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Oil Review Middle East

Covering Oil, Gas and Hydrocarbon Processing

VOLUME 19 | ISSUE 5 2016

High hopes for Egypt's energy future

- Middle East pipeline prospects
- Recent drilling innovations
- Tough tablets for the oil and gas industry
- A new concept for well intervention
- Maximising the potential of big data

Iraq Petroleum 2016 conference highlights the opportunities and challenges for Iraq's oil and gas development

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Editor's note

PROSPECTS FOR THE oil and gas industry could be looking up, with the latest OPEC and IEA reports both forecasting a rebalancing of the oil market in the second half of the year. And while Wood Mackenzie forecasts a reduction in global upstream capital spend of 22 per cent between 2015 and 2020, it points out that the Middle East faces fewer spending cuts than elsewhere as the oil producers pursue projects to maintain market share. In North Africa, Egypt is a bright spot, with major investments such as Eni's Zohr project underpinning investment (see p12). And Iran has emerged as OPEC's fastest source of supply growth this year as it seeks to reestablish its market share following the lifting of sanctions (see p13). Also in this issue we look at an exciting new technology for well intervention (see p22), the benefits of unlocking the full potential of big data analytics (see p32) and the latest pipeline statistics (see p20).

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Front cover image: Apache Corporation
Arabic front cover image: PDO

➔ Executives' Calendar 2016

AUGUST			
29-1 Sept	**ONS**	STAVENGER	www.ons.no/2016
30-1 Sept	**Global FPSO Forum**	GALVESTON	www.globalfpso.com
SEPTEMBER			
6-8	**SPE Intelligent Energy International**	ABERDEEN	www.intelligentenergyevent.com
6-8	**NACE Egypt Corrosion Conference**	CAIRO	www.egyptcorrosion.nace.org
25-27	**8th Annual Process Safety Conference**	ABU DHABI	www.oilandgasprocesssafety.com
26-28	**Middle East Petrotech**	BAHRAIN	www.metpetrotech.com
26-29	**SPE Annual Technical Conference & Exhibition**	DUBAI	www.spe.org/events
OCTOBER			
1-3	**IIPC 2016 - Iran**	TEHRAN	www.iipc2016.com
9-13	**World Energy Congress**	ISTANBUL	www.wec2016istanbul.org.tr
17-19	**Saudi Arabia Int'l Oil & Gas Exhibition (SAOGE)**	DAMMAM	www.saoge.org
18-19	**Oil and Money**	LONDON	www.oilandmoney.com
30-31	**Gulf Safety Forum**	DOHA	www.europetro.com/en/gsf2016
NOVEMBER			
2-3	**Cyber Security - Oil, Gas & Power**	LONDON	www.wplgroup.com/aci
7-10	**ADIPEC**	ABU DHABI	www.adipec.com
20-23	**SABIC Technical Meeting (STM-12)**	JUBAIL	www.exhibitionofstm12.com
21-23	**Plastics & Petrochem Arabia**	DAMMAM	www.plaschem.4p-arabia.com
27-29	**GPCA Forum**	DUBAI	www.gpca.org.ae/events
29-1 Dec	**Valve World Expo**	DUSSELDORF	www.valveworldexpo.com
DECEMBER			
5-7	**OpEx MENA 2016**	ABU DHABI	www.europetro.com/en/opex_mena16
5-7	**Kurdistan-Iraq Oil & Gas (KIOG)**	LONDON	www.cwckiog.com

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

ONS 2016 to take place in Stavenger with the theme of *"Transition"*

ONE OF THE key industry exhibitions and conferences for the offshore oil and gas industry, ONS 2016 will be held from 29 August to 1 September at Stavenger Forum, Stavenger, Norway. It will provide a forum for the international oil and gas industry to network, debate, do business, plan for the future and showcase the latest innovations.

Sponsored by Saudi Aramco, the ONS conference will bring together heads of governments, ministers, managers, technical specialists and analysts from all over the world, addressing key issues facing the industry. Keynote speakers include Erna Solberg, Prime Minister of Norway, Ben van Beurden, CEO Royal Dutch Shell, Ryan M. Lance, CEO ConocoPhillips, and Daniel Yergin, vice chaiman, IHS.

The conference is built around the main theme for ONS, "Transition", based on three main pillars: transition to a new market reality, transition to a more sustainable world and leadership in periods of transformation.

At a session on Leading through Transition, industry leaders will share their experiences of leading businesses successfully through tough times. A session on security challenges will look at threats from geopolitical to cyber, while a session on Middle East energy and politics will look at the risks and opportunities of doing business in the Middle East, the re-entry of Iran into the oil and gas market, and understanding OPEC.

John Knight, executive vice president, global strategy and business development of Statoil and chair of the ONS conference committee, comments, "With the conference, I look forward to combining the traditional technology focus with a greater understanding of the geopolitical, macro-economic and social-political challenges the industry is currently facing."

A brand new conference arena, Technical Sessions, will provide a forum for innovative companies to present technological solutions addressing industry challenges, ranging from technological quantum leaps to cost effective maintenance of mature assets, subsea boosting for increased recovery and new concepts for drilling operations.

The exhibition features 27,000 sq m of exhibition space in 10 exhibition halls and includes a clean energy park.1,392 exhibitors from 39 countries exhibited at the 2014 event, which attracted over 91,000 visitors.

Other features of the event include ONS Young, which includes a university day and young innovation camp, and the ONS Innovation Awards.

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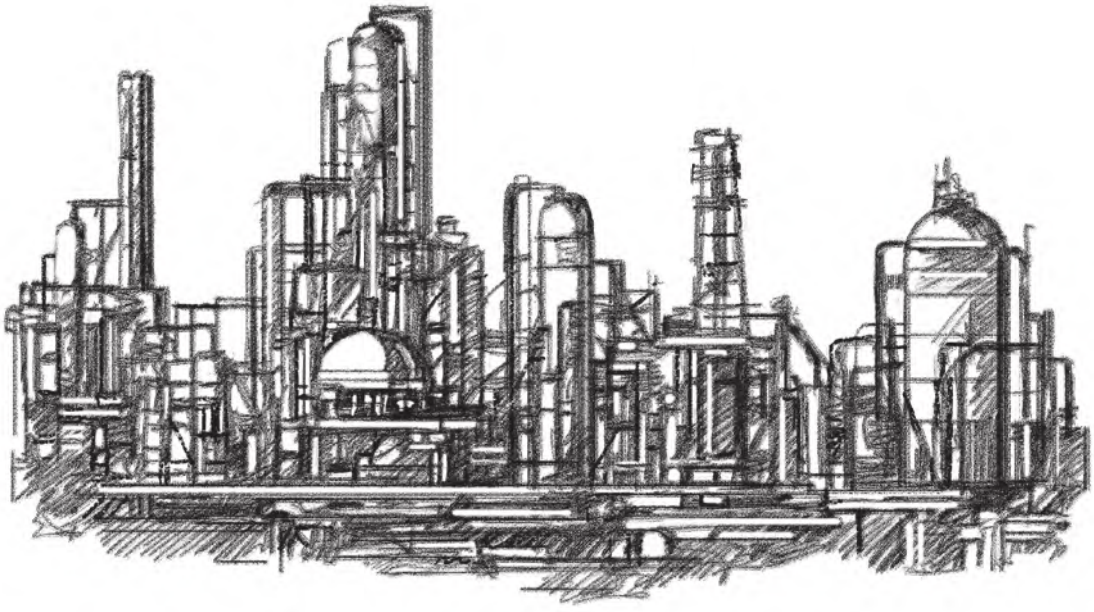

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Major international players bid for Qatari oilfield operations

INTERNATIONAL FIRMS CHEVRON Corp, Royal Dutch Shell Plc, Total SA, ConocoPhillips and Maersk Oil Qatar have submitted bids to operate Qatar's biggest offshore oil field, industry sources have revealed.

According to the sources, state-owned Qatar Petroleum received proposals from the five oil companies to enter a production sharing agreement to manage the Al-Shaheen field. Qatar Petroleum is expected to award the contract for the oilfield, which is 80 km off Qatar's coast and currently produces around 300,000 bpd, in the second half of the year.

Maersk Oil Qatar, a unit of Copenhagen-based AP Moeller-Maersk A/S, has developed and managed the Persian Gulf field since 1992. Its agreement with Qatar Petroleum ends in mid-2017 and it was expected that Maersk would renew its 25-year production agreement on Al Shaheen field when its licence runs out. However, in an unexpected turn of events, the state put out a tender for the field. The company recently commented that it was involved in a tender process and there was a chance it could lose the Qatari field, its largest oil producer.

Ron Mills, CEO of consultants Qamar Energy, commented to Bloomberg that the loss of the field would be a "severe blow" for Maersk Oil and that even if the company is selected again, Qatar Petroleum will probably take a majority stake of as much as 70 per cent and a bigger share of the field's output.

A Qatari industry source told Reuters that the Gulf state had invited international majors to the tender because it wanted to raise production at the field to 500,000 bpd. Qatar, which is the world's largest exporter of LNG, has faced declining crude production for several years and is focussed on prolonging output at current levels rather than trying to boost production, according to risk consultants Eurasia Group.

The Al-Shaheen oilfield is located 80 km off Qatar's coast and currently produces around 300,000 bpd (Photo: Mint Foto/Fotolia)

Saudi Aramco consolidates its position in global energy markets

SAUDI ARAMCO'S LATEST Annual Review, titled *Energy is Opportunity*, highlighted the company's key results and accomplishments in 2015

Minister of energy, industry and mineral resources and chairman of the board of directors of Saudi Aramco Khalid Al-Falih said that, despite the low oil price environment, in 2015 Saudi Aramco delivered another record year of crude oil and gas production, as well as making significant progress in its domestic and international downstream expansion. The minister stressed that these results, delivered through focused operational efficiency and fiscal discipline, have consolidated Saudi Arabia's position in international energy markets.

Saudi Aramco president and CEO Amin H Nasser said that in 2015 Saudi Aramco recorded its highest level of crude oil production, brought on-stream major value-addition projects in both upstream and downstream, and opened two new research centres in Beijing and Detroit.

In 2015, Saudi Aramco produced an average of 10.2 mn bpd of crude oil and processed raw gas at an average of 11.6bn scfd, two all-time records. Its share of refining capacity stood at 3.1mn bpd.

In addition, with new refineries going online, exports of petroleum products increased by 38 per cent, thus maximising the value of hydrocarbons. Saudi Aramco's averaged 7.1mn bpd, up from around 6.8 million bpd in 2014. The company's exports to major markets increased substantially during the period from 2014 to the end of 2015, with exports to China, Japan, South Korea and India grew by 4.5 per cent, 2.8 per cent, 3.5 per cent and 18 per cent respectively.

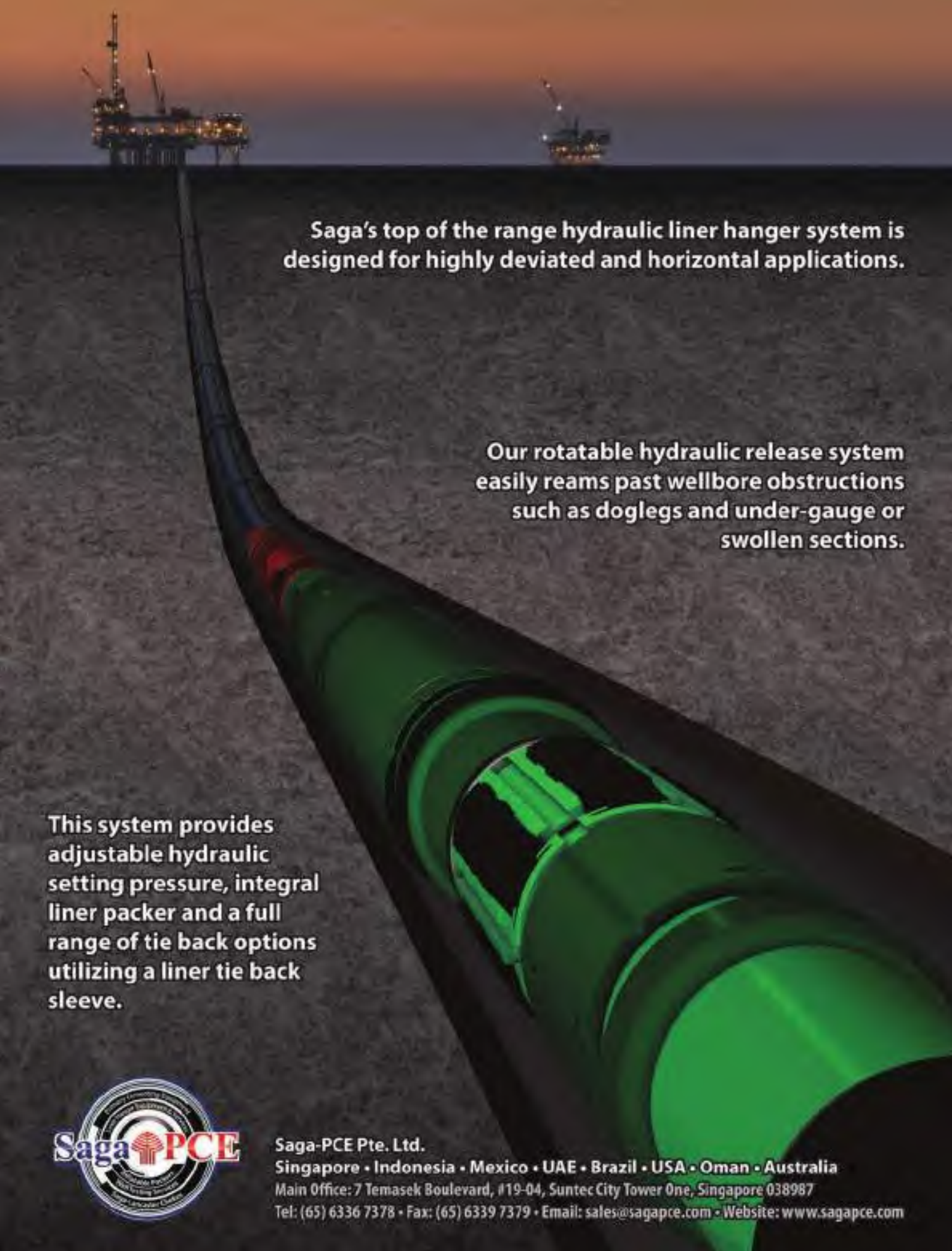
The Review mentions that Saudi Arabia discovered three new oilfields and two new non-associated gas fields, and is moving ahead with its programme to explore for gas in the Red Sea and unconventional gas.

The Review highlights that in 2015 the company's plan to integrate its refining network with chemicals production and associated value parks reached a major milestone with the startup of the Sadara Chemical Company. In addition, the SATORP and YASREF joint venture refineries came fully on-stream and the Jazan Refinery and Terminal projects are well underway. The expansion of Petro Rabigh, the integrated refining and petrochemical venture with Sumitomo Chemical of Japan, was steadily advanced toward its startup in 2016.

The publication also highlights Saudi Aramco's In-Kingdom Total Value Add (IKTVA) initiative that is designed to double the percentage of locally produced energy-related goods and services contracted by the company to 70 per cent.

In a recent interview with Reuters, Nasser said that Saudi Aramco is gaining market share and pushing for greater efficiency, as it acts as a "bridge" to a future when the nation relies less on energy exports. Nasser also said that the company was pressing on with preparations for its partial privatisation via a stock market listing, which he said lay at the heart of Riyadh's "Vision 2030", a long-term economic plan headed by Deputy Crown Prince Mohammed bin Salman to reduce the country's dependence on oil.

Saudi Aramco is making significant progress in domestic and international downstream expansion (Photo: Željko Radojko/Fotolia)



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Next five years will reshape global gas trade, says IEA

Growth is expected in LNG supplies despite weak gas demand and low prices (Photo: leungchopan/Fotolia)

THE INTERNATIONAL ENERGY Agency (IEA) believes the next five years will see major shifts in the reshaping of the global gas trade. In its 2016 *Medium-Term Gas Market Report*, it also indicated that global gas trade patterns are shifting as new LNG supplies are coming online, just as demand growth in some major markets weakens. This also implies a weaker position for Japan and Korea who are the world's top two LNG buyers, thus furthering chances of finding demand in other markets like China, India and ASEAN countries.

IEA executive director Fatih Birol said, "We see massive quantities of LNG exports coming on line while, despite lower gas prices, demand continues to soften in traditional markets. These contradictory trends will both impact trade and keep spot gas prices under pressure." Dr. Birol added that the combined factors of cheaper coal and continued strong renewables growth were blocking gas from expanding more rapidly in the power sector.

The annual IEA report also provided a detailed analysis and five-year projections of natural gas demand, supply and trade developments. It has predicted the global demand to rise by 1.5 per cent per year by the end of the forecast period, compared to 2 per cent projected in last year's outlook. Slower primary energy demand growth and the decline in the energy intensity of the world economy are lessening demand growth for all fossil fuels, including gas. Even as demand growth for coal and oil weakens, the share of gas in the energy mix is still expected to increase moderately by 2021.

While gas demand is projected to remain weak, global LNG exports are expected to increase substantially. Between 2015 and 2021, liquefaction capacity is likely to increase by 45 per cent, mostly from the USA and Australia, according to the report. By 2021, Australia will rival Qatar as the world's largest LNG exporter, and the USA will not be far behind.

Fundamental developments point to oversupply in the market over the forecast horizon of this report which should keep spot gas prices across the globe under pressure – 'unwanted' LNG supplies will look for a home in Europe, due to the flexibility of its gas system and well-developed spot markets. As a result, intense competition will develop among producers to retain or gain access to European customers. "We are at the start of a new chapter in European gas markets," Dr. Birol said.

He also warned that today's oversupply could foreshadow a number of supply-side challenges and security risks down the road, noting that a growing level of LNG export capacity had gone offline during the past five years due to technical and security issues and that such problems could get worse with low oil and gas prices. As producers slash investments to refocus on cost reductions and budget savings, he said that such efforts may be too late for global gas markets to rebalance during this decade, but could sow the seeds for tighter markets into the next decade.

OPEC output down - but Middle East production rises

OPEC crude output dropped by 110,000 bpd in May to 32.61mn bpd as deepening outages in Nigeria outweighed significantly higher production from Kuwait, Iran and the UAE, according to the IEA's June monthly oil market report. Force majeure on four key export grades cut Nigerian supply by 250,000 bpd to 1.37mn bpd - the lowest in nearly three decades. Power cuts in southern Iraq reduced flows by 90,000 bpd, while a marketing dispute in Libya clipped production by 80,000 bpd. Kuwait posted the biggest increase, with supplies rebounding by 120,000 bpd following a short-lived workers' strike in mid-April. Output from Iran, OPEC's biggest source of 2016 growth, rose by 80,000 bpd to reach 3.64mn bpd - a level last pumped in June 2011 before the imposition of more rigorous sanctions. Iranian crude oil exports in May rose by more than 130,000 bpd to 2.1mn bpd - just a little below pre-sanctions rates. Supply from the UAE climbed by 70,000 bpd after oilfields returned from scheduled maintenance. Saudi production edged up to 10.25mn bpd. Production from OPEC during June could climb towards, and possibly exceed, the 33mn bpd mark, says the IEA, were Iraqi and Libyan supplies to increase and if Saudi output rises to cover the requirements of peak summer demand.

According to the IEA, Iranian output rose by 80,000 bpd in May (Photo: zhu difeng/Fotolia)

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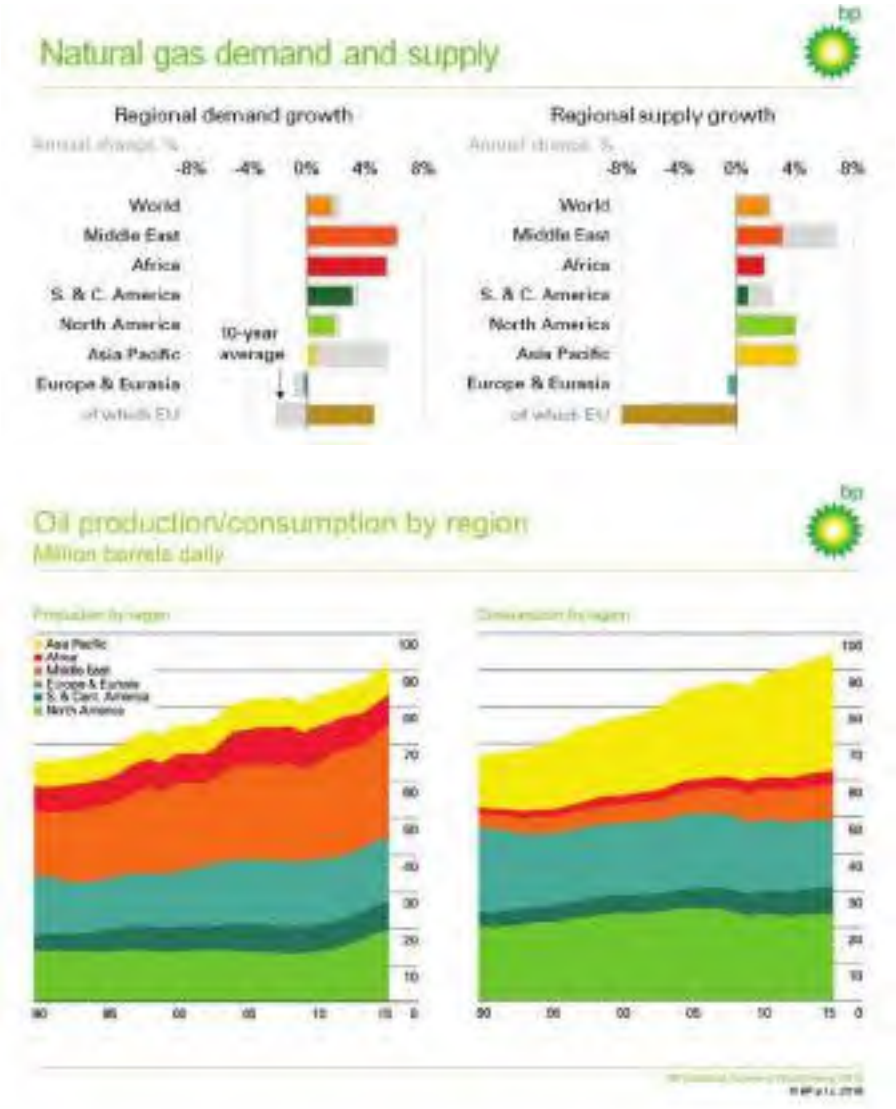
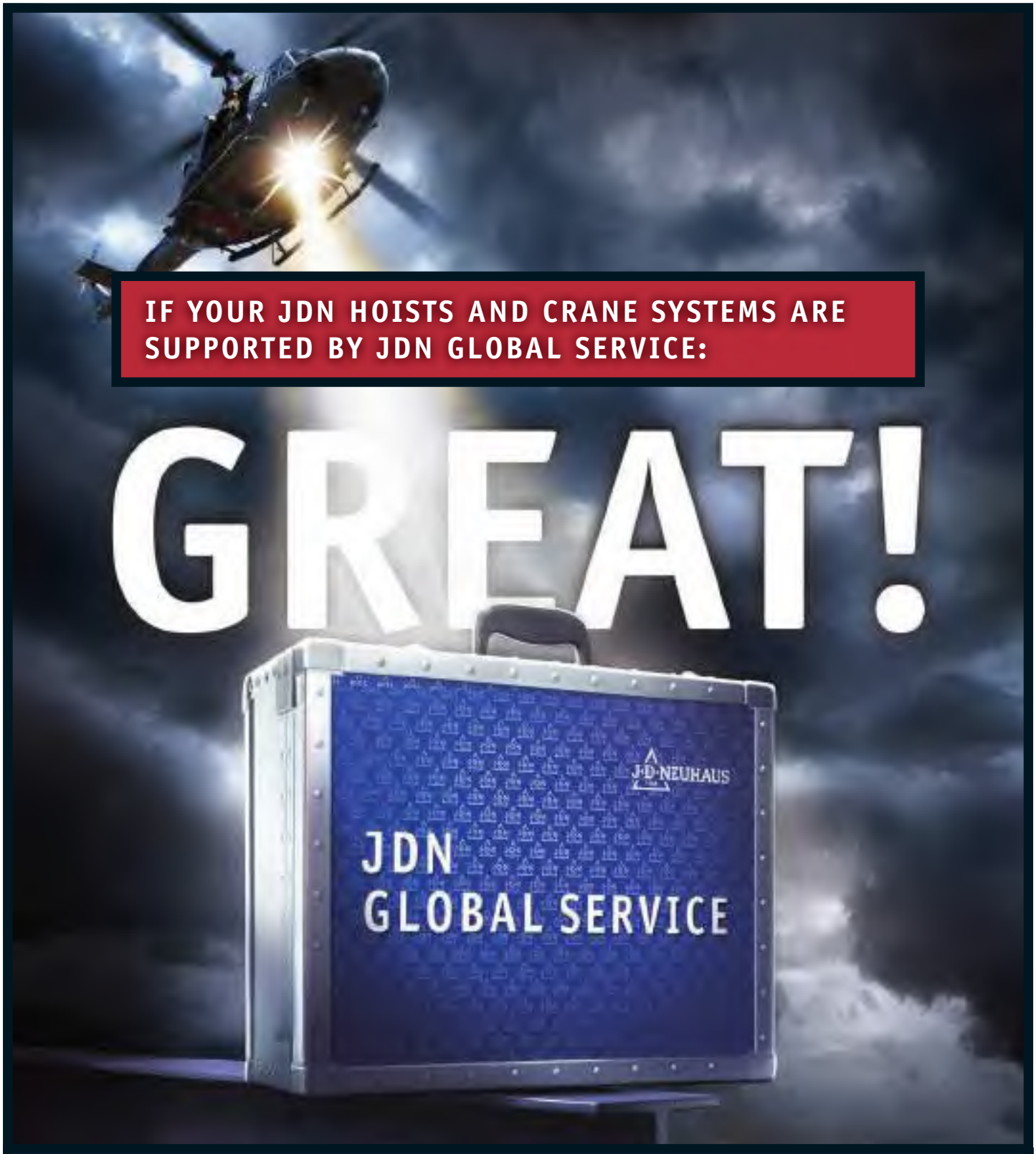
Middle East 2015 - record oil production

BP's latest *Statistical Review of World Energy* reveals that energy consumption in the Middle East grew at the fastest rate of any region, with natural gas now the dominant fuel, while oil production in the region reached a record high for the second consecutive year.

The key points of the review are as follows:

- Middle East energy consumption increased by 4.2 per cent in 2015, slightly below its 10-year average (+4.5 per cent) but faster than all other regions.
- Oil consumption rose by 220,000 bpd, or 2.1 per cent. Growth was driven by Saudi Arabia and the UAE, with demand in Iran declining.
- Almost half of primary energy consumption in the Middle East was sourced from natural gas; its share rose from 48.9 per cent in 2014 to 49.9 per cent in 2015, overtaking oil.
- Natural gas consumption rose by 29 bcm to 490 bcm at a rate of 6.2 per cent, slightly higher than the 10-year average (+5.8 per cent). Iran contributed the most to growth.
- Electricity generation grew by a below-average 3.5 per cent but still much faster than GDP (+1.6 per cent).
- Energy intensity (the amount of energy required per unit of GDP) rose by 2.6 per cent to a new high. In comparison, global intensity fell by 2.0 per cent.
- Over the past 10 years, energy intensity in the Middle East has risen at 0.9 per cent per annum, while global intensity has fallen at 1.6 per cent per annum.
- Oil production in the Middle East rose by 1.5 mn bpd to a new high of 30.1mn bpd. Iraq (+750,000 bpd) and Saudi Arabia (+510,000 bpd) provided the largest contributions to growth. Iraqi production reached a record high of four million bpd.
- Crude oil exports from the region rose by 560,000 bpd (3.2 per cent), driven mainly by Iraq. Product exports increased by 120,000 bpd (4.2 per cent) as Saudi Arabia and the UAE ramped up refinery production.
- The Middle East made up 44 per cent of all inter-regional crude oil exports and 14 per cent of oil products.
- Over 75 per cent of Middle Eastern oil exports headed to Asia Pacific, although Europe did increase its oil imports from the region by 590,000 bpd (mainly crude oil from Iraq).
- Natural gas production rose by only 3.1 per cent. Production in Yemen fell by 71.5 per cent as conflict in the country disrupted supplies.
- The loss of Yemeni production also hit regional gas exports (pipeline and LNG), which fell 5.7 bcm or 3.6 per cent. Qatar remained the largest LNG exporter at 106 bcm – almost a third of global LNG exports. ■





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BP and Eni make another gas discovery offshore Egypt

BP EGYPT AND Eni have announced another important gas discovery in the Baltim South Development Lease in the East Nile Delta, offshore Egypt.

The Baltim SW-1 exploration well, drilled in water depth of 25 metres by operator IEOC (Eni), reached a total depth of 3,750m depth and penetrated approximately 62 metres of net gas pay in high quality Messinian sandstones. The discovery, which is located 12 km from shoreline, is a new accumulation along the same trend of the Nooros field discovered in July 2015, which is currently producing 65,000 boe/d. Further appraisal activities will be required to underpin the full resource potential of the discovery.

Eni said that the Baltim South West discovery, further confirms the significant potential of the so called "Great Nooros Area", which is now estimated to hold 70-80bn cubic metres of gas in place.

Hesham Mekawi, Regional President of BP North Africa, commented, "We are pleased with the results of the Baltim SW-1 well as it is the third discovery along the Nooros trend and confirms the great potential of the Messinian play and its significant upside in the area. Our plan is to utilise existing infrastructure which will accelerate the development of the discovery, and expedite early production start-up. This announcement is another example of BP's commitment to unlock resources in order to bring critical gas production to Egypt."

BP holds a 50 per cent stake in the Baltim South Development lease, and Eni, through its subsidiary IEOC, holds the remaining 50 per cent. The well was drilled by Petrobel, a joint venture between IEOC and the state partner Egyptian General Petroleum Corporation (EGPC).

BP is one of the largest foreign investors in Egypt with investments of approximately US$30bn. The company has made a series of discoveries in Egypt in recent years including Taurt North, Seth South and Salmon and Rahamat, Satis, Hodoa, Notus, Salamat and Atoll. B

There have been a number of recent finds offshore Egypt (Photo: pichitstocker/Fotolia)

Eni has been present in Egypt since 1954, where it operates through IEOC Production BV. The equity production in the country in 2015 was 200,000 boe/d.

The discovery is the latest in a number of major finds offshore Egypt, the most significant being the Zohr 'supergiant' oilfield discovered by Eni, the largest known gas field in Egypt and the Mediterranean, which is predicted to hold 849.5bn cu/m of gas, covering an area of around 100 sq km. According to Adam Pollard, analyst at energy consultancy Wood Mackenzie, the development is being fast-tracked in phases, with phase 1 due to come onstream late-2017 and production set to ramp up to around 2.7 bcf/d by 2019.

It is hoped that the exploitation of recent discoveries will play a significant role in meeting Egypt's growing gas demand, which currently outpaces its production, necessitating the import of LNG since April 2015.

"This will have a huge, positive impact on the economy, as it will offset the more expensive gas Egypt is buying in," said Pollard. It is reported that the Egyptian Natural Gas Holding Company (EGAS) is contracted to import 80 LNG shipments to the value of US$2.3-3bn in 2016.

Sectors such as power generation, cement, and fertilisers, which have suffered from gas shortages in the past, are all likely to benefit, added Pollard.

Egypt's major offshore oifields (Source: Wood Mackenzie)

‘Dare to go there’; experts urge new businesses to invest in Iran

WITH THE LIFTING of sanctions on 17 January 2016, Iran suddenly became the most sought-after market from being the toughest to enter. A decade of sanctions and isolation has crippled the Middle East nation’s economy, and now the OPEC member and major oil producer wants to get back on the progress track.

With the signing of Joint Comprehensive Plan of Action (JCPOA) in July last year with United Nations and European Union to eliminate/limit stockpiles of uranium, Iran has also likely rolled back its steps on nuclear activities.

In May 2016, the Future Energy Forum (FEF) held the inaugural Iran Club connecting businesses and legal experts to give their insights into investments in post-sanctions Iran.

Christos Charalambous, senior associate at Taylor Wessing, said, “Iran is a significant player in the global oil and gas market and a valued member of OPEC. With an open market now, the world is looking at Iran with opportunities.”

However, Charalambous also said that although sanctions are lifted, there are a lot of restrictions on how the USA and its companies trade with Iran on a commercial level. Europe, on the other hand, looks ready with Italy recently signing potential billions of dollars deals for infrastructure. Going forward, he has advised new companies to look at experienced companies in Iran for expertise, but also to be cautious.

Robin Mills, CEO of Qamar Energy, voiced similar concerns. Talking about the oil and gas sector, he revealed that since the sanctions have been lifted, there has been a significant rise in Iranian oil exports. “On a good day, the production output hits 2.2mn bpd. However, the real picture will be seen once the crude reserves are drained in a few months.”

Mills also talked about Iranian Petroleum Contract, which is still being revised to suit the present circumstances. “So far the contract is reasonable, but foreign companies will only sign if it suits them.”

With Iran keen to boost technologies and innovations, Mills revealed Iran’s energy investment plan over the next decade to be US$500bn. However, this may be a huge task in the times of lower oil prices than anticipated. He also advised that Iran being an attractive market has many companies flocking to it, but it needs to be seen how many will actually be able to push their way ahead. “You need to be cautious and patient. It will pay off.”

According to Mazdak Rafaty, managing partner at Ludwar International Consulting, Iran is now looking to rebuild its economy. So any foreign investors should also think about how to pump money into the domestic market rather than just profiting from the what the country has to give. “Iran is hungry for innovations and commitment. Anybody who gives it that will be successful in the market. Think about a win-win situation for both sides.”

Iraq - growing production **against the odds**

The *Iraq Petroleum 2016* conference, which took place in May in London, discussed the challenges and opportunities of doing business in Iraq's oil, gas and petrochemicals sector.

IT HAS NOT been an easy year for Iraq. Political infighting, social unrest, the presence of Isis in the north and west of the country and the failure of Erbil and Baghdad to reach agreement on exports and revenues are just some of the issues the country is having to contend with. While the struggle against Isis and reduced oil revenues arising from lower oil prices have strained the country's finances to breaking point, leaving the government struggling to pay the oil companies their dues and requiring them to make cutbacks.

And yet, as delegates at the *Iraq Petroleum 2016* conference held in London in May heard, Iraq's production is holding up remarkably well given the challenging environment.

Dr Falah Alamri, director general of the State Organization for Marketing Oil (SOMO) at Iraq's Ministry of Oil, said that Iraq is currently capable of producing 4.7mn bpd, with the Kurdistan Region producing 500,000-525,000 bpd, although power outages in Basra have contributed to a slow-down in exports in May.

Dr Alamri highlighted in particular the need to expand refinery capacity, noting that the country currently imports around 30-35 per cent of its petroleum product requirements.

There is no doubt that serious challenges need to be addressed to attract the further investment that the country so desperately needs if it is to have any hope of achieving its production target of 5.5-6mn bpd by 2020, a target considered over-ambitious by many, despite the fact that the country sits on some of the lowest cost and easy to access oil resources in the world, the bulk of which are concentrated in the relatively secure Basra province in the south.

Andrea Leadsom MP, Minister of State at the UK's Department of Energy and Climate Change (DECC), highlighted the "huge" potential of Iraq's energy sector, the key role Iraq plays in global energy security and the UK's willingness to strengthen its partnership with Iraq to develop its energy sector, pointing out that BP is looking to triple production in southern Iraq. Further investment is required but good economic management is needed to give the IOCs confidence, she commented.

HE Mohammed Sahib Al Daraji, Iraq's Minister of Industry & Minerals, addressing the conference

> "We have the cow, but unfortunately we are buying milk from our neighbours."

"We need confidence in the business and security environment," she said, urging Iraq to continue to strengthen the business environment, its institutions and the rule of law.

HE Dr Salih Hussein Ali, Iraq's ambassador to the UK, stressed the efforts of the Abadi government to improve the business environment, noting that it is working with international organisations to develop economic zones and stamp out corruption. He highlighted the government's commitment to paying the IOCs as a condition of its agreement with the IMF.

HE Mohammed Sahib Al Daraji, Iraqi Minister of Industry and Minerals, highlighted the need to encourage sectors such as manufacturing, saying "We cannot survive on less than US$65 per barrel… we must benefit from this crisis to liberate our economy from its oil dependency."

The solution lies with the private sector, he said, calling for foreign investment in private/public partnerships.

"We have a number of state-owned enterprises manufacturing items such as pipes who are interested in working with international companies to develop their facilities." Iraq is looking for private partners and investors to run the existing petrochemicals facility in Basra, he added.

Working with the IOCs is key, he said. "Iraq needs more refineries and to be able to deal with associated gas more efficiently. We have the cow, but unfortunately we are buying milk from our neighbours. We should work with the IOCs to make an energy city or energy hub in Basra, develop the areas around the oilfields sustainably and enhance local living conditions," he said, urging the IOCs to do more to use local contractors and build local capacity. ■

Shell looks to step up local content

SPEAKING AT *IRAQ Petroleum 2016*, Marcus Antonini, vice president and country chairman, Shell Iraq, highlighted the company's efforts to further boost local content. "Iraq is a country with a long tradition of producing oil and gas and a lot of know-how; to integrate this knowhow into our operations is key for us to be cost-efficient, and to be adapted to the local environment," he said. "In all our projects there is a real opportunity on local content. The big success stories over the last four or five years have been with smaller companies. We have transport companies which started with 20 vehicles and now have 120 vehicles, which started with 25 people and now have 120 people – all working to international standards." Shell is now looking to intensify co-operation with larger Iraqi entities, he told the conference.

Shell has cut the number of expatriate staff at the Majnoon oilfield by around 50 per cent, which has reduced operating costs without impacting production, said Antonini. "It is also a development journey, we have spent around one million man hours on training Iraqi personnel throughout the project," he remarked. The company plans to replace a further 150 operators with Iraqi staff, he added. "We're actually constrained by the number of available people." Along with efforts to reduce costs and make savings by doing things smarter, this would provide a huge opportunity to make the project even more sustainable, he commented.

Antonini said that Shell intends to start drilling again at Majnoon, which is currently producing around 220,000 bpd. "We have made a lot of progress in the last couple of months to make this possible. We have a number of wells we can still hook up in Majnoon and great cooperation with the Southern Oil Company to do this."

Shell is also looking to further reduce gas flaring at the oilfield, currently standing at 40 per cent, and send this gas to the Basra Gas Company for processing. The Basra Gas Company (BCG), Shell's joint venture with Mitsubishi and South Gas Company, which collects and processes gas from three oilfields, is a "real success story", said Antonini, and has doubled production within three years to the current level of around 630-650 scf/d, with the aim of reaching 700 scf/d by the end of the year. This provides electricity for Basra and around 60 per cent of the country's LPG requirements, with the prospect of the commencement of LPG exports.

The planned Nebras petrochemicals project is closely linked to the success of BGC, Antonini remarked. "Every scf we add to the production of the BGC provides a more stable feedstock for a petrochemical plant. Our goals is to establish all the ingredients for an investment decision as soon possible." Efforts are currently focused on the cost efficiency of the design.

Antonini also acknowledged the government's efforts to honour its payment commitments to the IOCs. "We are cost current in 2015 for BGC and are expecting improved payment for 2016 – all the indications are that this is going to happen."

Maintaining the right gas leak detection strategy

Pipeline operators should focus on maintenance, modelling and detection to prevent large leaks down the road, says Lars Larsson, Schneider Electric.

WHILE LEAK DETECTION guidelines have been established for liquid transmission pipelines for a long time, the guidelines or standards for leak detection on gas pipelines are few and typically company specific. The methodologies and tools that can be implemented on liquid pipelines with a high degree of success do not work nearly as well for gas transmission pipelines because of the physical state of gas and the operational philosophy of the gas pipeline.

This presents a large challenge to an industry where failing pipeline integrity can affect the planet and the lives of those who inhabit it, not to mention the company's bottom line. Leak detection is key in preventing disasters, both environmental and human, from occurring, as well as preventing loss.

When gas leaks from a pipeline, the natural gas either dissipates directly into the atmosphere or ignites, creating a fire that could potentially have grave consequences. Natural gas is compressible, and hydraulics in the gas pipeline might make the leak close to invisible for the pipeline controller in the control room. These conditions and others make it much more difficult to detect a leak because the most typical indicators – visual detection, pipeline pressure fluctuation and volume differential – are extremely difficult to perceive on a gas pipeline, and the strategies to do so are different from a liquid pipeline.

The key to preventing a leak in a gas pipeline is the same as for a liquid pipeline, and is that the physical pipeline, its equipment, and instrumentation has an integrity management program (IMP) in place making sure that the whole infrastructure is maintained and kept in good working order.

Middle East pipeline status

The pipeline network in the Middle East is a complex spider web of connected lines. Its complexity adds layers of difficulty to integrity management for both liquid and gas pipelines. For a region whose economy is heavily dependent on oil and gas revenues, this is an important challenge to manage.

The Middle East is home to a complex network of pipelines (Photo: hdemestier/Fotolia)

> "The pipeline network in the Middle East is a complex spider web of connected lines."

The good news is that the systems and industry guidelines for liquid leak detection and prevention are advanced, and advancing more every day. Similar guidelines for gas pipelines are currently missing, however it is expected that guidelines for prevention and detection of leaks on gas pipelines will materialise sooner rather than later.

However, the foundation of strong gas transmission leak detection is an accurate hydraulic model of the pipeline, and this is where many Middle East pipeline companies can make improvements. To sustain an accurate hydraulic model that can support advanced leak detection systems, sufficient and ongoing maintenance of the pipeline and the model is needed. Many companies in the Middle East have the capital to install leak detection systems as part of a CAPEX investment, but do not have the OPEX budget to keep the leak detection system working successfully after initial installation.

This means that the company feels the technology or leak detection system has failed, and they replace it with a new system covered by another CAPEX investment. This is expensive, time consuming and not always needed.

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While many pipeline monitoring solution providers and leak detection vendors might try to convince you otherwise, it can be significantly more effective and cost efficient to focus on regular maintenance rather than regular system overhaul. It is important to recognise that even state-of-the-art equipment requires maintenance, or it loses value the moment it is placed in the ground. The current lack of maintenance presents a huge potential problem to an industry that is in great need of better leak detection.

The important role of the real time transient model

The real time transient model provides an accurate picture of the hydraulics appearing in the gas transmission pipeline, especially due to the gas pipeline typically not being operated in a steady state manner. A good hydraulic model is necessary for leak detection systems to work well, but as it is based on the virtual pipeline design and telemetry data, it becomes less accurate as the nature of the pipeline changes.

Just as for liquid pipelines, gas pipelines are affected by normal wear and tear, deposits building up inside the pipeline, equipment degrading and possibly even changing operating conditions. If these changes are not introduced on the real time transient model as well, then any applications building on the output of the hydraulic model would suffer, including leak detection.

The hydraulic model uses software to create a virtual model of what is happening inside the pipelines, as opposed to a system that would only report information such as the schematics of pressure readings at specific mile markers seen in SCADA.

Failing to keep the physical pipeline maintained as close to its original condition as possible, as well as not re-calibrating the hydraulic model to reflect any changes over time, makes the model all but useless in the accurate depiction of pipeline flow conditions. This is critical, as the hydraulic model feeds critical add-on modules such as leak detection that provide controllers with advanced tools to prevent and detect leaks.

Gas vs. liquid

Gas pipelines respond in fundamentally different ways to integrity breaches than liquid pipelines, because gas is not only highly compressible, but also a diffuse substance. These two factors make it entirely possible that, short of a major disaster, a gas leak could go undetected indefinitely.

In the case of a liquid pipeline, even with no leak detection methods utilised by the operator, someone will eventually realise there is an integrity issue.. At some point there will be a realisation that less product is getting delivered than was shipped. Even if that isn't picked up, a leak will eventually be seen by a passer-by.

Proper maintenance allows a business to detect leaks and act on them to prevent environmental and economic loss (Photo: berkut_34/Fotolia)

> "The Middle East has important advantages over other regions."

Gas is compacted in a pipeline for transportation, so when the receiver draws product from the pipe they receive it instantaneously, with no easy volume-in/volume-out calculation to make. Additionally, because gas is diffused, gas packed into one point of the pipeline may likely not be affected by an integrity breach at another point. Finally, except for specific conditions, leaking gas dissipates into the atmosphere and, unless identified by special optical monitors, is difficult to visibly catch unless it ignites and burns.

Detecting a gas leak requires a more complex set of flow monitoring solutions to observe and identify the cause of anomalies in the pipeline. The hydraulic model uses existing telemetry and determines what is working, what is not working, and the amount of gas being packed into the pipeline. If there is a leak, the hydraulic model helps the operator distinguish when, where and how big it is, or if that leak is in fact just a broken piece of equipment that requires maintenance.

Balancing leak detection and business efficiency

While this might all be distressing to pipeline operators looking for cost-effective integrity management for their gas pipelines, the Middle East has important advantages over other regions.

First, its pipelines are relatively short to medium in length and run over a condensed area, making maintenance and inspection practical and efficient. Operators in the Middle East have the capacity to physically inspect and maintain pipelines for significantly less expense than in other regions such as Russia, which has long gas transmission pipelines running across its vast landscape, and where unmetered locations can take gas for long periods of time without the pipeline company noticing.

Second, because the environmental and regulatory implications of a minor gas leak are significantly less than a liquid leak, gas pipeline operators have greater flexibility to balance their risk tolerance for an undetected leak against the cost of detection strategies. An operator's risk tolerance should determine not only the complexity of the leak detection solutions

but also the maintenance plan employed to maintain it. For example, if an operator is willing to tolerate a small amount of throughput loss in a remote area where the risk of impact to the environment or people is low, they can consider implementing a less sophisticated leak detection system that requires less maintenance and upkeep for that section of the pipeline. The operator can then focus their resources on high consequence areas such as under rivers or populated areas, and augment the standard leak detection or model-based leak detection with a secondary and more dedicated leak detection system. This focuses a company's resources on the highest risk areas where the most loss could be incurred, while still keeping an eye on the big picture.

Any maintenance is better than no maintenance, even at a lower level. It is important for pipeline operators to note that if they do choose to employ a lower maintenance strategy, they have to accept the fact that they will be less able to identify leaks that occur.

High maintenance is the necessary strategy for pipelines with a low risk tolerance. Proper maintenance allows a business to detect leaks and act on them to prevent environmental and economic loss, as well as create a detection plan to work off of as time goes on. When anomalies show up they should be promptly investigated and maintained. Using the hydraulic model, a pipeline controller is able to better understand if the abnormal pressure reading is caused by a deposit build up, equipment failures, or if the pipeline in fact has a pipeline integrity issue.

Maintenance requires manpower. For the pipeline to run smoothly, workers dedicated to leak detection at particular locations are vital. They get to know the software and the individual pipelines, so when something goes wrong they notice and take immediate action before a small problem can grow into a larger issue. There are even companies now that can be contracted to provide physical and software maintenance.

> "High maintenance is the necessary strategy for pipelines with a low risk tolerance."

Taking on the gas leak detection challenge

From a business standpoint, a gas leak could be incredibly costly. The company could lose tens to hundreds of thousands of dollars in lost product if there is a minor or even a moderate leak. It may have little environmental impact, but it will be costly if it goes undetected for a few days before a pipeline controller notices they are not getting the amount of gas out of the pipeline that they were expecting.

While gas pipeline leak detection seems daunting, it is not something to be feared if proper maintenance is performed on the gas pipeline network. Implementing a hydraulic model significantly improves the chances of detecting leaks, while giving additional benefits in other types of gas applications; this, paired with a high level of maintenance, provides companies with peace of mind.

The main goal of pipeline maintenance, modelllng, and detection is to avoid large leaks down the road. The effort put into balancing these factors from a pipeline integrity point of view from the beginning, will continue to pay off long into the future. ■

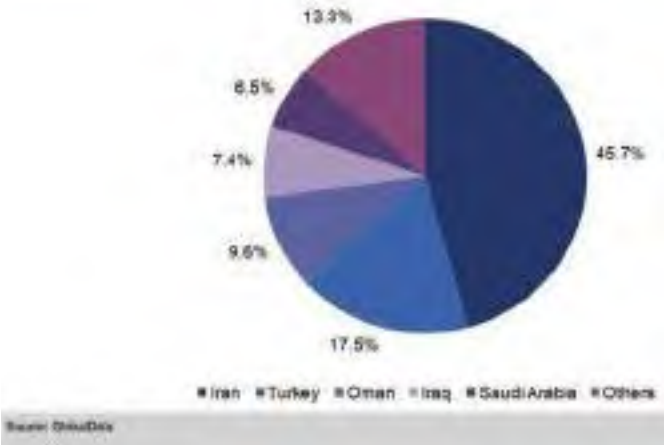
Middle East pipeline capex to top US$28bn in 2016

US$28.2BN IS DUE to be spent on pipelines in the Middle East in 2016, with a further US26.3bn in 2017, according to GlobalData's report *Oil and Gas Pipelines Industry Outlook in the Middle East to 2020* (http://energy.globaldata.com/). However this figure is set to fall sharply from 2018 as capital expenditure cuts bite. According to the report, there are 43 planned pipelines in the Middle East, with a total length of 3,789 km. Iraq is the country with the longest planned crude oil pipelines network, while Iran has the longest planned gas pipelines network, and Oman has the longest planned NGL pipelines network.
There are 353 active pipelines in the Middle East, with a total length of 24,523.2 km. Saudi Arabia has the longest active crude oil pipelines network, while Iran has the longest active natural gas pipelines network.

Oil and Gas Pipelines Industry, Middle East, Active Key Statistics, March 2016	
Number of active pipelines in the Middle East	353
Total length of active crude oil pipelines in km	24,523.2
Total length of active petroleum products pipelines in km	16,028.5
Total length of active natural gas pipelines in km	37,146.2
Country with longest active crude oil pipelines network	Saudi Arabia
Country with longest active petroleum products pipelines network	Iran
Country with longest active natural gas pipelines network	Iran

Oil and Gas Pipelines Industry, Middle East, Planned Key Statistics, 2016–2020	
Number of planned pipelines (including stalled pipelines) in the Middle East	43
Total length of planned crude oil pipelines (including stalled pipelines) in km	3,789.0
Total length of planned petroleum products pipelines (including stalled pipelines) in km	3,408.0
Total length of planned natural gas pipelines (including stalled pipelines) in km	20,689.5
Total length of planned NGL pipelines (including stalled pipelines) in km	300.0
Country with longest planned crude oil pipelines network	Iraq
Country with longest planned petroleum products pipelines network	Iran
Country with longest planned natural gas pipelines network	Iran
Country with longest planned NGL pipelines network	Oman

Oil and Gas Pipelines Industry, Middle East, Natural Gas Pipeline Length by Top 5 Countries (%), March 2016



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Inter-state pipeline prospects

MANY ISSUES NEED to be addressed for gas pipelines to operate effectively in the Middle East, said Dr Naji Abi-Aad, COO at Beirut-based Petroleb, speaking at the Oil & Gas Security conference in London. These include the extreme differences of electricity and consequently gas demand between winter and summer, the need for ample supplies of attractively priced gas, transit fees and issues, security issues, and the desire of Middle East countries for energy independence and self-sufficiency. Competitive costs of liquefaction and the flexibility of import have led to many countries favouring the LNG option, despite the availability of gas in neighbouring countries, with Kuwait and Dubai already operating LNG terminals and other countries looking to do so. Only a few inter-state gas pipeines have been built in the Middle East, the one major success being the Dolphin pipeline which brings Qatari gas to the UAE. A pipeline has been constructed to bring Iranian gas to Iraq, but is reported to be currently on hold due to difficulties in Iraq.

As for oil pipelines, the major interstate pipeline planned is a pipeline from Basra in Iraq to Aqaba in Jordan, which could also provide Iraqi oil for Egyptian refineries. Iraq's oil ministry is reported to have received a bid from a Jordanian-Chinese consortium to build the pipeline.

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A new concept for well intervention

Dan Purkis, technology director at Well-SENSE Technology, outlines a gamechanging technology for well intervention which is being developed in collaboration with the Aberdeen-based Oil & Gas Innovation Centre and Robert Gordon University (RGU).

IN ORDER TO achieve optimum production, operators need to continually monitor, maintain and repair oil and gas wells. In the current climate, when drilling and completing new wells is often cost prohibitive, it is a vital part of the production process and precisely when operators turn to intervention specialists.

The basic infrastructure of current well intervention methods – coiled tubing, electric line and slick line – were invented over 50 years ago. Each of these options require expensive, hefty equipment which not only needs significant capital investment but also many man hours to operate. Added to which, they share a common theme: the spooling in of wire or tubing from surface, which must then be retrieved.

If they cannot be retrieved and a fishing job ensues, this sort of failure can rank anywhere from very inconvenient to catastrophic to the bottom line. As a result, many potential – and even planned – intervention operations do not go ahead, as the risk is seen to outweigh the benefits. This is especially reflective of surveillance operations – particularly abandonments – where there isn't a return on the cost of performing the intervention.

Dan Purkis, technology director at Well-SENSE Technology

With the exception of tractors, which are an enhancement to E-Line, no major developments – in terms of the deployment methods for intervention – have been made in the last 20 years. Carbon push rod systems have been developed recently, but they are by no means mainstream because, like the other existing methods, they are capital- and labour-intensive.

> "FLI is an entirely new technology which combines several novel concepts in a single package."

An important factor in justifying the expense and risk of any intervention operation is having sufficient data to understand the potential outcomes. In well fibre optics, utilising Distributed Acoustic Sensing (DAS), Distributed Temperature Sensing (DTS) or Distributed Pressure Sensing (DPS), are excellent ways of getting lots of key data to base important decisions on. However, the cost of permanently or temporarily installing these is also cost prohibitive in all but a small number of wells.

A new concept

As a provider of bespoke engineering services, Well-SENSE is creating solutions to lower the cost of well intervention and data collection. It was by using a non-oilfield approach and considering how technology giants like Google and Apple would troubleshoot these problems, that FibreLine Intervention (FLI) was born.

FLI is an entirely new technology which combines several novel concepts in a single package and represents a radical advance for the downhole tool business. By replacing the tool infrastructure with a compact, low cost and disposable alternative, many of the cost and risk factors in well intervention are overcome.

In its most basic form, FLI is a means of temporarily installing fibre optic lines into wells for the purpose of performing DAS, DTS or DPS.

By increasing the number of fibre optic lines installed in wells, the collection of well data will dramatically rise, resulting in a greater understanding of the performance and integrity of wells, thus presenting many more opportunities for production enhancement and well integrity operations, whilst lowering cost and risk profiles.

In an ideal world, operators would perform a micro-seismic survey on each fracturing operation to gain a real time understanding of the fracture efficiency. Installing geophones in nearby wells, to listen and create a visual image of the fracture within is a very costly process which involves shutting in wells and installing and retrieving geophones.

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Current well intervention methods are costly and labour intensive (Photo: Farmer/Fotolia)

The alternative to running geophones is to install a fibre optic line and perform the micro-seismic survey using DAS. Unfortunately, the current methods available to introduce fibre optics into a well are also cost prohibitive. Installing fibre optics using FLI technology significantly reduces this problem, as well as the associated risk, to the point where micro-seismic surveys could be run on all wells.

FLI is a compact, cost efficient and disposable system and minimises the amount of surface equipment, personnel and time associated with typical intervention operations.

The potential

Fibre optics and DAS surveys are just the first steps in this new intervention discipline, of which collaboration is at the heart.

Working together is the way forward, not just in the development of FLI, but for the industry in general. The scope for FLI applications is so vast, that for it to make the biggest impact, it will require other specialist companies from the wider industry to develop technology to compliment it. Ultimately, it's a platform from which multiple new generations of increasingly sophisticated intervention tools can be launched.

> "Working together is the way forward, not just in the development of FLI, but for the industry in general."

Further advancements to FLI will present the opportunity of performing other common well intervention operations like logging, perforating and directional surveys, to name a few. The cost effective design of FLI will allow a much faster product development cycle. In the same way that smartphones are continuously upgraded and replaced by a newer version, the disposable nature of FLI will allow for regular upgrades of the technology; thus the oilfield can benefit from rapid technology advancements made in other industries.

It's a time for open minds and forward thinking. Intervention methods, as we know them, may become the dinosaur technologies of the past. With the commercialisation of inventions like FLI, they might just become extinct. ■

Dan Purkis has been instrumental in bringing a number of new technologies to market, including the world's first intelligent completion. He holds over 50 granted patents and was recently presented with the Significant Contribution award at the 2016 Offshore Achievement Awards.

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NOV announces technology advancement in the lifecycle management of wellbore products

NATIONAL OILWELL VARCO (NOV) has introduced an advancement in Radio Frequency Identification (RFID) technology and asset management software for the oil and gas industry.

NOV's latest generation RFID tag, TracTag™, has been field-proven to withstand extreme drilling conditions when installed on drillstring components. The tag is currently the only RFID technology in the industry that can survive extreme downhole temperatures of -40°C to +200°C (-58°F to +400°F) and up to 1550 Bar (22'500 PSI) of pressure, says NOV.

The company has been a leader in using RFID for asset management on existing surface-based products and services; however, the technology behind TracTag has overcome the challenges associated with harsh downhole well conditions and can now be incorporated into NOV downhole products.

The company has also introduced an asset management software, TracAsset™, and an automated pipe tally system with a wellsite tag reader, AutoTally™. The combined system will enable greater capabilities for delivering reliable information and analysis to customers.

The TracTag™ can withstand extreme drilling conditions (Photo: Tim Evanson/Flickr)

Clay C. Williams, chairman, president and CEO of National Oilwell Varco, stated, "We continue to invest in new technologies that drive our industry forward and help our customers improve effective asset utilisation and reliability while decreasing their costs. The data we will be able to obtain from these innovative technologies will play a critical role in shaping the future development of drillstring components and tools."

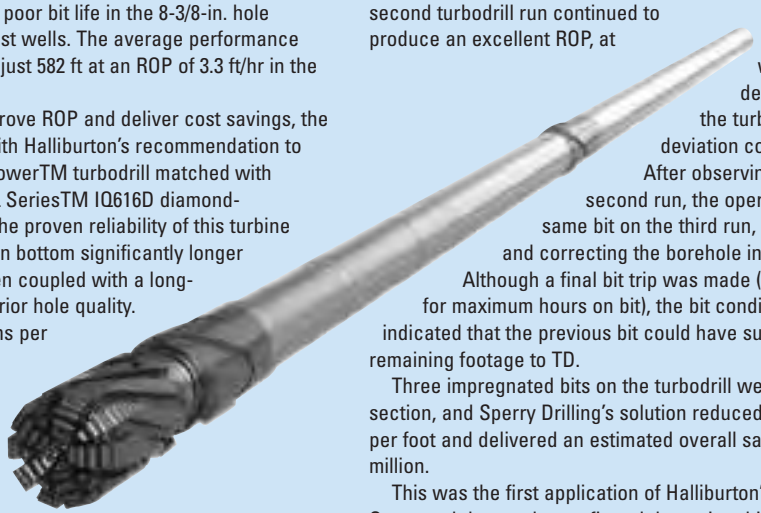
NOV will be able to provide an entire lifecycle management solution for drillstring components that includes information regarding original manufacturing specifications, inspection and repair history, along with usage details. The TracTag and AutoTally system will make it possible to read tags as drillstring components pass through the rig floor; and integration of the system into the rig control system will provide drilling hours and critical drilling information down to the serial number of the component

Turbopower™ turbodrill saves operator US$3 million in exploration well offshore Qatar

HALLIBURTON DRILLING TECHNOLOGY has resulted in significant savings for a major operator on a complex well offshore Qatar, says the company.

Initial runs for a major operator offshore Qatar using polycrystalline-diamond-compact (PDC) bits driven by drillstring rotation were resulting in slow rates of penetration (ROPs) and poor bit life in the 8-3/8-in. hole section of one of the country's deepest wells. The average performance from six PDC bit runs had resulted in just 582 ft at an ROP of 3.3 ft/hr in the harsh Pre-Khuff formations.

Needing a solution that would improve ROP and deliver cost savings, the operator decided to move forward with Halliburton's recommendation to use a Sperry Drilling 6-3/4-in. TurbopowerTM turbodrill matched with Halliburton Drill Bits and Services' IQ SeriesTM IQ616D diamond-impregnated bit to drill the section. The proven reliability of this turbine technology allows the bit to remain on bottom significantly longer than other drilling methods; and, when coupled with a long-gauge bit, the turbine produces superior hole quality. The high power output and revolutions per minute (RPM) of the turbodrill, paired with a diamond-impregnated bit, proved to be the optimal solution for drilling this hard formation. The remaining 1,492 ft of the section was drilled to total depth (TD) over the course of four runs, utilizing three bits at an average ROP of 7.1 ft/hr.



The Halliburton Turbopower™ turbodrill

The first run with the Turbopower turbodrill and IQ616D bit provided significant ROP and improved bit life. The resulting hole quality was excellent, convincing the operator that there was little risk in running logging-while-drilling (LWD) operations, which had previously been avoided due to hole concerns. Following a round trip for LWD, the second turbodrill run continued to produce an excellent ROP, at which time the operator decided to make a trip to adjust the turbodrill bend setting for deviation control.

After observing minimal bit wear after the second run, the operator decided to rerun the same bit on the third run, drilling an additional 500 ft and correcting the borehole inclination back to vertical.

Although a final bit trip was made (following the operator's policy for maximum hours on bit), the bit conditions observed on surface indicated that the previous bit could have successfully drilled the remaining footage to TD.

Three impregnated bits on the turbodrill were used to complete the section, and Sperry Drilling's solution reduced the operator's drilling cost per foot and delivered an estimated overall savings of more than US$3 million.

This was the first application of Halliburton's Turbopower turbodrills in Qatar, and the results confirmed that using this solution to drill these hard formations can be an economical approach with no compromise to safety, steerability, or hole quality.

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Addressing the demand for the toughest tablets

Tablets are part of many people's everyday technology toolkit. But if you work in an area where explosions are even a remote possibility, a consumer tablet is out of the question. Vaughan O'Grady discusses specially designed tablets for hazardous areas – and the standards they must meet.

YOU CAN NOW find smartphones, laptops, notebook computers, PDAs, and of course tablets, in ruggedised form – that is, toughened to withstand greater levels of vibration, heat, cold and water than consumer items, as well as dropping from greater heights. A small but significant number of devices, however, are also certified for use in potentially explosive areas.

The need certainly exists. David Krebs, executive vice president, Enterprise Mobility & Connected Devices with M2M market intelligence and advisory firm VDC Research, cites "the efficiencies implied by a shift from manual/paper-based to automated mobile processes, and the growing demand/opportunity to replace the radio and clipboard with a single integrated solution".

Tablets in particular are attractive to a number of industries. As Kevin Boyd, vice president, Business Development at Ecom instruments, a leader in mobile explosion protection, says, a tablet in particular has the right size of screen to show, say, diagrams, videos or SCADA applications (unlike a PDA or smartphone), but is also more portable than a laptop – which is important if you happen to be carrying it long distances. "A lot of the people who use these devices have to walk for miles around a plant – and downstairs, and up and down ladders," Boyd points out.

But worker safety is a critical issue, so until recently the use of devices that could in any way pose a risk in hazardous environments was hard to justify. However, says Krebs, "through greater availability of modern mobile devices designed to be intrinsically safe or non-incendive, these barriers are gradually being overcome".

Intrinsically safe is in fact a defined concept, as Boyd knows only too well. "For over 30 years," he says, "Ecom has applied explosion protection methods to a wide range of rugged industrial portable devices to allow them to be used safely in harsh and hazardous environments where explosive gas or dust may be present." This protection is designed to prevent an explosion initiated by hot surfaces, sparks, arcs, electrostatic discharges and even, says Boyd, "things like barcode readers and scanners… a lot of people don't realise that these emit a certain amount of optical energy".

There is a growing market in the oil and gas industry for ruggedised tablets and tablets certified for use in potentially explosive areas (Photo: ake1150/Fotolia)

> "A lot of the people who use these devices have to walk for miles around a plant."

Among these protection methods is 'intrinsic safety'. Boyd explains, "In this method the electrical circuit parameters are reliably controlled under potential fault conditions to limit potential spark energy to below that which will ignite the explosive gas or dust."

However, he adds, most smartphones and tablets cannot meet the requirements of intrinsic safety without a redesign of part or all of the device. "This is one reason why simply putting a consumer device in a case cannot be classed as Intrinsically Safe. If only it was that easy! Equipment protected in this way must be physically marked with 'Exic', 'Exib' or 'Exia'. If it is not marked in this way, it is not intrinsically safe."

Related standards

There are related standards, of course. The two main standards are ATEX (Appareils

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destinés à être utilisés en Atmosphères Explosibles), legally binding in the EU, and the voluntary but more internationally applied IECEx - (International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres). Both standards offer frameworks defining the standards for both the classification of the various potential explosive atmospheres and the types of equipment and protective systems used within them.

And such standards are driving a small but significant market selling intrinsically safe devices into industries like offshore oil and gas, onshore pipelines, aviation (notably where fuel is involved), chemicals, refineries, mining, defence and emergency services (when dealing with gas leaks, chemical spills or fuel spillage, for example).

Just to complicate matters, however, there is no single safety level for ATEX or IECEx. In hazardous environments that require specialty devices, there exists a variety of different classifications and device types. However, for tablets the main classification to note is Zone 2 (gases, vapours) in Europe, or Class 1, Division 2 in North America.

Class 1 refers to gases, Division 2 refers to areas where hazards are not expected except in the case of a malfunction. Zone Two (gases, vapours) is described as "an area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time".

These areas may not be dangerous most of the time, but they still require intrinsically safe or non-incendive equipment. As for what you have to guarantee, Maurice Powney, certification manager SGS Baseefa, a leading internationally recognised certification body for explosion protected equipment, explains that zone two protection certification will often involve "enclosure protection with a few restrictions on the electrical circuits." He continues: "Plastic enclosures would be subject to thermal endurance to heat (typically 28 days at 80˚C, 90% RH), then cold (24hrs at typically -25˚C), then subject to impact test (2 x 7J impact) and drop test, also at -25˚C, and then IP54 tests. The electrical circuits have to have no sparking contacts and operate at voltages below 60V." It is possible to choose a certification that does not rely on enclosure protection, but the ignition capability of arcs and sparks and hot surfaces will always be assessed.

Rewarding market

It's a small market but, if your equipment meets the requirements, a rewarding one (these devices don't come cheap), where you'll find familiar names, like Panasonic, and less familiar ones, like Getac, Xplore and Ecom, offering specially designed tablets.

Panasonic has Toughpad, a ruggedised range that includes a number of hazardous area devices, such as the Panasonic Toughpad FZ-G1 ATEX tablet. "To secure the certification," says Jonathan Tucker, European product marketing manager, Computer Product Solutions (CPS), Panasonic, "Panasonic developed a special battery design for the ATEX version of the tablet and incorporated the device in a purpose-built leather case. With this device," he adds, "the oil and gas industry and other sectors sensitive to potential gas explosions have access to a rugged Windows tablet that is ATEX-certified for use by mobile workers for the first time."

Ecom's Tab-Ex 01 combines all three of the key certifications (ATEX Zone1, IECEx Zone1, Class1 Division1) in the same device (Photo: Ecom)

> "Even though Zone 2 is the least hazardous of the hazardous certifications, it remains demanding."

Even though Zone 2 is the least hazardous of the hazardous certifications, it remains demanding. Peter Molyneux, president of rugged computing specialist Getac, explains, "Zone 2 is generally so many metres away from any refining or wellhead where the atmosphere is very combustible. But it's still quite a difficult standard in that you have to make sure that the device is shielded, and that the device can't emit a spark, be it static or anything else. And also that if you were to drop it or hit it with a metal object, you're not going to get a spark of any type. And you also need, electronically speaking, to tie down the battery – because there's power in the battery, and that's a potential risk as well."

Also, you don't want to keep swapping devices, which is why Xplore Technologies, a specialist in ruggedised tablets, offers a number of ATEX-certified tablet PCs 'out of the box'. "So," says Sandy McCaskie, director of sales for UK & MEA, "whether you use it on an oil rig or in the consumer's home fixing their washing machine it's the same device." There's a good reason for this flexibility. "The mobile worker is not always working in an ATEX environment. Having a drive device that's ATEX compliant from the start removes the potential risk of the wrong device being used in the wrong area."

But if you think Zone 2 certification is difficult, then the safety requirements of Zone 1 – or Class 1, Division 1 – referring to areas where hazards may sometimes be present, have until recently been too demanding for most tablet manufacturers.

Powney explains, "There are a number of problematic areas – notably types of batteries (high surface temperatures on short-circuit), power demand (high power availability can cause problems with component surface temperatures), high value capacitors and the LED/LCD display (internal-external voltage enhancement)."

And yet a tablet – the first of its kind – has been developed for Zone 1 by Ecom in collaboration with Samsung. It is called the TabEx 01. As Boyd explains, it wasn't just a matter of meeting safety requirements. Ecom also had to take into account customer needs, which were: take a branded rugged tablet and make it suitable for safe use in hazardous areas; ensure software developed for the rugged tablet will run unchanged on the Zone2/Div2(DZ2) and Zone1/Div1(DZ1) tablets too; and aim for a DZ1 tablet price close to the price of some non-protected rugged tablets.

> "Designing and building a tablet for Zone 0 is probably impossible."

Boyd continues, "The difference between Zone 1 and Zone 2 is that Zone 2 really only considers the normal operating conditions of the device – the tablet, the smartphone – as defined by the manufacturer. Zone 1 also has to consider what are classified as countable faults, such as a short circuit of electrical components or batteries or things like that – things that might happen during the life of the equipment. Zone 1 tests and assessments take those kinds of things into account. Zone 2 doesn't."

Not surprisingly, then, developing the TabEx 01 involved what Boyd calls "a number of different techniques which had never been tried before for this – and which are now patented by Ecom".

Beyond Zone 1, there is Zone 0, defined, says Powney, as an area "where the potentially explosive gas and air mixture occurs in normal operation. There are electronic devices that are installed in Zone 0, but they are typically fixed equipment and monitor process variables."

Designing and building a tablet for Zone 0 is probably impossible. However, the Zone 2 and now Zone 1 tablet markets will probably keep specialist providers busy for some time. In fact, tablet use may be levelling out among consumers, but the hazardous area version will continue to be popular in a number of major industries for a very simple reason. As Boyd puts it, "It enables people to do things now that they weren't able to do before." ■

Optimising the value of **big data**

Frederick Stubbins, project consultant at Intertek Production Support, examines the benefits of unlocking the full potential of big data analytics in the oil and gas industry.

BIG DATA ANALYTICS is a hot topic, with industries from banking to pharmaceuticals only just beginning to consider the potential of the value locked in their data. The oil and gas industry in particular generates and handles large amounts of process data, but there is still a way to go until its potential is fully realised and applied to improve productivity and day-to-day processes.

For many years, data historians have worked to collect measurements from instrumentation involved in oil and gas processes globally. This data typically comes in large quantities, is complex and features many interactions and correlations between variables which are not easily interpreted.

What is big data?

Big data is a collection of information gathered through various means which is so large and complex that significant benefits can only be extracted through the application of computational algorithms. The exponential development of computational processing power and storage is the key driving force behind the wider application of big data analytics.

Contained within large historical datasets is valuable information and knowledge that, when coupled with domain expertise, can be used to achieve a variety of benefits including more efficient maintenance scheduling, improved performance, reduced downtime and maximised margins.

However, this valuable information is hidden in the quantity of data and further compounded by dataset issues such as the noise from unrepresentative operation, i.e. process upsets and malfunctioning instrumentation, etc. To simplify analytics, operators usually focus on time-series trending and first-order effects.

> “This valuable information is hidden in the quantity of data and further compounded by dataset issues.”

To give an example from a refinery, the flow rate of a fraction from a crude distillation unit (CDU) is a function of many operating parameters such as reflux ratios, reboiler heat load and the temperature of the feed entering the column. These are all examples of first-order effects on fractions.

However, there are other factors affecting this, such as the efficiency of the desalter or the temperature of the blend prior to entering the preheat train. These would not necessarily be linked to flow rate and quality of fractions. These would, however, both have an effect on the CDU heat network and, in turn, the composition and flow rate of the fractions.

> “Uncovering underlying trends and correlations allows operators to gain maximum value from their datasets.”

To promote efficiency, it is necessary to automate the process to monitor the performance of every process unit through the combinatorial analysis of all key instrumentation measurements. To give an example of a recent project we encountered, one dataset contained measurements from over 150 process sensors. Taking the data every two minutes over two months gives 43,000 time periods and therefore 6.5 million data points. This illustrates the need to reduce the complexity of large datasets into easy-to-visualise trends and correlations which focus on the key parameters adding value to the process.

Data purification

To maximise value from data, it is vital to understand outliers and ‘clean’ the dataset before moving forward to any additional analyses such as process modelling and optimisation. Data purification can be a lengthy process and, in our experience, a large portion of all big data analytics activities is around screening and pre-processing the data to ensure conclusions are valid.

We approach this by using in-house proprietary software (currently named PT5Process) to undertake big data analytics activities. PT5Process allows the user to look at the data and visualise features such as missing data, constant values, faulty sensors and questionable values.

PT5Process plots can be used to identify process outliers by looking at combinations of process variables and latent variables. Any questionable data is highlighted and assessed against underlying trends and effects.

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Figure 1

Operating regions

A key piece of information for any process plant is to have an in-depth understanding of the operating regions of the plant. Operating regions are drawn from snapshots of the combinations of operating variables at a particular time horizon and once identified, these can be correlated to key process variables.

Figure 1 shows data from a refinery that was assumed to be in 'steady operation.' However, the above data shows that this plant has transitioned through at least five different operating regions, caused by a number of process nuances such as small changes in process unit efficiency, shift changes and changing crude blend composition.

Figure 2

Importantly, each region corresponds to a different overall operating profit for the refinery. These regions give the operator invaluable information to show where the process should be positioned to meet objective functions. This information can be used to inform plans that reduce downtime, lower energy usage and heighten the flow rate of desirable fractions.

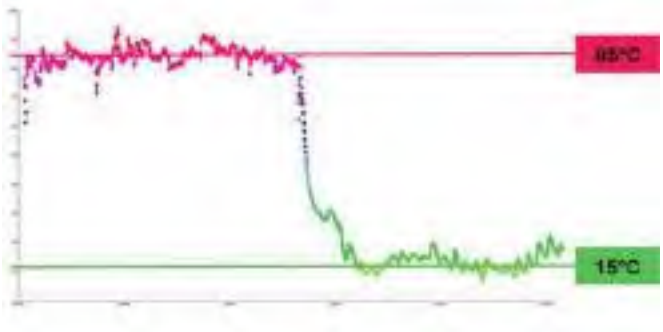

Figure 3

Once the operating regions have been identified, it is important to understand the underlying reasons for these transitions.

Figure 2 shows the transition from a lower margin operating region (red) to a higher margin operating region (green).

This transition corresponds with the switchover of parallel heat exchangers for maintenance and the subsequent improved heat transfer from a clean heat exchanger. It also demonstrates how this data analysis can be applied to monitor fouling rate and decreasing process unit efficiency (see Figure 3).

Key process variables

PT5Process has the capability to break down and interpret the underlying trends in the process data which cause features such as operating regions and determine the key instruments which have the largest impact. We do this by analysing not just the most obvious (first-order) relationships, but also other relationships caused by combinations of variables.

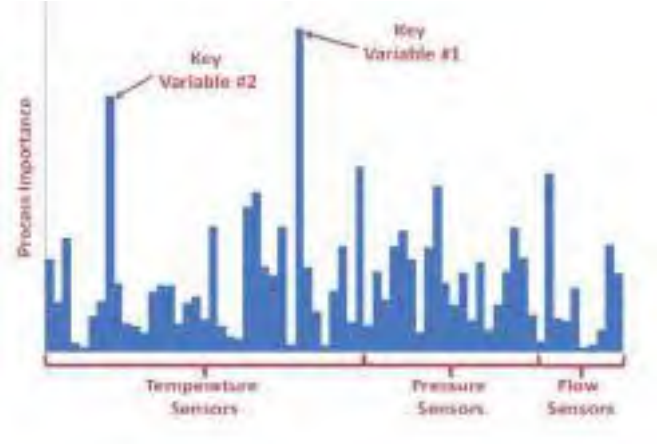

Figure 4

To improve the analytical performance, PT5Process selects target functions based on client requirements. Some previous objective functions have been to maximise flow-rate of selected fractions, optimum levels of certain crudes in a blend while minimising heat exchanger fouling, vibration monitoring and reducing maintenance costs.

To give an example, Figure 4 identifies the most important variables affecting an operating region with the objective function of maximising refinery medium gas oil (MGO) fraction. Using this analysis in conjunction with domain expertise allows us to recommend mitigation strategies to clients.

Using data analytics to optimise processes

Using advanced analytics to expose the underlying structure of complex datasets enables them to be broken down and the valuable information within them extracted. Additionally, uncovering underlying trends and correlations allows operators to gain maximum value from their datasets.

It is critical to analyse datasets as a whole, rather than focusing only on simple first-order relationships. Examining the more detailed effects, such as those caused by combinations of many different variables and of process units on plant operation, is key to unlocking the potential uses of large datasets.

Taking these points into account can give operators a much greater understanding of their processes and a means to consider how to maximise operational performance. Furthermore, the effective use of the data analysis tools at their disposal can help operators mitigate future problems such as shutdown, deferment and other issues that could negatively impact productivity. ■

Experts' opinion: Oil market is rebalancing itself

With oil prices hovering around US$50 and crude being stockpiled, the demand for storage is rising.

Producers are tapping storage rather than new loadings (Photo: stockphoto mania/Fotolia)

ACCORDING TO A recent International Energy Agency (IEA) report, floating storage on a global basis has jumped 19.5 per cent from Q1 2015 to Q1 2016.

Reuters has reported that oil traders from Houston to the North Sea are tapping into plentiful storage onshore and offshore, showing little sign of concern yet about mammoth supply losses from Canada to Nigeria that have knocked out around two million bpd of output recently.

In its June monthly report, the IEA notes that crude oil prices rallied to a 2016 high above US$51/bbl in June, stoked by continuing outages in Nigeria and Canada as well as a steady decline in US oil production. It expects the market to balance in the second half of the year, although it notes there are large volumes of shut-in production that could return to the market, and there is an enormous inventory overhang to clear.

While oil stocks are expected to witness a drastic slide in the second half of the year, for now, there continues to be a strong demand for storage until the market settles down.

Meanwhile, in the UAE, Singapore-based energy trader and oil infrastructure developer Concord Energy is set to build a second oil terminal in Fujairah, the second-largest bunkering hub in the world after Singapore.

The group will start engineering, procurement and construction works for the crude oil and petroleum products terminal in October. Financial close for the investment is also expected at the end of Q3 2016.

The commissioning date is planned for mid-2018, and the terminal is expected to be the only large-scale facility coming on stream in the period until then.

The Concord Oil Terminal will have around 400,000 cu/m of crude tanks connected to a jetty deep enough for very large crude carriers, with flow rates of 12,000 cu/m an hour. It will also have about 700,000 cu/m of gasoil, gasoline and fuel oil tanks.

At the recently held Tank World Expo 2016, Energy Aspects' chief oil analyst Amrita Sen suggested that non-OPEC supply outside the USA could become a swing factor later this year.

"In terms of oil prices, we are started to see supply fall quite sharply because of low oil prices and the 2014 crash. Because of that, we have started to see quite a significant impact on storage. The main reason for that is the capex cut as the oil and gas companies are cutting drilling. Similarly, in other parts of the world like Asia, which is a very important market for the UAE, China is leading the front on dropping supply by around 700,000 bpd year-on-year in 2015.

"One of the things we do see is that if there is going to be a supply gap in the coming years, then Middle East is going to fill it. We have seen a 50 per cent cut in capex expenditure in the USA, but in the Middle East it is just nine per cent. It is quite reasonable to believe that in five years' time, the Middle East will regain its market share."

Sen added that since Middle East countries like Saudi Arabia, Kuwait, UAE and Iraq are low-cost producers, the region still has the biggest advantage when it come to oil production.

She also optimistically commented that oil prices have been recovered from the earlier US$22 to around US$50 today. "We may even see it hit US$60, simply because the supply side has started to react. But it is going to be a slow process. Companies still need to see US$70 to US$75 to restart or take up new projects. Saudi Arabia is the only exception apart from Iran that has been

investing in its upstream, mainly because it sees a need for its oil."

At the event, oil experts also revealed that they are now seeing the oil market rebalancing, financial pressures rising rapidly, subsidy reforms happening in the Middle East (UAE has been very proactive in that) and according to them, it is a step in the right direction. "We need subsidy reforms to stop crude oil prices from dropping much further," was the general consensus.

Sen noted that the market has also started to see the supply go down a bit. "As the supply decline accelerates, you are going to see a price spike in the coming years," she noted.

> "According to Energy Aspects' Amrita Sen, since Middle East countries like Saudi Arabia, Kuwait, UAE and Iraq are low-cost producers, the region still has the biggest advantage when it comes to oil production.

Tank World Expo rebranded

StocExpo Middle East Africa (formerly Tank World Expo), has under gone a rebrand in order to align itself with Easyfairs' current portfolio of tank storage events and to capitalise on the reputation of the StocExpo brand within the sector. The event will take place at the Dubai World Trade Centre on 26-27 April 2017.

Nick Powell, event manager of Easyfairs' Tank Storage portfolio explains the reasons behind the rebrand. "I am thrilled to announce that Tank World Expo will now be called StocExpo Middle East Africa," he says. "The Middle East and African storage sector is experiencing exponential growth at the moment, and it doesn't look like it will be slowing down any time soon, which is fantastic for us and those working within it. We already attract the best and brightest from the tank storage world, but we have big plans for this show and growth is firmly on our agenda. It is great that our portfolio of events, which is spread across the key bulk liquid storage hubs of Rotterdam, Antwerp, Singapore, Dubai, Hamburg and Shanghai, is universally recognised, and launching StocExpo Middle East Africa was key to our growth. These are exciting times, so stay tuned for more information." ■

Fugro opens training centre in Abu Dhabi

FUGRO, A LEADING independent provider of geo-intelligence and asset integrity solutions, has established a new branch of the Fugro Academy Training Centre in Abu Dhabi. The inauguration ceremony on 25 May was led by Mr Samir Al Gharbi, GASOS general manager.

The new Fugro Academy Training Centre comprises three training suites, an engineering workshop, a simulation suite, a seven-function manipulator trainer and offices. It also has direct access to Fugro's own quayside and equipment within the base area. Hundreds of Fugro staff from around the world, along with clients requiring specific training, are expected to visit the centre each year.

The Fugro Academy was created in 2006 as a global group-wide standardised training initiative to develop staff and support recruitment. It provides office-based and field staff with both instructor-led practical courses and online hosted e-learning modules on a variety of technical, HSE and business-related topics. To date the Fugro Academy has presented over 1,500 trainer-led courses, training more than 12,000 staff from the many countries where Fugro has a presence.

"Following the success of the Fugro Academy in Plymouth, which focuses on survey training, we decided to create a subsea training centre, to work in partnership with our UK colleagues," explains subsea division training manager, Darren Walley. "Locating the facility alongside our highly successful ROV training centre here in Abu Dhabi builds on Fugro's close ties with the United Arab Emirates and brings us the benefits associated with an abundance of local specialist personnel and equipment suppliers."

Presentation of plaque by Massimo Brebbia, Fugro Subsea MD, to Samir Al Gharbi, GASOS general manager, with Chris Blake, director FSME

Himoinsa's gas-powered rental gensets to target customers in the oil and gas sector

THE RANGE OF diesel generators available in the rental genset market has been bolstered by the latest gas-powered models introduced by Himoinsa, as the Spanish genset manufacturer looks to add customers in the oil and gas market to the list of those being targeted by its new power systems.

The HRGP 25 T5 LPG, HRGP 40 T5 LPG and HRGP 60 T5 LPG models were launched at Middle East Electricity, the international power exhibition held in Dubai earlier this year, with the gas-powered generators featuring an integrated LPG tank offering 25, 40 and 60 kVA of continuous power.

The new rental canopy version incorporates enough LPG storage for 24-hour continuous operation without refuelling, and each machine can be connected to an external tank to extend the length of its autonomous operation. Himoinsa said that gas-powered generators were an "interesting option" for rental companies looking for profitable equipment, believing that the products could help meet demands for lower emission and more flexibility to oil and gas operators. The HRGP models also guarantee low fuel costs and lower maintenance costs than diesel-powered generators.

Manuel Aguilera, gas product manager for Himoinsa, told *Oil Review Middle East*, "We are going to make some developments with different products focused on gas and the first one of these is for the rental genset market. We realised that the construction sector could be a really interesting market for these applications, and the oil and gas industry could also be interested in these gensets. In the oil and gas industry, they tend to use gas-powered gensets, but they also have LPG tanks available, and these gensets are able to utilise three different ways of feeding the tank.

"Our main target with these gensets is the rental market, but companies in this sector often target construction and oil and gas firms," Aguilera explained. He noted that the cost of LPG was cheaper than diesel and that the fact these machines have potentially lower emissions levels could help many firms meet future planned emission regulations in many parts of the world.

"The rental market for small gas gensets is still growing, but at this power level it's still quite new," he added.

The integrated tanks have been LPG-certified for vehicles, making them a versatile option for the rental sector, where there is a high demand for mobile equipment.

A competitive advantage of gas generator sets in the rental sector is the type of fuel they require to operate, with the use of gas instead of diesel solving the problem of fuel theft, which is a leading concern within the rental genset industry.

Each of the new models features a selector that enables the operator of the genset to switch between LPG and natural gas and there are three different possibilities of power supply: integrated fuel tanks or LGP or NG external supply.

Himoinsa's latest range of gas-powered generators feature an integrated LPG tank offering 25, 40 and 60 kVA of continuous power

Guided wave radar and non-contact radar:

A formidable team

Radars have revolutionised measurement for the hydrocarbons industry. Magnetrol's guide wave and non-contact radars are excellent examples of this new generation of leading-edge technology.

RADAR TECHNOLOGY HAS revolutionised level measurement in a variety of process industries since the introduction of 4-20mA loop powered, radar-based transmitters in the 1990s.

Both guided wave radar (GWR) and non-contact radar have numerous advantages over older, more established level measurement technologies.

The benefits of radar technology

The benefits of using these radar technologies versus traditional level instrumentation are myriad. It is important to understand how guided wave radar and non-contact radar can work together to provide reliable level measurement.

The Eclipse Model 706 guided wave radar

Both GWR and non-contact radar have the same general principle of operation – that is, microwave time of flight and no moving parts. Because of these two important features, users can retrofit these radar transmitters into various process applications.

Once installed, improvements in efficiency and accuracy can be quickly appreciated.

The various applications that use these technologies include: DPs, due to SG shifts, installation costs, and leak points; buoyancy, due to SG shifts, moving parts, calibration issues, and costs; RF capacitance, due to cumbersome calibration, dielectric shifts, and coating issues; and ultrasonics, due to vapour effects, turbulence and foam.

How GWR and non-contact radar technology works

With GWR technology, the waveguide becomes a probe which is immersed in either liquid or a dry, bulk media. The impedance of the probe is reduced when the higher dielectric priocess medium being measured displaces the air. The electromagnetic pulses which are transmitted down the waveguide are reflected at this point of discontinuity and the reflections are measured by high-speed circuitry in the transmitter and thus the level is established.

In regard to non-contact radar, instead of the electromagnetic pulses bieng transmitted down a waveguide, as is the case with GWR technology, the energy is transmitted directly into the vessel through the air using an antenna. However, it does share a similarity with GWR in that reflections from the surface are measured by high-speed circuitry in the transmitter in order to establish the level.

A powerful combination for modern operators

Guided wave radar and non-contact radar are related technologies, and together they are a powerful combination that can cover the majority of your continuous level control needs.

The Pulsar Model R96 non-contact radar transmitter

A very similar user interface and quick disconnect electronics means that, if an operator knows how to use one, they will then know how to use the other.

Magnetrol delivers a powerful one-two punch in leading-edge radar technology with its formidable duo made up of the Eclipse Model 706 GWR and Pulsar Model R96 non-contact radar transmitters.

These best-in-class level control solutions provide advanced measurement performance compared to traditional technologies – and competitive radar products. ■

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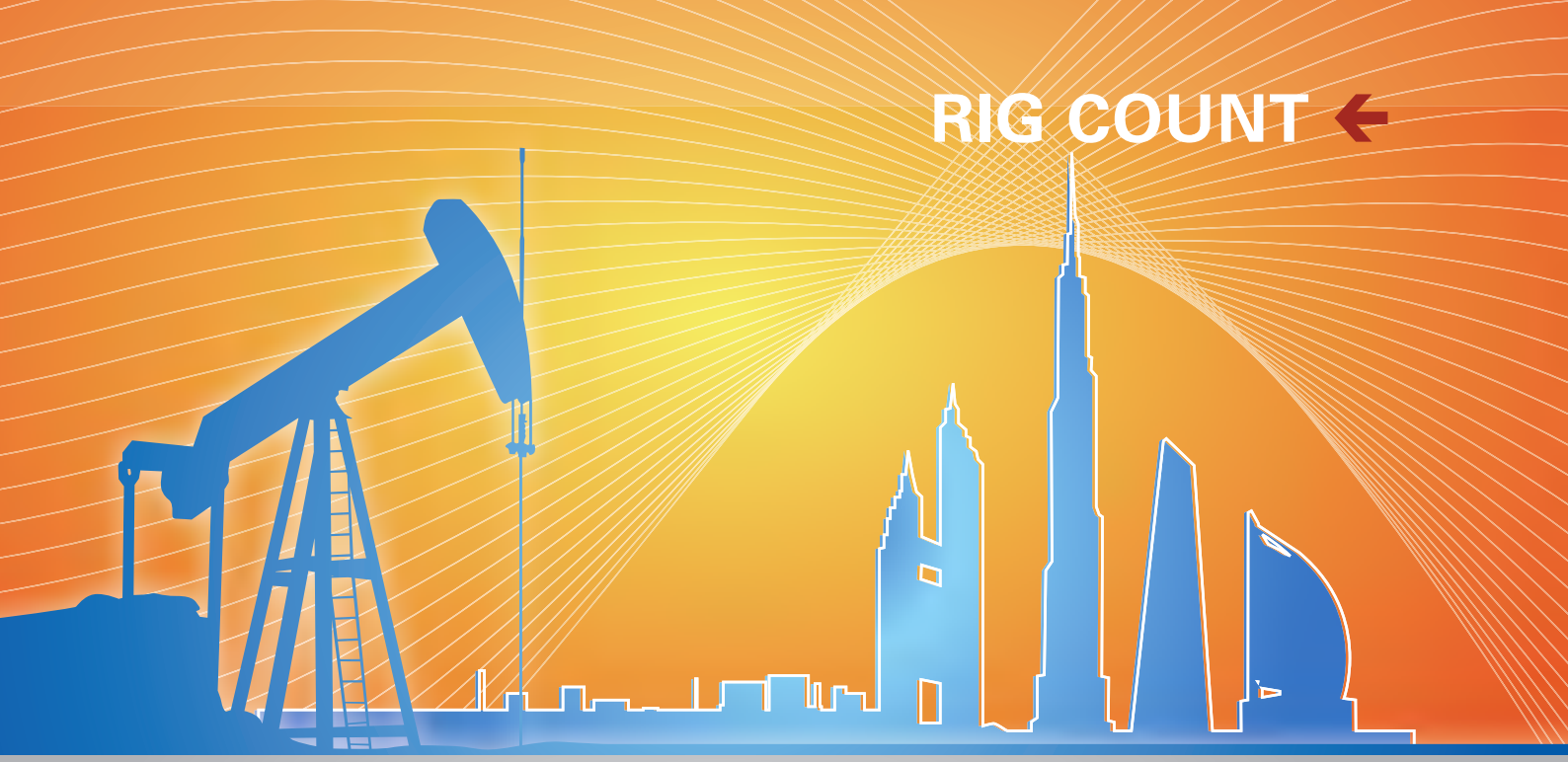

Middle East & North Africa

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.

	THIS MONTH			VARIANCE	LAST MONTH			LAST YEAR		
Country	Land	OffShore	Total	From Last Month	Land	OffShore	Total	Land	OffShore	Total
Middle East										
ABU DHABI	31	17	48	0	28	20	48	25	11	36
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	43	0	43	0	43	0	43	61	0	61
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	43	0	43	3	40	0	40	45	0	45
OMAN	69	0	69	0	69	0	69	57	0	57
PAKISTAN	27	0	27	4	23	0	23	19	0	19
QATAR	3	4	7	0	3	4	7	2	7	9
SAUDI ARABIA	105	18	123	0	103	20	123	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	0	0	0	0	0	0	0	3	0	3
TOTAL	321	41	362	7	309	46	355	309	38	347
North Africa										
ALGERIA	55	0	55	0	55	0	55	49	0	49
EGYPT	18	10	28	-2	22	8	30	46	16	52
LIBYA	0	1	1	0	0	1	1	4	3	7
TUNISIA	0	0	0	0	0	0	0	0	3	3
TOTAL	73	11	84	-2	77	9	86	102	9	111

Source: Baker Hughes

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Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS - EGYPT

Project	City	Facility	Budget ($ US)	Status
AGROCHEM - Ammonium Sulfate Plant	Alexandria	Ammonia	50,000,000	FEED
Alexandria Mineral Oils Company (AMOC) - Naptha and Diesel Units	Alexandria	Naptha	250,000,000	Feasibility Study
Amreya Petroleum Refining Company (APRC) - Crude Oil Distillation Unit	Alexandria	Crude Oil Distillation Unit	250,000,000	On Hold
AQFCIC - Misr Phosphate Company - Egypt Kuwait Holding Company - El-Wady Complex for Phosphate and Compound Fertilizers	Abu Tartor	Ammonium Phosphate	1,200,000,000	Feasibility Study
AQFCIC - Nitric Acid Plant	Ain Soukhna	Ammonia	160,000,000	EPC ITB
ASORC - Hydrocracker	Upper Egypt	Hydrocracker	1,500,000,000	Engineering & Procurement
Assiut Oil Refining Company (ASORC) - Hydrocracking Diesel Complex	Asyut	Hydrocracker	2,500,000,000	Feasibility Study
Assiut Oil Refining Company (ASORC) - Naphtha Complex	Asyut	Continuous Catalytic Cracker (CCR)	1,600,000,000	Design
Burullus Gas Company - West Nile Delta Gas Field	West Nile Delta	Gas Field	12,000,000,000	Engineering & Procurement
Burullus Gas Company - West Nile Delta Gas Field - Giza, Fayoum, and Raven Gas Fields Offshore	West Nile Delta	Gas Field Development	800,000,000	Engineering & Procurement
Burullus Gas Company - West Nile Delta Gas Field - Taurus and Libra Subsea Fields	West Nile Delta	Gas Field	550,000,000	Engineering & Procurement
Dana gas - Block 1 (North El-Salhiya)	North El-Salhiya	Gas Exploration	70,000,000	Engineering & Procurement
Dana Gas - British Petroleum (BP) - Block 3 (El-Matariya)	El-Matariya	Gas Exploration	120,000,000	Engineering & Procurement
ECHEM - Alexandria Propylene Derivatives Project	Alexandria	Propylene	2,500,000,000	Feasibility Study
Egypt Hydrocarbon Corporation (EHC) - Tahrir Petrochemicals Complex - Utilities and Offsite Facilities	Suez	Offsites & Utilities	2,000,000,000	Engineering & Procurement
Egyptian Chemical Company (KIMA) - Aswan Fertilizer Complex (KIMA 2)	Aswan	Ammonia	592,000,000	Construction
Egyptian Petrochemicals Holding Company (ECHEM) - 4th Generation Petro-refinery Complex	Ain Soukhna	Naptha	9,000,000,000	On Hold
Egyptian Petrochemicals Holding Company (ECHEM) - Aromatics & Fertilizers Complex (SUPSC Project)	Suez	Aromatics	2,044,000,000	Feasibility Study
Egyptian Petrochemicals Holding Company (ECHEM) - Bio-Ethanol from Beet Molasses Project	Kafr El Sheikh	Bio-Ethanol	135,000,000	On Hold
Egyptian Petrochemicals Holding Company (ECHEM) - Bio-Ethanol from Rice Straw Project	Kafr El Sheikh	Bio-Ethanol	227,000,000	Feasibility Study
Egyptian Petrochemicals Holding Company (ECHEM) - Formaldehyde and Derivatives Project	Kafr El Sheikh	Formaldehyde	100,000,000	Feasibility Study
Egyptian Petrochemicals Holding Company (ECHEM) - Olefin and Polyolefin Complex	Kafr El Sheikh	Polyolefins	3,000,000,000	Feasibility Study
Egyptian Styrene and Polystyrene Production Company (E-styrenics) - Styrenics and Polystyrene Plant Phase II	Alexandria	Polystyrene	460,000,000	EPC ITB
El Delta Company for Fertilizers & Chemical Industries - Dakahliya Complex - Fertilizer Complex	Talkha	Ammonia	408,000,000	Engineering & Procurement
El Nasr For Intermediate Chemicals - Phosphate and Fertilizer Complex	Ain Soukhna	Phosphoric Acid	600,000,000	Engineering & Procurement
Eni - Block 9 (North Leil Offshore)	Mediterranean Sea	Exploration	300,000,000	Engineering & Procurement
Eni - British Petroleum (BP) - Block 8 (Karawan Offshore)	Mediterranean Sea	Exploration	140,000,000	Engineering & Procurement
ENI - Nooros Exploration Prospect (Abu Madi West)	Nile Delta	Gas Field	2,000,000,000	Engineering & Procurement
Eni - South-West Melehia Block license	South-West Melehia.	Exploration	40,000,000	Engineering & Procurement
ERC - Mostorod Refinery	Mostorod	Refinery	3,700,000,000	Construction
Ethydco - Alexandria Ethylene Complex	Alexandria	Ethylene	730,000,000	Construction
Mashreq Petroleum - Tank Terminal	Port Said	Export Terminal	350,000,000	Engineering & Procurement
Middle East Oil Refinery (Midor) - Midor Refinary	Alexandria	Refinery	1,400,000,000	Engineering & Procurement
Petro Shorouk - Zohr Gas Field Development	Mediterranean Sea	Gas Field	7,000,000,000	Construction
Petromisr - Ain Al Sokhna Refinery	Ain Soukhna	Refinery	3,000,000,000	On Hold
SOPC - Oil Production Complex	Suez	Oil Production	500,000,000	Feasibility Study

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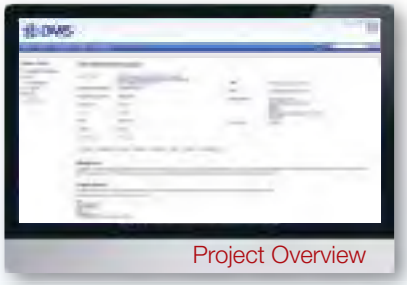
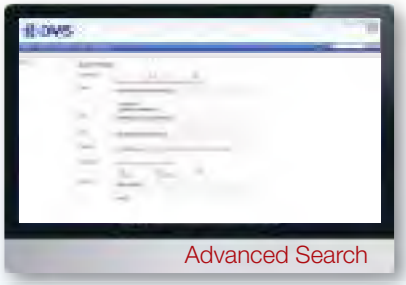
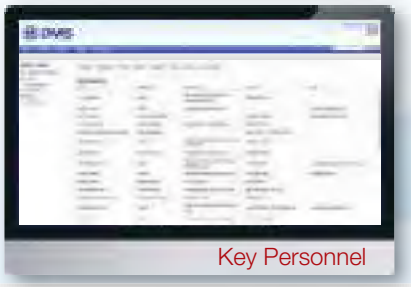


Project Overview

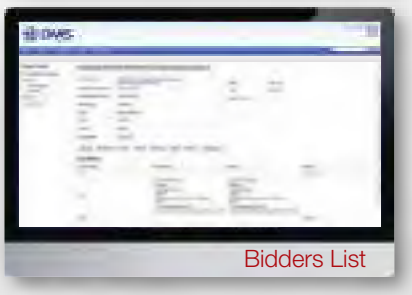


Advanced Search



Key Personnel

Market Forecast



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العمليات، وقد أهّلنا ذلك جيدا لمجابهة التحديات الراهنة.

ونحن نتبع منهجاً شاملاً يُعنى باقتناص الفرص المتاحة من جراء انخفاض أسعار النفط لرفع مستوى الكفاءات. وقد تمكنا من تقليل النفقات، المخطط لها في ٢٠١٦ بمقدار ١,٦ مليار دولار.

● **هل توجد أية أساليب معينة تركزون عليها حاليا للاستخراج المعزز للنفط؟**

●● ندير حاليا مجموعة من مشاريع الاستخراج المعزز للنفط على النطاق التجاري. وهي تشمل الاستخراج باستخدام المواد الكيميائية وحقن الغاز القابل للمزج والتطبيقات الحرارية. ونواصل، عبر مجموعة استثماراتنا، تطوير التقنيات الواعدة والمبتكرة للاستخراج المعزز للنفط عبر إجراء الاختبارات المعملية والميدانية، مثل اعتماد استخدام المذيبات والبخار شديد السخونة.

غير أننا نركز حاليا على استغلال وتعزيز فرص النفط والغاز التقليدية المتاحة بدلًا من توسعة مشروعات الاستخراج المعزز للنفط الإضافية على المدى القصير، وذلك بسبب طبيعتها التي تستهلك الكثير من الموارد وارتفاع تكلفة آليات الاستخراج الثلاثية. وقد تجاوزت المعدلات السنوية للإنتاج في حقل مرمول، خلال السنوات الثلاث الماضية، العمليات الأساسية والردم وتطوير الآبار الأفقية والغمر بالمياه التي تمت على مدار السنوات الثلاثين السابقة لها.

ونستخدم في حقل قرن العلم أسلوب التصريف الجاذبي للغاز - النفط بواسطة الحرارة (TAGOGD) - وهو لم يُستخدم من قبل قط على هذا النطاق في خزان يضم صخور الكربونات المتكسرة. وفي ذلك، يتم حقن البخار مباشرةً في التكوينات المتكسرة، وتسخين الصخور المحيطة، وخفض درجة لزوجة النفط بعامل يصل إلى ١٠٠ ضعف. ويأتي بعد ذلك دور التصريف الجاذبي، حيث يتم تصريف النفط المُحرر والمتدفق إلى آبار الإنتاج المحفورة بشكل أفقي، والتي تقع باتجاه أسفل الخزان.

وخلال شهر فبراير/شباط هذا العام، بدأنا إجراء التجارب الميدانية على البوليمرات القلوية الفعالة سطحيا (ASP) في أحد قطاعات حقل مرمول، وذلك بهدف تقليل بقايا النفط المشبعة، ورفع مستوى الاستخراج الكلي للحقل على الحقن بالبوليمر بنسبة ١٠ في المائة. وسوف يتم إجراء تحليل لأداء الطبقة الجوفية في إطار التجربة خلال هذا العام.

عوامة إرشاد جديدة في ميناء «مينا الفحل» للمساعدة في التصدير الآمن للنفط الخام

● **ما هي في رأيك الإنجازات الرئيسية لبرنامج القيمة المحلية المضافة (In-Country Value)، وما هي خططكم المستقبلية؟**

●● يظل توفير فرص العمل والتدريب للعمانيين أولوية استراتيجية لشركة تنمية نفط عمان. ومما يعود بالنفع الكبير على الأعمال، تقليل التكاليف الإضافية، والنطاقات الزمنية للعمل، والتي ترتبط غالبا بالموردين الدوليين لصالح تنمية الإمكانات وسلاسل التوريد المحلية، لا سيما في البيئة الحالية المليئة بالتحديات. وقد بلغت القيمة المحلية المضافة المقدرة لنا في العام ٢٠١٥ للسلع والخدمات، ٣٧ في المائة، وهي نسبة مرتفعة عن العديد من الدول الأخرى التي تتبع استراتيجيات تعاقدية محلية على مدار عدة عقود.

وخلال العام السابق نجحنا، بالتعاون مع مقاولينا عبر برنامج الأهداف الوطنية الخاص بنا، في توفير ٧٢٠٠ فرصة للعمل والتدريب وإعادة التوزيع للعمانيين الباحثين عن الوظائف. وكان من بين النجاحات التي تُحسب للبرنامج، تخرج ما يقرب من ٢٠٠ شاب عماني متدرب على برنامج اللحام ٦ جي، وهو أعلى معيار معتمد دوليا. وقد تم تعيين هؤلاء الشباب في مشروع رباب هرويل العملاق والمتكامل لإنتاج النفط والغاز، والذي يعد المشروع الأكبر في تاريخنا.

فضلًا عن ذلك، ننوي الاستمرار في توفير ٧ آلاف فرصة عمل سنويا، ونستهدف مجالات العمل التي تتسم بانخفاض نسبة العاملين العمانيين فيها، والتي تحظى، في الوقت ذاته، بارتفاع الطلب عليها، مثل بناء السقالات والرفع والمرافع والأعمال الكهربائية والميكانيكية وأعمال النجارة. وقد قمنا، على مدى العام السابق، باستثمار ٣,٧ مليار دولار مع شركات محلية مسجلة. ونحن فخورون للغاية بشركات المجتمع المحلي، وشركات المجتمع المحلي الكبرى (SLCC) الأربع التي قمنا بتأسيسها لتوفير خدمات حقول النفط الأساسية، والتي يعمل بها الآن ما يقرب من ٨٠٠ عماني.

خلق فرص عمل للعمانيين من أولويات شركة تنمية نفط عمان

المضي قدما بمشروعات أساسية

قال راؤول ريستوتشي، العضو المنتدب لشركة تنمية نفط عمان، في حوار أجرته معه مجلة «النشرة النفطية»، إن الشركة ستواصل، رغم انخفاض أسعار النفط، تنفيذ المشروعات بنشاط وبوتيرة سريعة. كما أنها - في الوقت نفسه - لا تألو جهدا في التحكم في التكاليف. وتحدث ريستوتشي كذلك حول مشروعات وخطط شركة النفط الوطنية. وإلى نص الحوار:

● ما هو الهدف الحالي لتطوير شركة تنمية نفط عمان؟

●● نضع مشاريعنا الرئيسية نصب أعيننا لتوفير القيمة والدعم للحكومة في مساعيها لمواجهة العجز المالي الناجم عن انهيار أسعار النفط. فضمان استدامة أعمالنا يعتبر هدفا بعيد المدى لشركة تنمية نفط عمان، غير أن البيئة المالية الحالية تؤكد أيضا على الأهمية البالغة للاستدامة في الوقت الراهن. وقد استغلت الشركة الفرصة لمواصلة تنمية الأعمال والعمل بكفاءة أكبر، مع المحافظة على التزامنا الكامل بتحقيق السلامة.

ففي العام الماضي، حققنا رقماً قياسياً جديداً في إنتاج الهيدروكربون بلغ ١,٢٩ مليون برميل يوميا من مكافئ النفط، مع تكثيف برنامجنا للتحكم في التكاليف في الوقت ذاته. ونحن على المسار الصحيح ونستهدف إنتاجاً جديداً ومستقراً للنفط يبلغ ٦٠٠ ألف برميل يوميا قبل حلول ٢٠١٩ . وقد أتاحت لنا إدارة الآبار والخزانات والمرافق على الطراز العالمي إيقاف التدهور في حقولنا القديمة، مع مواصلة تطوير مجموعة مشاريع الإنتاج والإضافة إليها.

أما فيما يتعلق بالمشروعات الفردية، فمن المقرر أن يكون مشروع مرآة في حقل أمل، والذي يجري تطويره بالتعاون مع شركة جلاس بوينت سولار، أكبر مشروع من نوعه للطاقة الشمسية في العالم خلال فترة ذروة الإنتاج. وهذا المشروع يعمل على توليد البخار اللازم للاستخراج المعزز للنفط بالحرارة عبر الاستفادة من أشعة الشمس، وذلك باستخدام تكنولوجيا البيت الزجاجي المبتكرة. وسيوفر هذا المشروع، الذي تبلغ سعته الإنتاجية ١ جيجابايت ٥,٦ ترليون وحدة حرارية بريطانية من الغاز الطبيعي سنويا يمكن تحويلها إلى استخدامات أعلى قيمة في عمان، مع خفض انبعاثات غاز ثاني أكسيد الكربون بمعدل ٣٠٠ ألف طن سنويا.

وقد بدأ العمل عام ٢٠١٢ في حقل هرويل ٢ أب، حيث نجري مشروعنا الأول لحقن الغاز القابل للمزج من أجل الاستخراج المعزز للنفط. وقد نجحنا في سداد المبلغ الكامل بشكل عاجل لمشروع هرويل ٢أب الاستثماري، ونواصل زيادة الاحتياطيات والإنتاج، على الرغم من العمل في بيئة معقدة تتسم بالضغط المرتفع والسوائل الحامضة المسببة للتآكل.

وكنا سعينا في البداية لإنتاج ١٦٠ مليون برميل نفط إضافية عبر الاستخراج المعزز للنفط باستخدام الغاز القابل للمزج في حقل هرويل ٢أب، غير أننا الآن نستهدف إنتاج ٢٥٠ برميل نفط إضافية من مشروع رباب هرويل المتكامل الجديد الذي تبلغ تكلفته عدة مليارات من الدولارات. وهو حاليا في طور الإنشاء. ويتم خلال المشروع حقن الغاز القابل للمزج في سبعة خزانات نفط. كما يشمل أيضا إعادة تدوير الغاز الحامض في حقل رباب المجاور لتكثيفه. ومن المتوقع أن يبدأ الإنتاج في ٢٠١٩ .

● إلى أي مدى أثر انخفاض أسعار النفط على الخطط التنموية لشركة تنمية نفط عمان، وهل اتخذتم أية إجراءات لمواجهة ذلك؟

●● لقد تمكنا من الاحتفاظ بخططنا التنموية، وسنواصل تنفيذ المشروعات بنشاط وبوتيرة سريعة لتحقيق إيرادات أعلى. كما أننا، في الوقت نفسه، لا نألو جهدا للتحكم في التكاليف. وفي هذا الصدد، يعتبر التعاون الأوثق مع مقاولينا أمرا ضروريا. وقد أجرينا حتى اللحظة ٢٥ مراجعة لتحسين العقود لرفع مستوى الكفاءة للعمليات القادمة. ولدينا بالفعل برنامجٌ نشطٌ لتحسين الأعمال بشكل متواصل يستهدف النفايات والتكرار وتنظيم

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قائلا: «لا أعتقد أنه توجد مخاطر متعلقة بحدوث إضرابات في المستقبل».

وقد ذكر ممثل النفط أيضا أن الكويت تخطط لرفع القدرة التكريرية المحلية إلى ١,٤ مليون برميل يوميا، وتعزيز التعاون الدولي عبر إبرام اتفاقيات الخدمة. وربما يستأنف حقلا النفط المشتركان مع المملكة العربية السعودية على مساحة هائلة تبلغ ٦ آلاف كيلومتر مربع، الإنتاج في غضون عام. وفي معرض تعليقه على إبرام اتفاق لإعادة العمل في الحقلين، قال العطار: «من الصعب للغاية تحديد توقيت ذلك، غير أن العمل يجري في هذا الشأن. نسمع أن الإنتاج سيعود في غضون شهر أو ربما عام، ولكننا لا نعرف متى بالتحديد». ويقع حقلا النفط، الوفرة البري والخفجي البحري، في المنطقة المحايدة المقسومة التي توجد بين الكويت والسعودية. وتبلغ القدرة الإنتاجية لحقل الوفرة النفطي ٢٠٠ ألف برميل يوميا، بينما ينتج حقل الخفجي ٣٠٠ ألف برميل يوميا.

لويس خوري، نائب الرئيس الأول للعمليات في الشرق الأوسط وإفريقيا VEV

شـراكـة بين أومنكـــس و AVEVA تركز على السعودية والكويت وقطر

أبرمت كلٌ من أومنكس إنترناشونال لتوفير الحلول التكنولوجية لمنطقة الشرق الأوسط و AVEVA موفرة البرمجيات الهندسية البارزة على مستوى العالم، اتفاقية شراكة رسمية تهدف لسد الاحتياجات التي تزداد تعقيدا اليوم تلو الآخر في مجال النفط والغاز بالمملكة العربية السعودية والكويت وقطر. وبموجب هذه الاتفاقية، سوف يتسنى لشركة أومنكس، التي لها خبرة تربو على ٢٥ عاما في العمل بهذه المنطقة، تقديم الحلول البرمجية الخاصة بشركة AVEVA لعملائها. وتساعد الأدوات الهندسية وأدوات التصميم، التي تطرحها AVEVA، الشركات الهندسية والمُلاك المشغلين على زيادة سرعة وكفاءة تنفيذ المشاريع وتعزيز كفاءة العمليات. وتعكف أومنكس على تكوين فريق مخصص من خبراء AVEVA يجمع بين المعرفة المحلية والخبرة الفنية المعتمدة التي تتمتع بها AVEVA.

وقال جايانت ديشباند، المدير في شركة أومنكس: «يتزايد الطلب على الطاقة في منطقة الشرق الأوسط وشمال إفريقيا بمعدل ثلاثة أضعاف متوسط الطلب العالمي. وعلى الرغم من الضغوط الواقعة على أسعار النفط، فإن قطاع النفط والغاز بالمنطقة لا يزال يُجري مشاريع نشطة تقدر قيمتها الإجمالية بحوالي نصف ترليون دولار».

وقال: «على الجانب الآخر من هذه النظرة الإيجابية، هناك ضغوط هائلة على القطاع لتحسين الأداء بسبب الزيادة في تعقيد المشاريع. ولا شك أن التكنولوجيا تلعب دوراً مهماً للغاية في تحسين الأداء، وهو ما دفعنا لتقييم مجموعة استثماراتنا لضمان استمرارنا في توفير حلول على الطراز العالمي والتي تشتهر بها أومنكس في المنطقة. وبعد إجراء مراجعة دقيقة لحالة السوق، أصبح من الواضح أن حلول AVEVA في قطاع النفط والغاز ستساعد عملاءنا على رفع مستويات اليقظة والكفاءة والفعالية وسط هذه الاضطرابات. والأهم من ذلك أننا قد اكتشفنا، بعد مقابلة الفريق التنفيذي في AVEVA، شريكا يمكننا التعاون معه بشكل وثيق، وأننا قد أصبحنا امتدادا لأعمال AVEVA». وصرح لويس خوري، نائب الرئيس الأول للعمليات في AVEVA الشرق الأوسط وإفريقيا بقوله: «تحظى AVEVA بسجل حافل من النجاحات في الإمارات العربية المتحدة وعمان، حيث تربطنا علاقات مباشرة بالمستخدمين النهائيين. لكننا ندرك أيضا أن الأسواق في المملكة العربية السعودية وقطر والكويت تستحق الدعم المتخصص والبنية التحتية القوية. ومن المهم امتلاك حضور محلي قوي للموارد الفنية التي تحظى بخبرات عريقة لتوفير أقصى مستويات مساعدة العملاء بشكل مباشر. ويمكننا الآن تزويد شركات الهندسة والمشتريات والإنشاءات والمُلاك المُشغلين، بالخبرة المباشرة وإمكانية استخدام باقة عريضة من منتجات وخدمات AVEVA».

مفكرة رجال الاعمال

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نوفمبر / تشرين الثاني

٧ ـ ١٠ ـ مؤتمر ومعرض أبوظبي الدولي للبترول ـ أديبك ٢٠١٦ ـ أبوظبي

دوجلاس ويستوود تتوقع استمرار نمو أعمال الحفر البرية في الشرق الأوسط

الشرق الأوسط يشهد نموا في أعمال الحفر

آعداد الآبار البرية، التي يتم حفرها في منطقة الشرق الأوسط، مستمرة في الزيادة لتتجاوز التوجهات العالمية، حسبما ذكرت شركة دوجلاس ويستوود لبحوث السوق. وقالت الشركة إن منطقة الشرق الأوسط كانت دائما جاذبة لأنشطة الحفر والتنقيب والإنتاج خلال فترة انهيار أسعار النفط بين عامي ٢٠١٤ و٢٠١٥.

وقد أوردت شركة دوجلاس ويستوود، في تقريرها بعنوان «توقعات سوق الإنتاج والحفر»، انخفاض عدد الآبار البرية، التي تم حفرها في العالم، بنسبة ٣٢ في المائة، وذلك لأن المشغلين قد اتجهوا إلى خفض عمليات الحفر. غير أن منطقة الشرق الأوسط، التي تتسم بانخفاض تكاليف إنتاج النفط والتي تستحوذ على ما يقرب من نصف عضويات «أوبك»، كانت مُحصنة إلى حد ما - من هذا الانهيار، وحققت نسبة نمو تبلغ ٣ في المائة.

وتتوقع دوجلاس ويستوود أن يواصل الشرق الأوسط تخطي التوجهات العالمية، وتتنبأ بزيادة أخرى بنسبة ٣ في المائة في عدد الآبار البرية التي سيتم حفرها هذا العام. علما بأن شركات أبراج الحفر الدولية، على غرار سايبم، تركز في إستراتيجيتها، وعمليات الحفر التي تقوم بها، على المنطقة، في محاولة للحد من التأثير السلبي الناجم عن انخفاض أسعار النفط.

وعلى الرغم من هذا النمو، لم تُستثن المنطقة تماما من تأثير هذا الانخفاض. إذ أبطأت بعض شركات النفط الوطنية، مثل أرامكو السعودية، من وتيرة عدد من المشروعات قيد التنفيذ. وبخلاف أعمال الحفر والإنتاج، يعاني بالفعل - وبشدة - منتجو الخليج، المعتمدون على السلع الأساسية، من ضائقة مالية. وقد تلقت عمان، غير العضوة في منظمة 'أوبك'، ضربة موجعة عندما خفضت كل من موديز وستاندرد آند بورز تصنيفها الائتماني.

ومع ذلك، من المتوقع أن يفضي الاعتماد الإقليمي، على صادرات النفط، إلى دعم النشاط المتواصل. وهناك علامات مضيئة واضحة في المنطقة، حسب دوجلاس ويستوود. فإيران أصبحت، منذ رفع العقوبات الاقتصادية عنها في يناير/كانون الثاني، فرصة ذهبية محتملة لشركات أبراج الحفر الدولية. ويسرد تقرير توقعات سوق النفط والغاز في إيران، الصادر عن دوجلاس ويستوود، زيادة الطلب على أبراج الحفر البري بنسبة ٦ في المائة حتى عام ٢٠٢٠، مع ثبات معدلات الإنتاج تقريبا عند المستوى السابق لفرض العقوبات. بيد أنه لا تزال توجد بعض العقوبات الأمريكية المزدوجة المفروضة. وقد يحول ذلك دون دخول الشركات الأمريكية إلى السوق مباشرة، ومن ثم تكون الفرصة متاحة أمام الشركات المحلية القائمة في الشرق الأوسط، على الأقل على المدى القصير. وبناء على ذلك، ربما تكتسب الشركات في الأسواق المجاورة ميزة المتحرك الأول.

الكويت تصدق على خطط لزيادة إنتاج النفط

تستهدف الكويت زيادة إنتاج النفط بنسبة ٥٠ في المائة خلال السنوات الأربع المقبلة في مساعيها لتأمين النمو الاقتصادي في المستقبل. وقد ذكر عبد العزيز العطار، رئيس قسم البحوث في مؤسسة البترول الكويتية المملوكة للدولة، خلال حديثه في قمة بلاتس للنفط الخام في لندن، أن الدولة تهدف إلى إنتاج أربعة ملايين برميل يوميا بحلول ٢٠٢٠ ، والمحافظة على هذا المستوى حتى ٢٠٣٠، كما تؤكد مرة أخرى على تكثيف الإنتاج. وسوف تمثل هذه الزيادة ما نسبته ٤٤ في المائة من إنتاج الكويت الذي بلغ ٢,٧٧ مليون برميل يوميا في مارس/آذار، حسب آخر تقرير شهري صادر عن منظمة 'أوبك'.

وسوف تعادل هذه الزيادة أيضا أعلى مستوى إنتاج على الإطلاق، وفقا لبيانات بلومبرج. وقال العطار خلال المؤتمر: «إننا ننتوي أيضا توفير إمكانات تخزين الوقود لتلبية المتطلبات الموسمية والمحلية من الطاقة». وقد صدرت هذه التعليقات بعد إضراب استمر لثلاثة أيام أدى إلى خفض إنتاج النفط إلى ١,٥ مليون برميل يوميا في شهر أبريل/نيسان الماضي. غير أن العطار بدد المخاوف بشأن حدوث أحداث مشابهة تؤثر بشدة على الإنتاج في المستقبل. وأردف

تنوي الكويت زيادة إنتاجها من النفط إلى ٤ ملايين برميل يوميا مع حلول ٢٠٢٠

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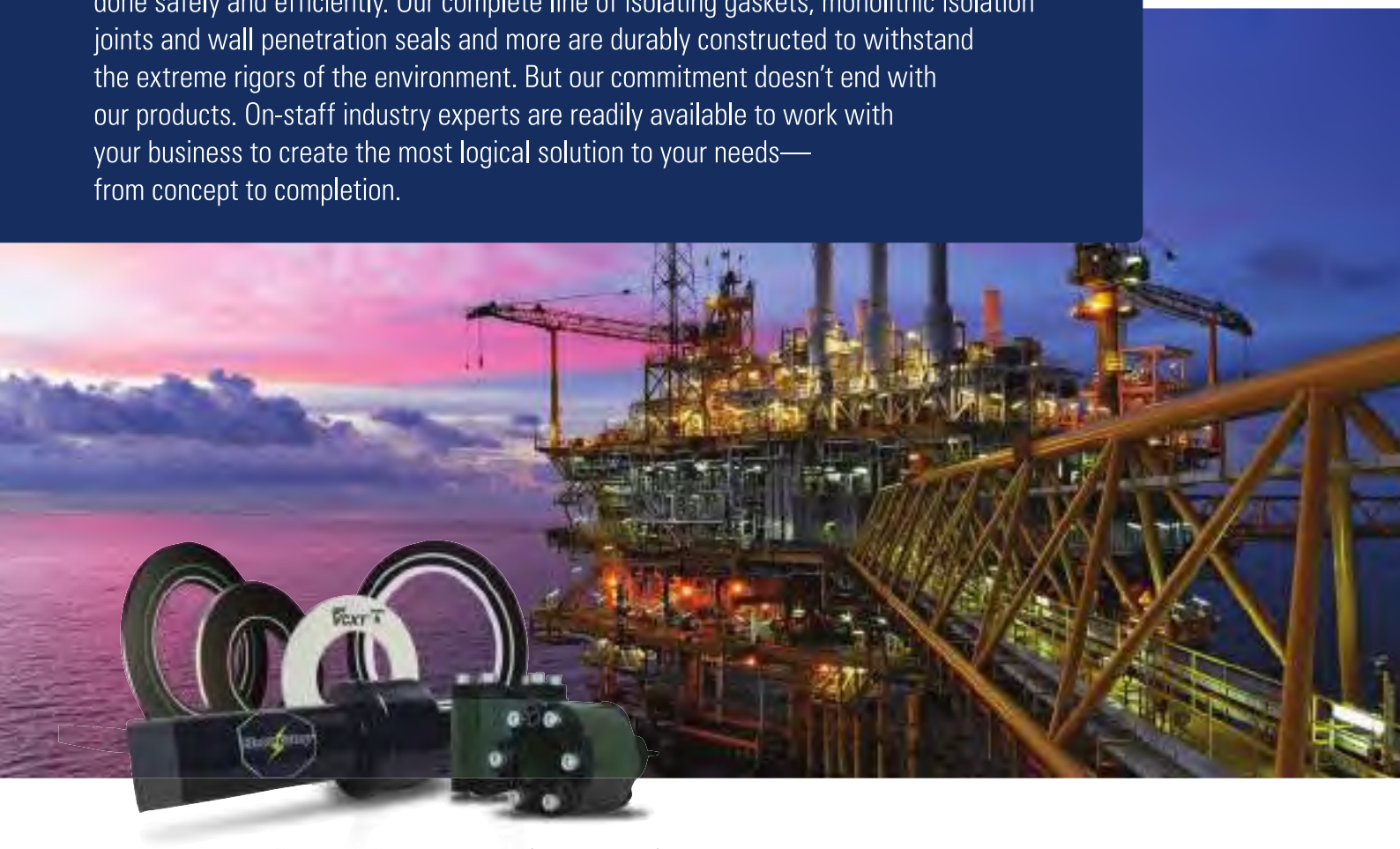

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