيا فان دير هويغن في منصب المدير التنفيذي للوكالة الدولية في وقت لاحق من هذا العام، أنه بالرغم من أن الولايات المتحدة الأمريكية ربما يكون لديها القدرة على زيادة الإنتاج، فإنها «لن تكون من كبار

## مصفاة جيزان السعودية تبدأ الإنتاج في 2017



صورة فنية لمدينة جيزان الاقتصادية

عام 2016. وقد أعلن السيد علي النعيمي، وزير النفط السعودي، مؤخرا أن حركة التنمية في مدينة جيزان الصناعية لن تتأثر بانخفاض أسعار النفط، وقال النعيمي: «إن تنمية جيزان سوف تستمر وسوف تمضي قدما كما هو مخطط لها».

تتوقع شركة أرامكو السعودية أن تصبح الوحدات الأولى من مجمع مصفاتها الجديدة في ميناء جيزان، والتي تبلغ طاقتها الإنتاجية 400 ألف برميل يوميا، جاهزة لبدء العمل في عام 2017. وحسبما أفادت وكالة رويترز، فإن مصفاة جيزان تعد جزءاً من خطة بقيمة 20 مليار دولار أمريكي لإنشاء مدينة صناعية في جيزان، التي تقع في جنوب غرب المملكة العربية السعودية، والتي سوف تشمل أيضا محطة للكهرباء بطاقة 4000 ميغاواط، وميناءً تجارياً ورسيفاً للمصفاة. وقد صرح السيد خالد الفالح، الرئيس التنفيذي لشركة أرامكو السعودية بقوله: «إننا نتوقع أن يبدأ العمل في بعض الوحدات، وبخاصة المنشآت، في عام 2017 ولكن ينتظر الانتهاء من جميع الأعمال بحلول عام 2018. ونحن الآن بصدد الانتهاء من التصميمات، والعمل حاليا يجري في تنفيذ أعمال الأساسات الخاصة بالمشروع بواسطة بعض مقاولي الإنشاءات». وكانت بعض المصادر الصناعية قد صرحت في شهر نوفمبر/تشرين الثاني الماضي، بأن إنشاء المصفاة الجديدة قد تأخر نتيجة لنزاع خاص بال عقود، مما أدى إلى ترحيل تاريخ إتمام المشروع الذي كان مقررا الانتهاء منه في الأصل في أواخر



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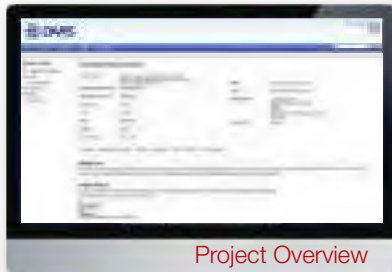
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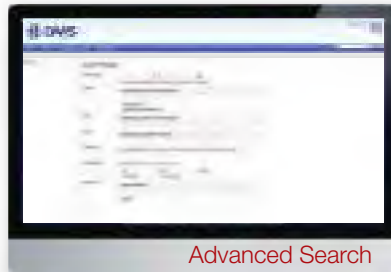
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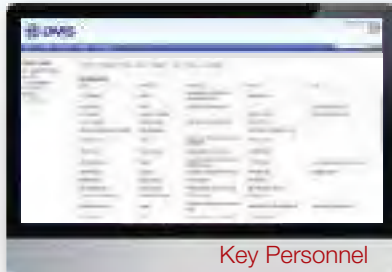
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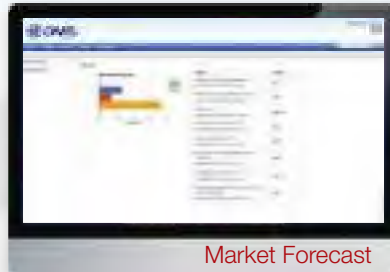
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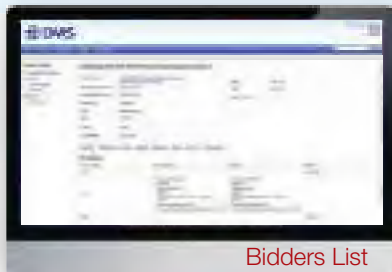
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## CONTACT US

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Country	Representative	Telephone	Fax	Email
China	Ying Mathieson	(86)10 8472 1899	(86) 1084721900	ying.mathieson@alaincharles.com
India	Tanmay Mishra	(91) 80 65684483	(91) 8040600791	tanmaymishra@alaincharles.com
Nigeria	Bola Olowo	(234) 8034349299	-	bola.olowo@alaincharles.com
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## رئيس مجلس الإدارة: دريك فوردهام

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التصميم والإخراج الفني: محمد مسلم النجار [alnajjar722@gmail.com](mailto:alnajjar722@gmail.com)

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