

Oil Review

Oil · Gas · Petrochemicals

Middle East

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Improved prospects for
the oil market?

- Egypt turns a corner
- New drilling innovations
- Transforming the digital oilfield
- Better asset management for refining & petrochemicals
- A proactive approach to well integrity
- Upstream investment in the Middle East

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→ Editor's note

IN OUR LEAD article on p14 we look at prospects for the oil market in 2017 which, at the time of writing, are looking positive, with oil prices relatively stable in the wake of co-ordinated action by OPEC and non-OPEC countries to cut production. However, a disciplined approach to production cuts will be critical for stable, higher oil prices and the revival of upstream capital expenditure, while global storage inventories need substantial reduction before higher prices prove sustainable.

As the article on p22 points out, the core GCC OPEC producers will benefit the most from the upturn in the market.

MEOS 2017, with its theme of 'Transforming the Industry through Innovation and Operational Excellence' will provide a forum to discuss current issues and challenges facing the industry – see our preview on p23. We hope to see you there!

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Cover image: Chalalai Atcha/Shutterstock

→ Executives' Calendar 2017

MARCH

6-9	Middle East Oil Show (MEOS 2017)	MANAMA	www.meos17.com
14-16	SPE/IADC Drilling Conference & Exhibition	THE HAGUE	www.spe.org/events
26-30	SOGAT 2017	ABU DHABI	www.sogat.org

APRIL

4-7	Gastech	TOKYO	www.gastechevent.com
11-12	Middle East Heavy Oil Congress (MEHOC)	MANAMA	www.meheavyoil.com
21	Oil & Gas Bash	DUBAI	www.expatbloke.com/events
26-27	StocExpo Middle East Africa	DUBAI	www.stocexpomiddleeastafrika.com

MAY

3-5	23rd International Energy & Environment Fair	ISTANBUL	www.icci.com.tr/en
5-8	Offshore Technology Conference (OTC)	HOUSTON	www.otcnet.org
6-9	International Oil, Gas, Refining & Petrochemicals Exhibition	TEHRAN	www.iran-oilshow.ir
9-10	Offshore Arabia	DUBAI	www.offshorearabia.ae
22-23	Iraq Petroleum	LONDON	www.cwciraqpetroleum.com
23	EIC Connect Oil & Gas UAE 2017	ABU DHABI	www.the-eic.com/EICConnect
31-3 June	Caspian Oil & Gas	BAKU	www.caspianoilgas.az

JUNE

12-15	EAGE Conference & Exhibition	PARIS	www.eage.org
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Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.

SOGAT 2017 focuses on practical gas conditioning

SOUR FIELD DEVELOPMENT plans are ongoing throughout the Middle East given the gas demand, and nowhere more so than in the UAE, where priorities in ADNOC's integrated gas master plan include tapping into deep and sour gas reserves, improving the processing capacity of the Al Hosn Shah plant by 50 per cent and deploying innovative CCUS (carbon capture, utilisation and storage) for EOR.

These issues will be a focus of the SOGAT conference programme that will also include presentations of sour processing projects in Egypt, Oman and Saudi Arabia. Sessions will focus on reducing project costs and risks, improving energy efficiency in processing plant, operational safety issues in real time, practical solutions for overcoming SRU operational problems, CCUS future and current regional plans and effective contaminant removal case studies.

In addition there are five in-depth pre-conference workshops on sour oil and gas process optimisation; amine treating; improving SRU cost efficiencies and associated KPIs; benefits of hybrid solvents for mercaptan in



Exploiting sour gas reserves are a priority in the Middle East. (Photo: Anupong Nantha/Shutterstock)

natural gas; and CCUS. Together with the exhibition of new technical developments and services, SOGAT 2017 provides a complete overview of current sour gas management concerns.

SOGAT 2017, which takes place at the Beach Rotana Hotel Abu Dhabi from 26-30 March, has

the full support of the ADNOC Group, OXY, Saudi Aramco and ExxonMobil as well as the leading contractors and consultants in sour hydrocarbon management.

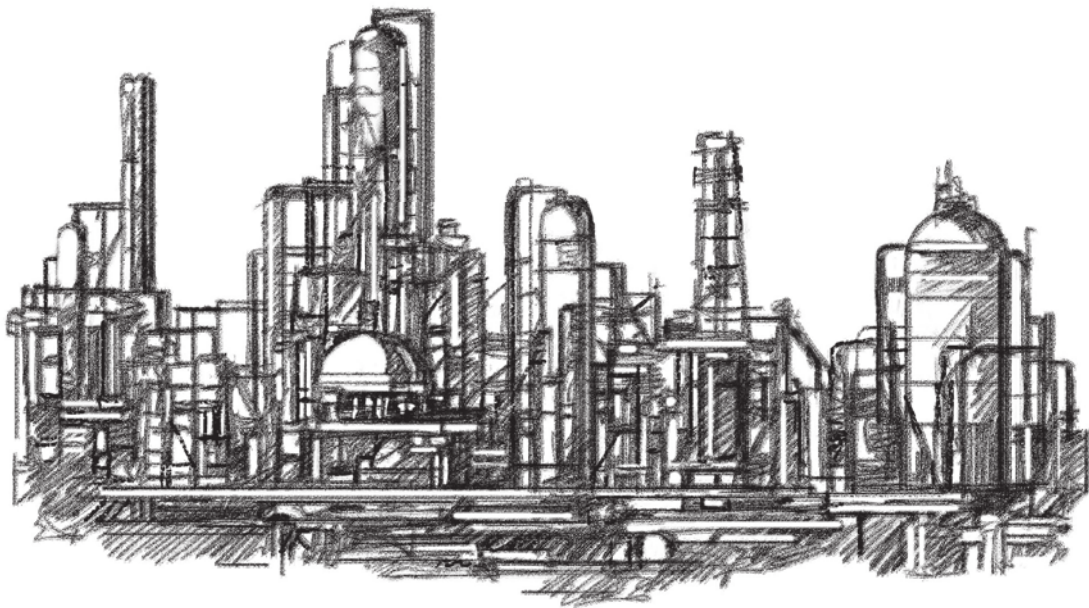
Full details of SOGAT 2017 can be found at www.sogat.org



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Focusing on tank storage developments

StocExpo Middle East Africa, the region's leading exhibition and conference for the bulk liquid storage market, will be held at the Dubai World Trade Centre on 26 and 27 April 2017.

THE MIDDLE EAST and African tank storage sector is developing at a rapid rate, thanks to continued large-scale investment, with the UAE alone set to double its storage capacity in the next few years.

Top regional oil companies, tank terminal operators, traders, financiers and regulators are confirmed to speak at StocExpo Middle East Africa, which is supported by the UAE Ministry of Energy, alongside many oil majors, ports, terminals and institutions including ENOC, Fujairah Oil Terminal, GPS Chemoil, Gulf Refining Co., Gulf Petrochem, Horizon Terminals, Siddco, Socar Aurora and Star Energy OilTankng.

Attendees will have the opportunity to visit an exhibition with more than 100 international and local suppliers showcasing the latest equipment and state-of-the-art technologies. Exhibitors will include CTS Middle East, Protego, Emco Wheaton, Loadtec Engineered Systems, Mascoat, and Kanon Loading Equipment to name just a few. These span the entire supply chain, from tank design, construction and maintenance, through to innovations in metering and measuring, pumps and valves, automation and loading equipment and inspection and certification services.

At the core of this year's event will also be a two-day conference, addressing the most significant trends, challenges and opportunities facing the tank storage industry in the Middle East and Africa.

Topics will include growth and expansion opportunities across the Middle East, financing, oil price trends and their impact, improving safety, efficiency and resilience, Fujairah's role as a trading hub and many others.

Among the industry leaders taking part will be Ghassan Alakwaa, analyst – Energy Research, APICORP; Kamel Al-Harami, independent oil analyst and former president, Kuwait Petroleum International; Tushar Bansal, director, Ivy Global Energy Pte; Bora Bariman, head of Energy & Marine



More than 100 international and local suppliers will showcase the latest equipment and state-of-the-art technologies.

– Corporate & Institutional Banking Group, National Bank of Fujairah; Edward Bell, commodity analyst, Emirates NBD Bank; Paul Collins, global leader for Productivity Optimisation, Arcadis; Aydin Erdmir, vice-president, Toros Terminal; Waddah Ghanem, executive director, EHSSQ & Corporate Affairs, ENOC; Patrick Kulsen, managing director, PJK International; Capt. Tamer Masoud, harbour master, Port of Fujairah;

Zaid Mohammad, general manager, Beydal Petroleum; Erwin Mortelmans, commercial director, Port of Duqm; and Paul Young, head of Energy Products, Dubai Mercantile Exchange.

Nick Powell, StocExpo and Tank Storage portfolio event director said, "One look at this year's programme shows how serious we are about delivering world-class content, finely tailored to global and local needs and the interests of terminal operators in the region.

"Delegates can expect a stellar mix of regional, international and highly technical content, delivered by world authorities."

Attendees will also have access to a Networking Lounge, as well as a variety of networking events, including an official exhibition networking reception on the first evening of the event. ■

“Delegates can expect a stellar mix of regional, international and highly technical content, delivered by world authorities.”

Nick Powell, StocExpo and Tank Storage portfolio event director

Anyone wishing to attend the exhibition or conference can register online at www.stocexpomiddleeastafrica.com



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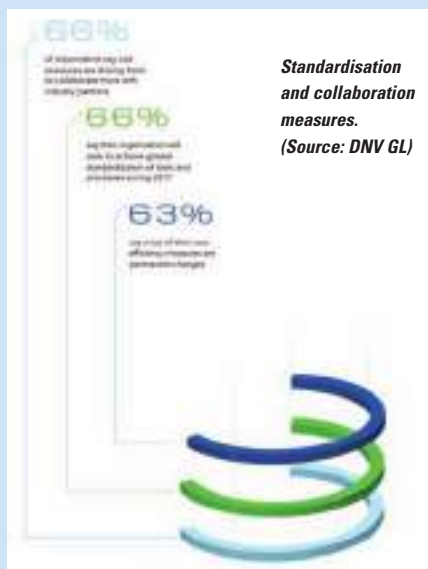
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Oil and gas companies restructure for long-term sustainable growth

NEW RESEARCH BY DNV GL, technical advisor to the oil and gas industry, shows oil and gas companies seeking to rebalance business portfolios and reorganising for a new era. *Short-term agility, long-term resilience*, DNV GL's seventh annual benchmark study on the outlook for the oil and gas industry, surveys senior oil and gas professionals worldwide.

In a period of drawn-out recovery, 49 per cent of senior oil and gas professionals surveyed expect their businesses to diversify into, or invest more in, opportunities outside of oil and gas. Still, almost eight out of 10 see long-term opportunities for gas. 26 per cent of industry leaders expect their business to invest in renewable energy in 2017, with a majority seeing investments in renewables as a shift in long-term business strategy. 21 per cent report that their organisations have already increased their sustainability efforts as a result of the COP21 agreement, which came into force in November 2016.



Priorities for cost cutting in 2017. (Source: DNV GL)

"The number of companies we now see pursuing opportunities beyond oil and gas signals a step change in the reshaping of the sector and demonstrates its ability to adapt and build a more robust, diverse and sustainable energy future," says Elisabeth Tørstad, CEO, DNV GL – Oil & Gas.

Oil and gas professionals expect investments to continue across the value chain in 2017, though at a lower level than last year, as the percentage of respondents expecting to maintain or increase CAPEX has dropped from 43 per cent to 39 per cent. Notably, 77 per cent believe gas will become an increasingly important component of the global energy mix over the next 10 years.

A third of respondents say their organisations will be increasing M&A activity in the next 12 months, while more than three-quarters of respondents expect increased industry consolidation.

Eighty-five per cent see cost management as a top or high priority for 2017, and a majority see their current cost-efficiency measures as marking a permanent shift towards a leaner way of working. Organisational restructuring, reducing operating expenditure and improving efficiency from existing assets are the top three priorities for cost control. The focus on workforce reduction as a cost-cutting measure has dropped, although 55 per cent still say that

overall headcount in 2017 is expected to decrease.

Two-thirds say that the cost pressures are driving more industry collaboration, and 66 per cent of respondents say their organisation will seek greater standardisation of tools and processes, up from 59 per cent last year. 49 per cent of respondents agree that the industry downturn is helping to reduce the complexity of projects and operations.

Digitalisation is also increasingly seen as a means to enhance operational and cost efficiencies, with 39 per cent expecting their organisation's spend in this area to increase in 2017. Half (49 per cent) of respondents also said their organisation will embrace digitalisation to increase profitability.

"Last year, we saw intense and painful short-term cost-cutting measures in the industry," Tørstad comments. "Though few expect a recovery in 2017, and cost-cutting measures are still on the table this year, confidence in the oil and gas sector growth has stabilised for now and opportunities are being created. Improved focus on collaboration, standardisation and digitalisation will enable the industry to transform to meet the demands of the new era and become profitable in volatile markets."

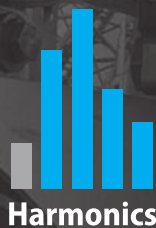
The report can be downloaded at <http://www.dnvgl.com/industryoutlook2017>.



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* Refer to Terra Nova FPSO case study.



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OPEC posts first year-on-year decline in oil production since 2015

THE INTERNATIONAL ENERGY Agency (IEA) released its Oil Market Report on 10 February 2017 stating that global oil supplies plunged by nearly 15mn bpd in January 2017, with both OPEC and non-OPEC countries producing less oil.

The world produced 96.4 mn bpd, 730,000 bpd below the same time last year. A lot of this was due to OPEC posting its first year-on-year decline since the beginning of 2015. OPEC countries' crude production fell by 1mn bpd, to 32.06 mn bpd in January 2017. The IEA estimated that there was a record initial compliance of 90 per cent of the OPEC output agreement. Some countries, including Saudi Arabia, actually cut more than they agreed. However, lower production was also partly offset by the higher production flows from both Libya and Nigeria, which are exempt from the cuts.



Fatih Birol,
executive director of the IEA

The IEA predicts that non-OPEC countries' output will grow by 0.4 mn bpd in 2017. This is after a fall in production in 2016, when non-OPEC countries' production fell by 0.8 mn bpd.

The IEA report states, "We do not forecast what OPEC production will be during the six months covered by the output deal; but if the January level of compliance is maintained, the difference between global demand and supply implies a stock draw of 0.6 mn bpd. It should be remembered, though, that this stock draw is from a great height. OECD stocks of crude and products have fallen for five consecutive months and in Q4 of 2016 they drew by nearly 800,000 bpd. At the end of the year they were still 286 mn bbl above the five-year average level and by the end of the first half of 2017 they will remain significantly above average levels. The continued existence of high stocks, plus caution from the

markets in assessing the level of output cuts and how other producers might grow production, explains why Brent crude oil prices have remained at the mid-US\$50s/bbl level since mid-December after receiving a post-output deal boost of close to US\$10/bbl. The oil market is very much in a wait-and-see mode."

IHS Energy commented on the report stating, "The big questions on the future of the deal remain unanswered. US production is beginning to ramp up and could grab the market share released by OPEC. This could put the future of the deal into question. Both Libya and Nigeria, although OPEC members, were excluded from the deal because current production is significantly below their historic average. If either was able to recover production then this will add further pressure to the deal."

Sandvik wins regional contracts in MENA

SANDVIK, A DEVELOPER and producer of advanced stainless steels, special alloys, titanium, and other high-performance materials, announced on 8 February that it has secured a number of orders offshore Egypt to provide oil and gas solutions for the ongoing giant gas field developments in the region, in the last 12 months, with contract values of at least US\$107mn.

Sandvik has seen double-digit growth in the region over the past three years and recently established its EMEA Oil and Gas headquarters in Dubai, UAE.

Phil Cherrie, regional sales and marketing manager, oil and gas, EMEA, Sandvik, said, "Operating in an offshore environment such as the Mediterranean Sea requires materials that are able to withstand the harsh conditions that these operations present. Having been chosen by the operators as well as equipment manufacturers and service providers to provide these solutions serves as testament to the quality of Sandvik's products and solutions."

As part of the contracts, Sandvik will be providing Super Duplex steel umbilical tubing; SANICRO 28, a high-alloy, high-strength austenitic stainless steel for OCTG downhole production tubing together with alliance partner Tenaris; seamless alloy 625 control line and chemical injection lines encapsulated with tubing encased conductor (TEC lines).



Phil Cherrie, Sandvik regional sales and marketing manager.

BP's share price falls on lower than expected profits

BP'S SHARE PRICE fell by 2.4 per cent on the morning of 7 February after it reported a fourth-quarter profit of US\$400mn, US\$160mn short of what analysts at Reuters were expecting.

However, the story is more complex than just a lack of market confidence. For the year 2016, the underlying profits of BP fell to US\$2.6bn from US\$5.6bn in 2015, the volatile oil prices being largely to blame for this. BP says that significantly lower operating costs affected this figure as well. BP also took an additional charge of US\$799mn for the Deepwater Horizon disaster.

"We have adapted by cutting our controllable cash costs by US\$7bn from 2014 - a full year earlier than planned. Continued tight discipline on costs remains essential," Bob Dudley, BP group chief executive, said.

While BP achieved US\$400mn underlying cost replacement profit for Q4 of 2016, Reuters predicted that BP would achieve US\$560mn.



Bob Dudley,
BP's group chief executive

BP has announced that when the oil price reaches US\$60 per barrel, it will be able to balance the books by the end of 2017. The average price of Brent crude in 2016 was just US\$44 per barrel, the lowest in 12 years.

The group has been making acquisitions recently, including obtaining Australian petrol stations at the end of 2016, acquiring a 10 per cent stake in the ADCO concession, giving it access to Abu Dhabi's largest oilfields, and taking a stake in exploration areas off the coast of Mauritania and Senegal.

Including estimated additional organic capital spending associated with the portfolio additions, organic capital expenditure is now expected to be US\$16-17bn in 2017, according to Reuters.

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Sanctions relief strengthens outlook for NPC Iran

NPC IRAN, IRAN'S state-owned petrochemical conglomerate, is positioned for strong market growth and increased exports, as a result of easing sanctions and an abundant supply of flexible feedstocks, among other factors, a new report from IHS Markit reveals.

"NPC Iran has traditionally been a regional producer of petrochemicals, but with sanctions relief, the company expects to significantly expand its output capacity and increase its exports to meet demand outside the Middle East," said Mohit Sood, senior principal chemical analyst at IHS Markit and lead author of the NPC

Iran report. "The company has an aggressive development plan and expects its total petrochemical output to reach 180 mmt per year by 2025, which, if achieved, will more than quadruple its 2014 output capacity," Sood said.

Sood also pointed out that economic sanctions on Iran as well as technological constraints and mechanical problems led to construction-related delays, causing cancellations and start-up issues for several Iranian projects. "Differences in the timing of the completion of feedstock and derivative units also contributed to poor operating performance. The sanctions relief once

fully realised is expected to remove operational bottlenecks and strengthen the outlook for Iranian operations," he stressed.

NPC Iran has grown in the past by forming partnerships domestically as well as internationally. According to the IHS Markit report, with the current lifting of sanctions, the company is expected to merge or partner with other companies in order to expand its business. Significant supply of oil and gas feedstocks and lower financial constraints position Iran's petrochemical company for strong growth and expansion.

Iran and Oman reaffirm gas export deal

OMAN AND IRAN have reaffirmed a planned undersea gas export pipeline between the two countries. Iran's oil minister Bijan Namdar Zanganeh said the countries have agreed to change the route of the pipeline to avoid waters controlled by the UAE after meeting his Omani counterpart in Tehran.

The planned pipeline would connect Iran's vast gas reserves with Omani consumers and liquefied natural gas (LNG) plants in the country that could re-export the gas.

"The two countries agreed that the gas exports pipeline avoids waters controlled by the UAE and passes through deep waters," said the minister.

In 2013, the two countries signed an agreement for a new export pipeline in a deal valued at US\$60bn over 25 years. After international sanctions on Tehran were lifted in January 2016, the two countries renewed efforts to implement the project but it has also been delayed by disagreements over price and US pressure on Muscat to find other suppliers.

Zanganeh told the press that a new agreement that extends the previous deal was signed during his meeting with Oman's Minister of Oil and Gas Mohammed bin Hamad al-Rumhy in Tehran. He stressed that the change of the pipeline route through deep waters has no economic impact on the gas exports project. The meeting in Tehran was attended by representatives from Shell, Total and Korea Gas Corp (KOGAS), who offered their proposals. The whole project is expected to require US\$1.2bn of investment.

Qatar Petroleum to explore oil and gas in Morocco and Cyprus

STATE-OWNED ENERGY giant Qatar Petroleum (QP) has announced plans to explore oil and gas in Morocco and Cyprus. The company chief executive Saad al-Kaabi said that QP is aiming to expand its liquefied natural gas (LNG) assets abroad while trimming costs at home.

"You will see us going internationally with some of the partners we have in Qatar, this year and next year. We are in growth mode," Kaabi told reporters at the company's headquarters in Doha.

Kaabi said that, QP, the world's largest LNG producer, has been pursuing deals in Cyprus where it won a bid for 40 per cent of a plot for exploration and recently went into Morocco for exploration.

In response to the slump in oil prices that has forced Gulf countries to reduce state spending, QP is merging two of its LNG divisions, Qatargas and RasGas. Kaabi said that QP is reducing costs at its domestic operations and looking to expand overseas through joint ventures with international oil companies to maintain dominance over its key competitors, the USA and Australia.



The company aims to expand overseas through joint ventures with international oil companies. (Photo: James Jones Jr/Shutterstock)



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New realities shaping the oil outlook

Moin Siddiqui, economist, suggests we may see a more positive outlook emerging for the oil industry in 2017.

THE COMING MONTHS should see a gradual price recovery, driven by global supply and demand dynamics. Many experts foresee oil markets to balance in 2017, as world economic growth improves, consumption rises mainly in non-OECD countries (led by India and China), while global output declines, albeit with still higher inventories. However, a disciplined approach to production cuts by both OPEC and non-OPEC producers are critical for stable, higher oil prices and the revival of upstream exploration and production capital expenditure.

“After two years of global glut, the market could move into deficit by mid-year.”

After two years of global glut in excess of 1.5mn bpd, the market could move into deficit by mid-year, thus forcing inventories to deplete. This is contingent on core producers delivering on the combined 1.8mn

bpd cuts in H1 2017 – with a compliance rate of at least 70 per cent – with the probability of an extension for the remainder of 2017. The most significant cuts are anticipated to come from the Gulf Cooperation Council (GCC), which amounts to over two thirds of the 1.2mn bpd to be removed from the market via OPEC producers (excluding Libya and Nigeria).

OPEC's surplus capacity (i.e. output brought online within 30 days and sustained for 90 days) is expected at 1.3mn bpd in 2017; a figure of below 2.5mn bpd indicates a relatively tight market. Oil supplies are vulnerable to conflict in Iraq, Libya, Nigeria and Venezuela. However, stock overhang makes projected low surplus capacity less relevant. The International Energy Agency (IEA) estimated OECD industry stocks above the symbolic three billion barrels level at end-2016, equivalent to roughly 66 days of forward consumption.

New price range

Global storage inventories need substantial reduction before higher oil prices prove sustainable. Stockpiles (crude/products) remain above the five-year average. Barring hefty inventory drawdown or supply outages, the probability of a US\$65-70/bbl price range is remote. Oil should hover in the mid-US\$50s (near-term) before challenging the US\$60 barrier in the third or fourth quarter. The availability and responsiveness of US light tight oil may cap any significant oil price hikes. Oil at US\$65-plus could prompt heavy new investments into shale basins and other expensive places like the North Sea, Canada (oil-sands), and deepwater off Brazil and Gulf of Guinea (West Africa) – threatening OPEC's future market share.

Therefore, it's in the cartel's interest to cap crude below US\$60/bbl since recent productivity gains and cost reductions can boost further US shale drilling. Shale “fracklog” (drilled but uncompleted wells) can quickly start production within a short

Table1: The world's top tier oil producers

	Output 2016 mn bpd	Reserves (bn barrels) End-2015	Oil income US\$bn 2013-15
Non-OPEC			
USA*	13.63	55.0	
Russia	11.08	102.4	448.1
Canada **	4.44	172.2	150.5
China	4.07	18.5	
Brazil	3.15	13.0	
Mexico	2.47	10.8	118.3
Total	38.84	371.9	
% of non-OPEC total	72.6	76.5	
OPEC /			
Saudi Arabia	10.41	266.6	695.7
Iraq	4.38	143.1	243.1
Iran	3.49	157.8	108.9
Kuwait	2.78	101.5	191.3
United Arab Emirates	2.96	97.8	244.0
Venezuela //	2.15	300.9	169.3
Total	26.17	1,067.7	1,652.3
(%) of OPEC total	80.7	88.1	74.7

Notes:

* US output also includes shale oil and natural gas liquids (NGLs).

Energy Information Administration year-end 2015 data put US tight oil reserves at less than 12bn barrels. Shale has the edge of lower and shorter investment cycles compared to conventional oil.

** Canada reserves comprise oil sands (bitumen and synthetic crude).

// OPEC production includes only crude oil (excluding NGLs).

// Venezuela reserves comprise extra-heavy crude and bitumen deposits.

Sources: OPEC, EIA, BP, and Petroleum Economist Outlook 2017

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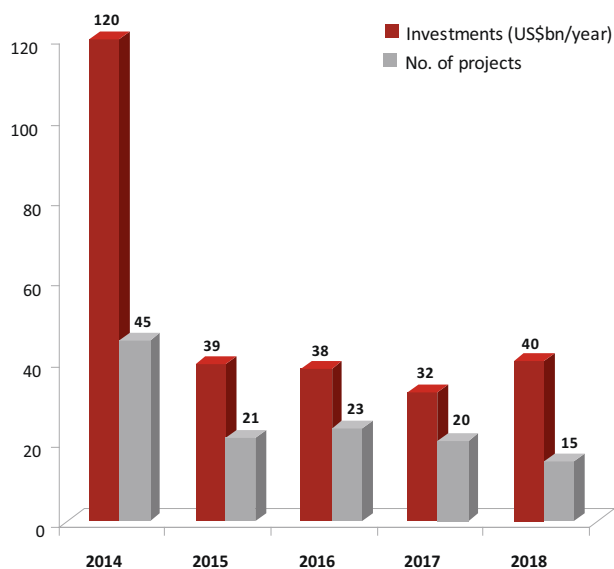
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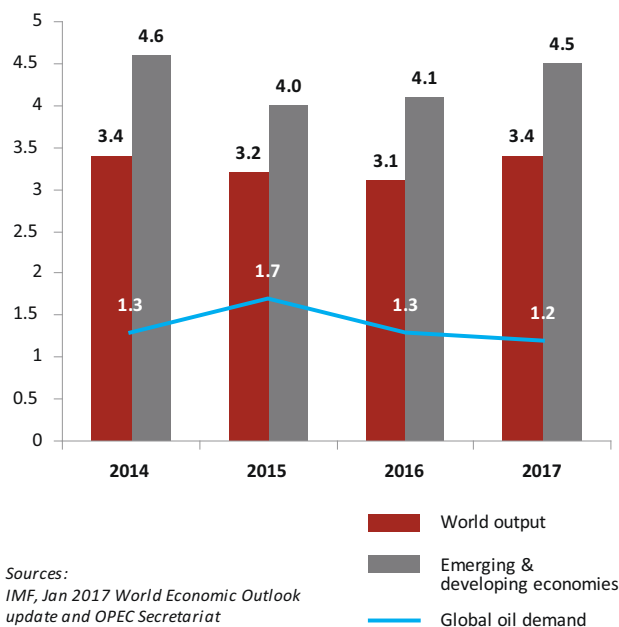
Chart 1: OPEC upstream investment plans*



Source: OPEC Secretariat

*Over the medium-term, some 117 projects worth an estimated US\$270bn are being implemented, mostly by core OPEC (GCC) producers

Chart 2: Correlation between economic growth and oil demand growth (annual % change)



Sources:

IMF, Jan 2017 World Economic Outlook update and OPEC Secretariat

time-span – thus impacting near-term supply compared to conventional oil that requires long lead times between investment and production. Shale oil output has added five million bpd to global supply in recent years. The commercial viability of exploring 'stranded' assets increases with sustained high fuel prices.

Turning point for E&P sector?

Capital expenditure (capex) is a predictor of future availability of reserves and supply. The IEA estimates global exploration and production spending fell by 26 and 22 per cent, respectively, in 2015 and 2016 – with cuts totalling US\$300bn.

A plunging exploration budget has resulted in the lowest amount of conventional oil finds (3.7bn barrels) since 1952, according to energy consultancy Wood Mackenzie (WoodMac). This was 14 per cent below 2015 oil finds, while the number of wells drilled was one third of wells drilled in 2014. Moreover, new barrels are needed not only to increase production, but also to offset 'natural declines' in output from ageing fields. Last year, barely one tenth of 2015 oil consumption was replaced. On this basis, HSBC envisages a global supply deficit within a year.

WoodMac in its *Global Upstream Outlook 2017* suggests the tide is turning and E&P spending will rise by three per cent. It reckons exploration investment (a risky activity) could total US\$37bn – albeit down from US\$100bn in 2014. By 2018, the E&P

“The shift from fossil fuels towards renewable energy can also potentially have major implications.”

sector should improve with upstream investment reaching around US\$50bn, growing further still to US\$60bn by 2020. But offshore upstream spending would continue falling (20-25 per cent) this year, versus an estimated drop of one third during 2016. Some 20 energy projects are expected to receive final investment decisions (FIDs),

up from nine in 2016. However, they still fall below the 40 FIDs the industry had approved on average yearly between 2010 and 2014.

The Barclays' survey of 215 international oil companies (IOCs) shows global upstream spending rising seven per cent in 2017, the first hike in three years, while offshore spending will drop further – reflecting day rate reductions, contract cancellations and delayed deliveries for rigs. London-based BMI Research also predicts companies spending 2.5 per cent more on capex this year compared to 2016 and another 7-14 per cent increase in 2018 driven by North American independents, Middle Eastern and Asian national oil companies and Russian

Table 2: Global investments in oil & gas E&P sector

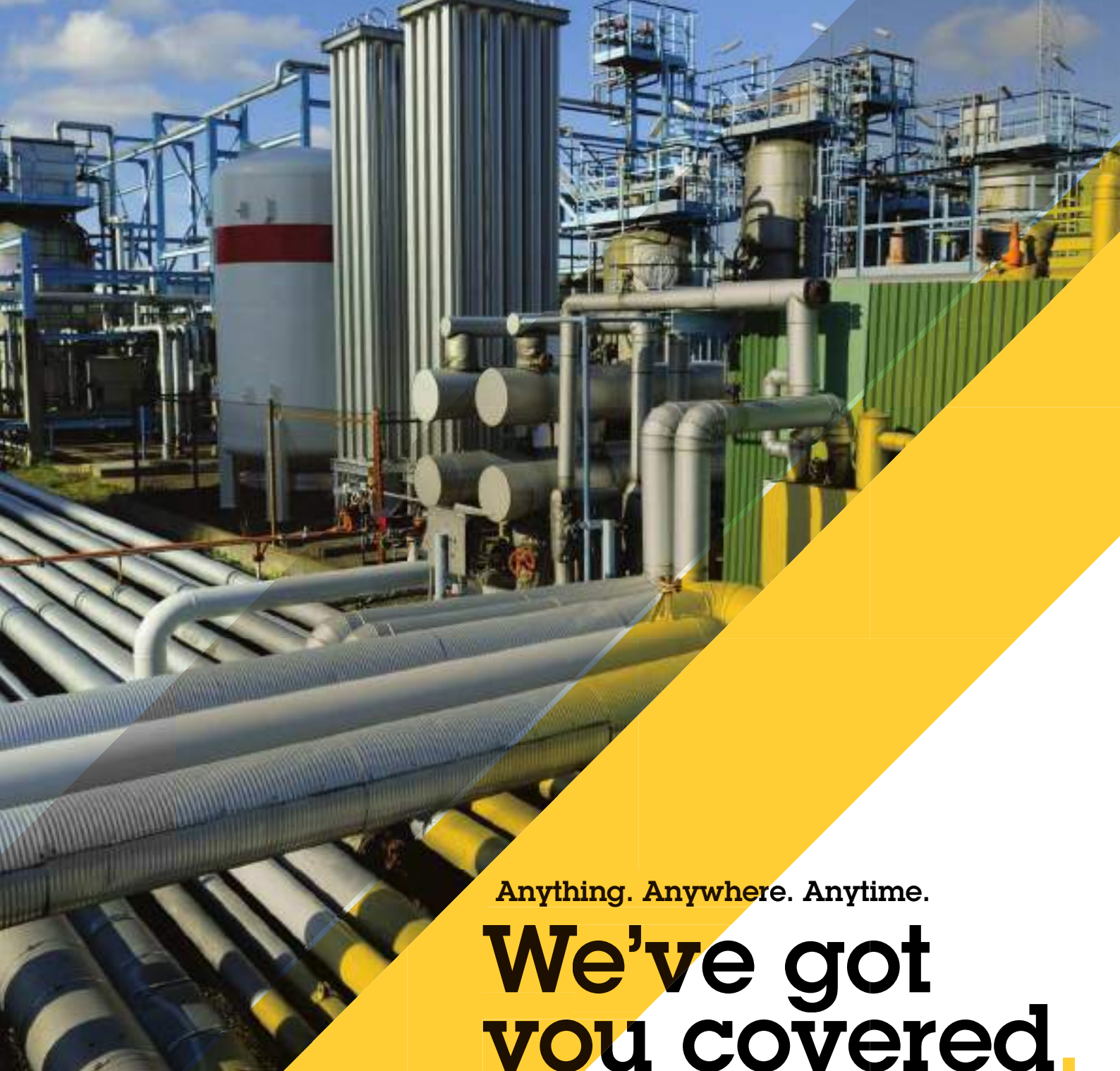
	2014	2015	2016	Est. 2017
Capital expenditure, US\$bn	780	580	450	470
Oil price (Brent) yr-avg. US\$/bbl	98.95	52.41	43.76	mid-50s

Source: IEA.

Notes:

1) Hydrocarbons are finite resources, with high reserve replacement needs. The industry needs to replenish draw down in proved reserves to serve base annual demand of about 33.5bn bbl of oil and 120.5 tcf for natural gas, whilst also meeting annual demand growth of 1-2 per cent and mitigating natural field declines of nearly 7-9 per cent annually. Despite record investments (until 2014), major energy companies were able to replace only 125 per cent of their production over the past decade. While the share of their proven developed reserves fell from 65 per cent in 2007 to 59.3 per cent in 2015, according to Deloitte Market Insights.

2) The industry's future capex requirement depends on how much reserves it adds by exploring (exploration spend) and how much reserves it develops (development spend). Around 80 per cent of capex goes into keeping reserves replacement and developed resources share flat, while growth capex constitutes one-fifth of aggregate.



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firms, outweighing continued cuts from oil super majors.

By contrast, the IEA predicts oil and gas capex could see further declines over 2017 as weaker finances deter new investments. "We estimate that, if new project approvals remain low for a third consecutive year, then it becomes increasingly unlikely that demand/supply can be matched in the early 2020s without the start of a new boom/bust cycle for the industry," warns the IEA. It believes US\$80/bbl is required to ensure a 'balanced' oil market by 2020.

The IEA thinks global investment should rise to at least US\$700bn/year because it takes between three and six years for a new oilfield to start producing. Hence, unless more money is spent on E&D works, the resulting supply crunch may lead to 'over-inflated' oil prices. The OPEC Secretariat agrees: "While the recent oil market environment has been one of oversupply, it is vital that the industry ensures that a lack of investments today does not lead to a shortage of supply in the future."

Structural shifts

A carbon-constrained world, slowdown in emerging markets (particularly China and Brazil), and the removal of fuel subsidies raise fears of tepid demand growth.

These trends, along with the drop in petroleum consumption in advanced economies and the growth of shale, all point to a "lower for longer" scenario for energy consumption and prices, says the International Monetary Fund (IMF). The IEA projects oil demand growing at one per cent compound annual growth rate (CAGR) over the medium term, versus 1.2 per cent during 2010-2015. Cheaper oil-induced demand surge, which rose to a record high of 1.8mn bpd in 2015, is expected to slow to the trend level of 1.2mn bpd this year and next.

Efficiency gains are reflected in lower per capita usage of oil, chiefly in OECD countries – impacting gasoline and transport-related demand. While energy-intensive manufacturing activity in emerging markets is slowing – affecting gasoil and diesel off-take, which accounted for half of oil demand growth in recent years. However, India and China remain the largest contributors to non-OECD petroleum consumption growth. The Gulf region is also a major fuel user.

Over the coming decades, the shift from fossil fuels towards a renewable energy system based on solar photovoltaic (PV), offshore wind, biomass, hydroelectric, fuel cells and nuclear, can also potentially have major implications. Other demand risks for oil-related products come from increased use of natural gas in power generation and transportation sectors, and new environmental rules in advanced economies, which might spur penetration by hybrid and

“Bloated inventories will deplete if backwardation dominates the futures market.”

electric vehicles (EVs).

The cost of solar could drop below US\$10 per megawatt-hour within a decade, making PV the cheapest source of electricity, while cheaper batteries make EVs cost competitive relative to diesel cars, according to Engie SA, formerly GDF Suez (France). WoodMac calculates that EVs could slash one tenth of the world's gasoline demand by 2035 – equivalent to between

one and two million bpd of crude off-take. It estimates that EVs are already displacing about 50,000 bpd today.

Longer-term energy policies could be significantly altered in both developing and advanced economies to meet the goals set at the Paris Climate Conference (COP21) at the end of 2015, to achieve a 30 per cent reduction in greenhouse gas discharges. The Paris Agreement's provisions come into effect in 2021, after the end of the Kyoto Protocol's second compliance period.

Oil futures

Price revival needs the crude futures curve to shift from a situation of 'contango' – where near-term contracts trade at a discount to long-dated deliveries – towards 'backwardation' i.e. where near-term contracts trade at a premium to six months or a year out. The shrinking contango is key to OPEC's strategy for balancing the oil market, whilst reducing stockpiles. When markets are in contango, traders are induced to sit on oil storage and sell it at a future date since they can fetch a higher price. Anticipated profit covers storage costs.

Bloated inventories will deplete if backwardation dominates the futures market over 2017, since faltering longer-dated prices make storing oil expensive. Moreover, backwardation also affects hedging. If futures indicate lower pricing, then there are fewer incentives locking in future production. Concurrently, shale drillers will operate with some uncertainties, most leaving future production unhedged, which, in turn, could force high-cost producers to defer drilling new wells – a strategic advantage for OPEC. Most US shale drillers are heavily indebted. Last year, they raised US\$20bn to mend balance sheets.

A report *The Sea Change: Emerging from a downturn* from industry body Oil & Gas UK neatly summarised oil prospects: "There is a sense that a balancing of fundamentals is approaching which should support a limited oil price recovery. While we are unlikely to see US\$100 prices returning in the medium term, a more robust price (US\$60-70) should be realised in the next few years. Those players that can operate efficiently and profitably in the current environment, while investing in core business areas for future growth, will be the fittest to emerge from the turmoil and most likely reach for the stars."

The industry could turn cashflow positive – if crude remains at US\$55/bbl. In the aftermath of the oil crash, IOCs have become leaner and fitter, with increased focus on smaller, more incremental projects, as well as on balance sheet strength.

Hopefully, the investment cycle should soon show the first signs of growth since 2014. ■

Table 3: Oil price projections, 2017, average Benchmark Brent

	US\$/bbl
Citi Research	59.5
Goldman Sachs	59.0
BMI Research	57.0
Douglas Westwood	56.0
World Bank	55.0
British Petroleum	55.0
Energy Information Administration	53.5
International Monetary Fund	52.5

Table 4: Operating costs by country

	US\$/bbl
Kuwait	4.9
Iraq	5.0
Saudi Arabia	5.0
Oman	5.2
Iran	5.4
UAE	6.0
Qatar	6.5
Algeria	7.0
Libya	7.8
Russia	8.0
Mexico	10.0
Kazakhstan	10.2
Angola	11.0
Venezuela	11.0
China	13.0
Norway	14.0
USA	14.8
Nigeria	15.0
Canada	23.5
Brazil	32.5
UK	40.0

Source: Rystad Energy Research 2014

Note: Exploration and development costs in MENA countries (primarily in onshore fields) are 30-50 per cent less than in other regions.

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STEP 2

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2. Perform downhole well-test with FlowJet for workover quality assurance.
3. Run artificial lift based on FJP&MEFM tool aquired data.
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Egypt's reforms make a difference

Following several tumultuous years, Egypt is hoping that 2017 will prove it has turned a corner, says Samuel Ciszuk.

TERMS HAVE BEEN sweetened, business-friendly governance goals instilled, arrears to producers paid down, and efforts exerted to redress the country's energy balance. Perhaps most importantly, red tape has been slashed. As oil prices seem to be stabilising and strengthening, Egypt might indeed be ripe to complete a turnaround.

Egypt's descent through the ranks of investor attractiveness throughout most industrial sectors in the years immediately following the 2011 Arab Spring events is well known. The following years of political instability and uncertainty further hampered the country's struggle to re-emerge as an investment destination. Oil and gas companies are famously resilient, and those with an upstream presence largely remained. But with a faltering economy, burdened by an evaporating tourist industry revenues and high domestic fuel subsidies, Egypt was finding it increasingly hard to honour its oil and gas contract terms with E&P companies, and started falling into arrears. Gas exports were further curtailed as the government struggled to contain domestic demand growth, thereby depriving gas producers of further lucrative export volumes in exchange for comparatively low domestic government offtake prices. Taken together, there was little reason for companies to invest in Egypt, particularly given the decision-making paralysis, the practical result of the political uncertainty and turmoil.

It is, however, easy to forget that even well before 2011, Egypt had trouble attracting increasingly needed investment to its promising deepwater offshore, EOR projects, downstream initiatives and Western Desert exploration. The last decade of the lengthy Mubarak rule was prone to stagnation and decision-making paralysis too, albeit for different reasons.

Long-promised improvements

As the most tumultuous chapter in Egypt's politics seemed to draw to a close around



*There is potential for increased gas exports.
(Photo: Tom Carpenter/Shutterstock)*

two years ago, the current administration, however, managed to deliver on some long-promised improvements in governance and investment terms, as well as progressing with privatisation and cutting red tape. The government could not afford its energy sector reforms to be unsuccessful, as the country's economy was in a tailspin. For the same reason they were also part of a broader economic reform package, which has come to include sweeping tax reform, a thorough budgetary review and allowing the Egyptian pound to float freely. On the demand side of energy, fuel subsidies, so costly to the economy, were finally slashed in late-2016, raising gasoline and diesel prices overnight by 47 per cent.

With such deep reforms being made throughout the rest of the economy,

momentum could be seized upon to short-circuit processes and deliver change within the energy sector too. New improved upstream agreements have been implemented and signed with 76 companies, as of January 2017. The government has in the meantime also managed to pay down its arrears to IOCs by more than 50 per cent and demands have been put on the bureaucracy to expedite permissioning processes, within demanding deadlines.

The results look promising. Downstream and petrochemical investment commitments at the planning stage have reached US\$17bn, according to government reports, including the long-discussed expansion of Egypt's 100,000 bpd Middle East Oil Refinery (MIDOR) in Alexandria. The project has secured financing from French banks BNP Paribas and Credit Agricole to the tune of US\$1.2bn. Upstream, most companies have actually committed to delivering raised investment levels during fiscal 2016/2017 compared to the year before, albeit from low levels. Naturally the rebound in oil prices plays a very significant part here, but the signs are that the industry is regaining faith in the Egyptian government's ability to deliver on its promises.

“New improved upstream agreements have been implemented and signed with 76 companies.”

Expedited processes

Perhaps the biggest litmus test of Egypt's ability to cut red tape has been its handling of Eni's giant 30 tcf Zohr discovery in the deepwater Nile Delta's Shorouk concession. When Eni announced the mid-2015 discovery in August that year, the government promised its processes would all be expedited to facilitate first production in late-2017. By all accounts, it seems this ambitious timeline has been upheld. Zohr was able to progress from discovery to a signed development lease in around six months and should any first-production schedule slippage occur this year, it seems unlikely that it will be caused by bureaucratic delays.

The fast delivery of Zohr gas to the domestic market promises to alleviate the Egyptian economy's suffering further. With the need to import LNG at peak demand times, Zohr's planned addition of around 0.2 bcf/d will not change the situation radically in late 2017, but as production gradually rises to around 2.8 bcf a year by end-2018, Egypt's gas-to-power supply situation will have been completely changed. This was confirmed late last year, with an agreement allowing for the export of some of the

future Zohr gas through the existing and heavily under-utilised Damietta LNG plant. The attractiveness of Egypt's offshore and of Zohr's potential was further confirmed by the buy-in to the project of both BP and Rosneft, late last year. Moreover, the Zohr discovery has in itself raised investor interest in exploration offshore Egypt, raising the likelihood of additional future discoveries.

Still, it is not all about Zohr, even in the offshore Nile Delta. BP, which has a long history in Egypt, is already developing its five tcf West Nile Delta (WND) project, as well as the Atoll gas discovery. The projects are scheduled to come onstream in 2017 and 2018 respectively, and further alleviate Egypt's tight gas balance. A bold government agreement on higher domestic gas offtake prices a few years ago set the developments in motion, but are today making it possible to again look ahead to rising LNG exports from the Damietta and Idku plants, a further boon to prospective investors.

Onshore too, investments, as mentioned, are rising. This is particularly true of the Western Desert, where Apache has taken the lead and is in the middle of a

US\$900mn 97-well campaign ending mid-2017. The US company's Egyptian Khalda subsidiary achieved record production last year, with 122,000 bpd of crude, 30,000 bpd of NGL and around 840 mmcf/d of gas. Together with the increased spending commitments in both exploration and EOR from other IOCs active in the Western Desert and the onshore Nile Delta, the picture is starting to look optimistic for Egypt's upstream sector.

Arrears remain a problem, however, particularly for the smallest and most cash-strapped players. Egypt will not be allowed to use an imminent US\$12bn IMF loan to pay down arrears, so this problem will remain with the industry through much of 2017. There are hopes for a forthcoming tranche of World Bank funding to help accelerate the IOC debt pay-down.

In total, it seems clear that one would have to go back much further than just the 2011 Arab Spring to see a situation as promising for the Egyptian upstream, which is even allowing markets to again start planning for more LNG and gas exports in the future, as well as enhancing Egypt's potential as a future hub for the re-export of East Mediterranean gas. ■

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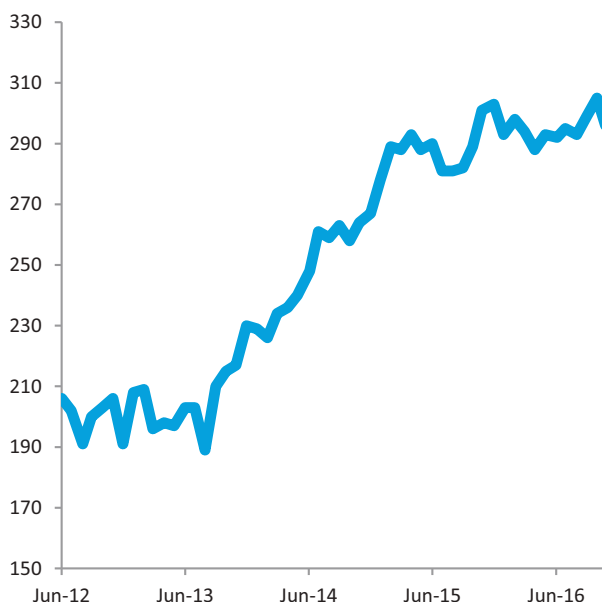
Upstream investment in the Middle East

The core GCC OPEC producers will benefit the most from the upturn in the market, while others will have to play catch-up, says Bassam Fattouh, director of the Oxford Institute for Energy Studies and professor at the School of Oriental and African Studies.

IN A PRESENTATION given at Chatham House in London entitled *Upstream Investment in the Middle East; Challenges and Opportunities in the Lower Price Environment*, Fattouh looks at the dynamics of investment in the Middle East's oil and gas upstream sector.

In contrast to most regions in the world that saw sharp cuts in capital expenditure, investment in the upstream oil and gas sector in the Middle East declined only marginally in nominal terms. Given the cost deflation in the supply chain this meant that activity was maintained and even increased in some countries as reflected in the sharp rise in the rig count, with key GCC producers still on track to achieve their ambitious plans to increase productive capacity and continuing to increase spending (although delays to some projects are possible). Saudi Arabia, for example, is on track to bring more large fields online, and is focusing on the development of its gas reserves, with ambitious plans to increase the share of gas in the energy mix. Abu Dhabi plans to boost crude output capacity to 3.5mn bpd by 2018 with offshore fields contributing most of the output growth, while Kuwait plans to expand capacity to 4mn bpd by 2020, with total expenditure on the energy sector over the next five years projected to amount to US\$112bn.

GCC Rig Count



Source: Baker Hughes

Middle East E&P spending, US\$m

	2015A	2016E	2017E	'15-'16%	'16-'17%
Saudi Aramco	17,280	18,058	18,780	4%	4%
National Iranian Oil Company	10,583	14,817	15,710	40%	6%
Abu Dhabi National Oil Co. (ADNOC)	8,330	8,000	7,200	-4%	-10%
Kuwait Oil Company	5,750	6,000	6,420	4%	7%
Petroleum Development of Oman (PDO)	5,000	5,500	5,775	10%	5%
South Oil Company	3,849	2,683	2,282	-30%	-15%
Qatar Petroleum Company	1,650	1,650	1,815	0%	10%
Missan Oil Company	380	360	360	-5%	0%

Source: Barclays / Global 2017 E&P Spending Outlook

A tale of two regions

But this is a tale of two regions: while GCC producers continue to invest and increase their productive capacity, Iraq has suffered from cuts in investment especially in much needed large infrastructure, adversely impacting oil output growth and plans to increase long-term productive capacity. While the GCC rig count reached record levels in 2016, the rig count in Iraq more than halved from its peak in June 2014 as government finances deteriorated and the government cut spending.

In Iran, progress has been slow and, despite the flurry of deals announced, these are still very preliminary. Without foreign investment and technology, Iran's upside potential from current production levels is limited. The opening of Iran will offer opportunities for IOCs to increase their exposure to a large reserve base, but given the risks involved, such opportunities will likely be captured by only a few companies that have the patience and capability to manage these risks.

It is argued that IOCs' strategies in the Middle East differ fundamentally from each other, with some regarding chasing low-cost Middle East barrels, and increasing their exposure to the region's large reserve base, as a cornerstone of their strategy in a more uncertain world.

The presentation concludes by arguing that during this downturn, the core GCC OPEC producers consolidated their position by continuing to invest in their upstream sector, reflecting their long-term thinking, and hence will benefit the most from the upturn in the market; the rest of OPEC and most of the non-OPEC producers will have to play catch-up. ■

The full presentation can be accessed at <https://www.oxfordenergy.org/publications/upstream-investment-middle-east-challenges/>

A focus on innovation and operational excellence

The 20th Middle East Oil & Gas Show and Conference (MEOS 2017) will take place from 6-9 March 2017 under the patronage of His Royal Highness the Prime Minister of Bahrain, Prince Khalifa bin Salman Al Khalifa.

ORGANISED BY THE Society of Petroleum Engineers (SPE) and Arabian Exhibition Management (AEM), MEOS continues to be a premier platform for sharing E&P knowledge and expertise in the region.

Over 8,000 oil and gas professionals are expected to converge at the Bahrain International Exhibition and Convention Centre to debate the future of the region's oil and gas industry over the course of the conference and parallel exhibition.

"2017 marks the 20th edition of MEOS, building on 38 years of successful and expanding interactions between industry and technical leaders, all in the centre of a region leading the world in energy supply," said Nabeel Alafaleg, MEOS 2017 conference co-chairman and chief petroleum engineer, Saudi Aramco.

"The MEOS conference theme this year is 'Transforming the Industry through Innovation and Operational Excellence'. Fluctuations in the oil and gas markets have made our industry very challenging. Therefore, emphasis on innovation and practising operational excellence has never been greater. This transformation will allow the industry to continue to meet future global energy demand, ensuring continuity of economic growth despite the cyclical nature of the business," he continued.

"We as an industry are entering a new age of transformation through innovative ways of finding and developing reserves. Operators and service companies are identifying opportunities to do more with less through operational excellence while evaluating the financial outcome of their significant investment. This conference will reflect on the importance of industry transformation, and will address it from many perspectives through panels with invited industry leaders, presentations and open discussions," added Michael Bittar, MEOS 2017 conference programme co-chairman and senior director, Halliburton.

Four hundred papers will be presented



MEOS celebrates its 20th anniversary this year

during 50 technical sessions covering topics on reservoir production and facilities, exploration and appraisal, drilling and completions, project management, human resources, business models and HSSE.

A key highlight of the conference programme, the ministerial session, will include regional oil and gas ministers who will look at the global energy picture through the eyes of proactive governments capitalising on the industry's strength to ensure sustainable growth.

“We as an industry are entering a new age of transformation.”

The packed agenda at MEOS also includes an executive plenary session involving leading industry figures discussing the conference theme, an industry keynote session entitled 'Oil Price Volatility: Continue Investing in the Future to Meet Future Demands or Control Cost to Survive?', six panel sessions discussing important matters

relevant to today's industry, and a special workshop entitled 'Women in Leadership—Invest, Initiate, Innovate', featuring influential speakers.

Two one-day training courses entitled 'Advanced Hydraulic Fracturing Design and Treatment' and 'Artificial Lift and Production Optimisation Solutions' will provide delegates with further opportunities to improve technical skills.

A full programme of events aimed at the next generation of oil and gas professionals will meanwhile offer high school students, university students and teachers the chance to engage and gain valuable career advice.

A three day exhibition of oil and gas products and services will run parallel to the conference from 7 – 9 March. Featuring over 200 exhibitors from 30 countries, it covers all areas of the upstream industry; including exploration, development, production, transportation, and processing of oil and natural gas.

Principal exhibitors include GCC national oil and gas companies, who will be exhibiting alongside international supermajors, service industry giants and independent specialist suppliers and distributors from across the globe. ■

Prospering through advances in technology

Duncan Anderson, CEO of Gulf Marine Services (GMS), discusses prospects for the company following the launch of its latest self-elevating support vessel (SESV).



GMS showcased the latest addition to its fleet of SESVs at ADIPEC 2016

A LEADING ATTRACTION at ADIPEC 2016 was GMS Evolution, the latest addition to Gulf Marine Services' fleet of self-elevating support vessels (SESVs). The Large Class vessel, built at GMS's quayside yard facility in Abu Dhabi, is equipped with a revolutionary new cantilever system and offers new cost-effective solutions for work that has traditionally been performed by more expensive traditional drilling rigs. The vessel was jacked up outside the Abu Dhabi National Exhibition Centre (ADNEC), and welcomed a steady stream of visitors over the four days of the show.

Established in the UAE in 1977, GMS designs, builds and operates SESVs, four-legged self-propelled vessels with a large deck space, crane capacity and

accommodation facilities. Over the years the Group has expanded its fleet and geographical coverage to become the foremost player in the Middle East, and is now the largest operator of advanced self-propelled SESVs in the world. Headquartered in Abu Dhabi, the company continues to generate the majority of its business in the Middle East, and also has an operation in Aberdeen to serve the North Sea, as well as

offices in Saudi Arabia and Malaysia.

"Our jack-up barges support operations in the offshore oil, gas and renewable industries," explains Duncan Anderson, CEO. "They can travel at a speed of up to eight knots, jack up on the sea bed and provide a stable platform for oil and gas operators to conduct their well intervention and topside maintenance activities." The barges, which are furnished with equipment to access the well and enhance well production, can operate in depths of up to 80 metres, and are therefore well suited to the shallow waters of the Gulf, he adds. "The trend now is towards enhancing oil recovery in existing wells, both on and offshore, rather than developing resources in more expensive deep water – that's where we fit in very well."

One of the most important features of

“We’re very proud of the fact that we build our vessels ourselves at our yard in Abu Dhabi.”

the vessels is that they can move independently, with no requirement for anchor handling or tug support, which reduces both the length of time to be ready for deployment at the required location, and the costs of getting there. "Our asset is a specifically designed, self-contained unit that can move between wellheads without any assistance whatsoever," comments Anderson. "So it's very cost-effective compared with a drilling rig and because it's jacked up, unlike a ship, it uses very little fuel and so also provides a relatively environmentally friendly way of accessing the wellhead.

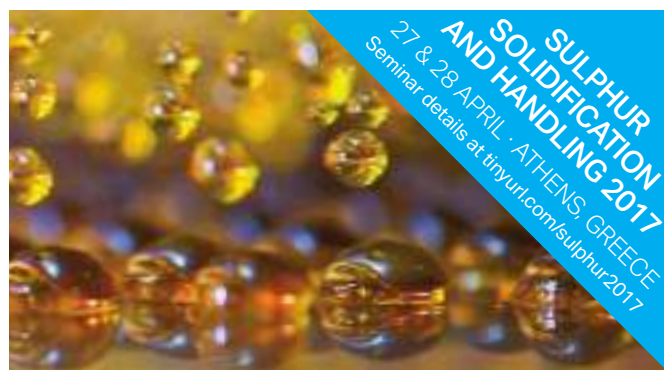
"We are very proud of the fact that we build our vessels ourselves at our yard in Abu Dhabi," he continues, adding that the company's extensive new build programme since the current management team took over in 2007 has made the GMS fleet the most sophisticated in the industry, equipped with the latest positioning systems and satellite technology for safe and efficient operations. "We have pioneered the use of positioning systems such as differential GPS and laser systems with a target on the wellhead, which allows us to manoeuvre within half a metre of the wellhead tower safely," he says.

Now the focus is on expanding well intervention capabilities to offer an increasingly attractive alternative to the traditional drilling rig at a time when cost efficiency is the name of the game. "Our new SESV cantilever system which we are commissioning in GMS Evolution, is the first of its kind in the world; a large steel beam which deploys over the wellhead, it can access the well in the way a drilling rig does," says Anderson. "Whereas in the case of a traditional rig it can take two or three days to set up on location and deploy equipment on the wellhead with the additional expense of utilising tugs, we can deploy the cantilever in around an hour, so the whole set-up process can be carried out in less than one day. So not only are we efficient at moving and jacking up, we actually have the heavy duty equipment that can access the well more quickly than in the way a drilling rig does. We see that as a way of differentiating ourselves from the competition, and this is how we're planning to expand our business going forward."

Safety first

GMS prides itself on its outstanding safety record, where several years' incident-free experience of harsh weather state-of-the-art units for the North Sea offshore oil, gas and renewable industries have stood the company in good stead. "The North Sea safety case requirements are very demanding and we were able to use that valuable experience across our global operations, which has validated our position as a premium operator," says Anderson. "The standards in the Middle East, certainly in the case of our clients, are very high, and we've seen very few serious incidents in the region since we've been operating here. We see our clients embracing the need for safety case documentation, and they are well advanced with risk assessments and hazard identification processes. The more demanding the health and safety requirements, the more it benefits us as a premium operator, with a modern fleet that pushes the boundaries of technology. We sit on bodies that look at command assessment and contribute advice based on our experience of operating barges. We've introduced an 'over the shoulder' assessment to the Middle East and to jack-up barges worldwide along the lines of those used by airlines, and have worked closely with Abu Dhabi Ports Company to develop simulator software technology. So we've been at the forefront of improving health and safety in the region."

The future looks bright, indeed the company is now following up enquiries received at ADIPEC where it reported interest not only from the Gulf but also from shallow water operators in areas such as the North Sea and South East Asia. And it is now seeing an upturn in tender opportunities in the Middle East, with recent contract wins increasing its total backlog by around two thirds since 1 November 2016. This demonstrates that the market is showing clear signs of recovery, GMS reports. ■



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A proactive approach to well integrity

Erik Axelsen of Archer, the global oilfield services company, outlines the benefits of a new approach to well integrity.

THE FOCUS ON well integrity in the Middle East today can be put down to two major drivers – the unique characteristics of many Middle Eastern fields and wells, and the negative implications of failures in well integrity.

Firstly, many Middle East fields today are classified as ‘mature’ with an ageing well stock and many of the technologies that surround them having originally been deployed decades ago. The result is that such fields and wells are vulnerable to completion failures, unstable formations, corrosion, and – probably the most common well integrity issue – leaks. Such leaks are often found in numerous components of the wells, namely tubulars or valves.

As a case in point on the age of Middle Eastern wells, in a recent paper Konstantinos Christou of the University of Aberdeen pointed to the lack of stainless steel being present in the commercial completion industry in the 1950s and 1960s in the Middle East. The result has been increased corrosion challenges (a particular threat in the Middle East since the Arabian Peninsula sits on large saline shallow aquifers) and more leaks. Estimates show that integrity failures affect at least 40 per cent of wells worldwide and the Middle East is no exception.

The second key driver towards enhanced well integrity today is the negative implications of well integrity failures. While Macondo continues to stand out as a worst-case scenario example, it is clear that well integrity failure can endanger lives, pollute the environment and have a highly negative impact on production and the bottom line. This also includes wells being shut-in – as is often the case with casing leaks, for example – and unproductive well downtime.

So how are Middle East operators facing down the challenge?

Too often a reactive process

It is my belief that – despite the undoubted technology developments in well integrity over the past few years – well integrity still



Archer engineers in the field

tends to be characterised too often as a reactive process.

By this I mean that well integrity challenges are addressed as and when they represent a risk – with a focus on specific well integrity issues, such as leaks and barrier conditions – rather than the entire system that surrounds well integrity.

“Well integrity still tends to be characterised too often as a reactive process.”

While a well with perfect integrity tends to behave according to its design, with fluid flowing only where it is intended and where pressures in well cavities are at normal levels, if integrity barriers fail or leaks occur the whole integrity dynamics of the well can fail. It is only by understanding the dynamics and long-term behavior of the well that the precise locating of both leaks and flowpaths throughout the well can be targeted and well integrity failures addressed.

This is what we call integrity dynamics – an understanding the behaviour of the well system in response to its integrity and, alongside reservoir and production dynamics, the third crucial pillar in reservoir management. It is only through knowledge of integrity dynamics that operators can unravel, decipher and describe what is happening in the well and locate integrity failures successfully.

The Point System

This focus on integrity dynamics underpins Archer’s recently launched Point® system. Deployed proactively and systematically at the surface and downhole, the Point System embraces the concept of integrity dynamics to describe what is happening in the well and precisely locate the smallest integrity failures.

The Point System consists of seven diagnostic programmes underpinned by Archer’s proprietary ultrasound technology. Programmes are based around CheckPoint®, which is deployed at the surface to validate integrity or to investigate a known integrity issue; LeakPoint® that goes downhole to

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locate barrier leaks; and FlowPoint®, that locates barrier leaks and flowpaths throughout the well system. Here, we focus on LeakPoint and how it fits into a broader concept of integrity dynamics.

Leaks represent the greatest threat to well integrity. They can reduce a well's performance throughout its life and cause serious safety, environmental and reputational issues. With legacy leak detection methods such as temperature or acoustic noise logs, the reliability of diagnosis can also vary. Low-rate or multiple leaks as well as leaks beyond the primary tubular are particularly more challenging to detect, for example.

To this end, the LeakPoint programme is able to expose leaks in the primary tubular and surrounding casings or completion equipment clearly, reliably and consistently, with the resolution and precision of ultrasound, and the immunity of 'noise' from other parts of the wells, meaning that leak signatures are clear and can be pinpointed accurately. Unlike conventional methods, LeakPoint detection technology is sensitive to a wide range of leak rates and locations – from 0.02 to >5,000 l/min. More complex leaks beyond the A-annulus can also be diagnosed – even while a well is flowing.

Locating a low rate casing leak, onshore Oman

One Middle East LeakPoint application comes from a deep, onshore gas well that since 1999 had had a history of sustained pressure in the A-annulus and intermittent pressure in the B-annulus. In 2006, the pressure increased to 2,500 psi, exceeding acceptable limits and prompting an investigation by the well integrity management department.

Investigation started with an annular pressure survey and the data collected indicated a gas leak rate into the A-annulus at 3.5 litres per minute.

This is a particularly low leak rate to detect, made even more challenging by its intermittent nature and suspected location beyond the primary tubular. Surface investigations also indicated the likelihood of a leak or leaks beyond the primary barrier, and the possibility of an annular flowpath.

The LeakPoint®/A30 programme was therefore selected to locate all barrier leaks as a first step in understanding the integrity dynamics of the well. The LeakPoint®/A30 logging platform was deployed downhole on an electric wireline in surface readout mode to enable real-time monitoring. Tubing pressure was maintained at 3,800 psi and – before commencing – the A-annulus was bled to 0 psi. The build up of A-annulus pressure was carefully monitored while logging at 30ft/min.

It was crucial to maintain sufficient differential pressure across the leak to keep it fully active throughout the survey. At 7,830 ft, a clear leak signature appeared on the log and this was subsequently confirmed with station logging across the zone. The location of the



A high-precision acoustic sensor is a key element of the Point System service

leak correlated exactly with a stage cementing Diverter Valve [DV] tool in the 7-inch casing. The well history showed the DV had previously failed a pressure test and further investigations at the surface confirmed that the leak was not in the tubing.

In this way, the LeakPoint programme accurately located a small leak at the DV tool with analysis concluding that gas was leaking through the DV tool after channeling through a flowpath in the cement below the DV.

The well was scheduled for a workover and a cement evaluation log confirmed poor cement below the DV tool, validating the diagnosis. A secondary cement job was performed and a new completion deployed. This resolved the integrity failure and the annulus pressure problem with this integrated approach to the dynamics of the well, restoring the well to normal production.

“Leaks represent the greatest threat to well integrity.”

A different approach

The industry is at a tipping point with a need to adopt a different approach to well integrity – one that elevates well integrity dynamics to the same level in field development as reservoir and production dynamics. Get this right and Middle East operators can look forward to a reduction of integrity risk, earlier restoration of well productivity, and significantly improved profitability. ■

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Record reservoir lateral drilled in Oman field

AN OPERATOR IN Oman recently drilled a record horizontal production lateral with the deployment of a drilling fluid from Halliburton that helped provide effective fluid loss control as well as reliable wellbore and formation stability.

The Wadi Latham field in northern Oman has been extensively developed with advanced techniques, including extended-reach drilling (ERD). An operator planned an ambitious target to drill a reservoir lateral in excess of 7,000 feet (2,134 metres) long. The reservoir was a low-pressure limestone that was very susceptible to fractures and losses. Losses in excess of 5,000 bbl had been encountered in previous wells.

The challenge was to provide a fluid that could provide excellent filtrate control and the capability to combat seepage and loss while maintaining minimum density.

An engineered BARADRIL-N[®] reservoir drilling fluid system was specially formulated for effective bridging to minimise risks of lost circulation and sticking. BARADRIL-N fluid is a clay-free, acid-soluble reservoir drilling fluid which can be customised to provide effective fluid loss control and reliable wellbore stability by using sized BARACARB[®] bridging solids. A freshwater formulation was developed for this application to minimise fluid density. The BARACARB bridging system was optimised for both loading and particle size distribution in order to minimise the risks associated with lost circulation and differential sticking in the sub-pressured formation.

The well overburden was drilled using a synthetic oil-based fluid. This was displaced with BARADRIL-N fluid prior to drilling the reservoir lateral. The well was drilled to total depth (TD), including a horizontal lateral 2,256 metres long at an average rate of penetration (ROP) of 30 metres/hour. This was achieved without delays or issues. Lost circulation and differential sticking issues were completely avoided, with non-productive time (NPT) recorded.

The well established a local record for lateral length, and the BARADRIL-N system continues to be used successfully in this field, says Halliburton.



A reservoir lateral in excess of 2,134 metres long was drilled with the help of Halliburton's BARADRIL-N[®] reservoir drilling fluid



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Saudi Aramco and Baker Hughes launch cable-deployed ESP system

SAUDI ARAMCO AND Baker Hughes have announced the first installation of the TransCoil™ rigless-deployed electrical submersible pumping (ESP) system, which is designed to help operators bring wells on production faster and lower the costs associated with installing and replacing ESPs. Because they can eliminate the need for a rig in fields where rig availability is a concern or where high intervention costs can limit artificial lift options, operators can minimise deferred production and lower their overall lifting costs to extend the economic life of their assets.

The TransCoil system – developed in partnership with Saudi Aramco – features an inverted ESP system with the motor connected directly to a new, proprietary power cable configuration, eliminating the traditional ESP power cable-to-motor connection, which improves overall system reliability. Unlike wireline-deployed ESPs, the fully retrievable TransCoil system does not have an in-well ‘wet connection’, which requires a rig to pull and replace if the wet connection fails.

The innovative power cable design

enhances the reliability of the deployment string compared to coiled tubing-deployed ESPs that simply pull the power cable through the coiled tubing. Extensive fatigue testing and thermal growth analysis were conducted at the Baker Hughes Coiled Tubing Research and Engineering Center to enhance materials selection and system design. The TransCoil system cable design also extends the operating range to 12,000 ft compared to traditional coiled tubing-deployed ESP systems, which are limited to approximately 7,000 ft because, at greater depths, the weight of the power cable will cause it to collapse inside the coiled tubing, creating an electrical failure.

The TransCoil system can be installed in 4½-in. to 9-in. casing in wells with flow rates up to 18,000 bpd. In mature offshore fields, where high intervention costs can limit the application of ESPs, the system can be deployed through the existing 4½-in. tubing, saving the time and money required to pull the existing completion. Another advantage of the TransCoil technology compared to wireline-deployed ESPs is that it can be installed through a deviation in the wellbore.

This capability allows operators to land the ESP closer to the producing zone for greater reservoir pressure draw down and reserve recovery.

A TransCoil system was recently installed and commissioned in Saudi Aramco’s Khurais field. Rig-based work to replace the completion and install a vertical electrical penetrator system was completed ahead of the rigless operations. A Baker Hughes coiled tubing team helped plan the operation, delivered a surface unit to the wellsite, and worked with artificial lift engineers to install the TransCoil system at 4,900 ft in 7-in. tubing. The first-time rigless operation improved efficiency by reducing installation time nearly 50 per cent over a rig-based installation and further deployment efficiency improvements are expected in the future.

“With a large ESP installation base, including many ESPs installed in our offshore fields, the ability to rapidly deploy ESPs riglessly provides tremendous cost benefits to our overall operations. The TransCoil system is particularly beneficial in our challenging high H2S fields as the premium metallurgy in the system can significantly



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The TransCoil rigless-deployed ESP system
(Photo: Business Wire)

extend the ESP operational life in harsh environment wells," says Mr. Nasir K. Al Naimi, vice president, Petroleum Engineering and Development at Saudi Aramco. "Collaboratively working with Baker Hughes, we have developed a solution that meets our immediate challenges and enables our long-term vision of one-day ESP change outs. We will push the envelope more to have the remaining part of our vision, which is to have 10-year ESP service life."


"Working together with Saudi Aramco, we have addressed the industry's critical need for a reliable alternative deployment option that reduces the cost and time associated with deploying ESP systems without introducing new potential failure modes," says Ryan Moore, vice president, Artificial Lift Systems at Baker Hughes. "In the new normal for oil prices, this technology can be game-changing for operators looking for pathways to extend the productive life of their fields."





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Data - transforming the digital oilfield

Companies need to adopt an integrated approach to digitisation, says Mohammed Riaz, managing partner, IBM Global Business Services, Gulf, Levant and Pakistan.

IT IS NOT difficult to understand why data analysis has become central to drive revenue growth and efficiency, an approach used across industries to develop insights that shape business decisions. The energy sector is a perfect example of an industry that has to collect and analyse an enormous amount of data, from operational data to maintenance data. Yet most companies are still trying to define a clear approach on how to generate their digital footprint and how to derive value from all this data, with varying degrees of success.

The challenge becomes more complex as data volumes and streams increase and multiply. As countless components, devices and instruments become coupled with sensors that send real-time data thanks to IoT (Internet of Things) technology, the pressure builds on CIOs and CTOs to design and deploy an ICT infrastructure that can make use of all this data to deliver better operational and business value.

In an example of its simplest application on a typical engineering project, analytics

“The energy sector is a perfect example of an industry that has to collect and analyse an enormous amount of data.”

and data management solutions offered by IBM have the potential to halve the costs associated with document handling. Within the oil and gas sector, companies spend a significant percentage of a project's total cost on reporting. When looking at an average billion-dollar capital project, the cost of managing documents and data could reach tens of millions of dollars. Through this solution, a company could shave these costs in half, further stressing the importance of the right approach.

At a more advanced level, data enables an energy company which has embraced a digital transformation to analyse and gain insights across its assets which can lead to the extended life of important components and expensive instruments. This in turn increases investment returns from the assets, delivering operational excellence and a positive financial impact. The ROI is further amplified when the transformation is approached across verticals.

Let's look at a single component as an example – a field pump, where the data that pump produces feeds information that is crucial to its ongoing maintenance, and where the pump's failure can affect the entire system that the pump is connected to. In such a critical workflow, you must have an integrated view of the entire system; the pump that may need replacing soon, the location and availability of the replacement part, right through to the availability of the engineer with the right skill sets to change that pump.

The underlying problem is that many companies look for solutions that meet

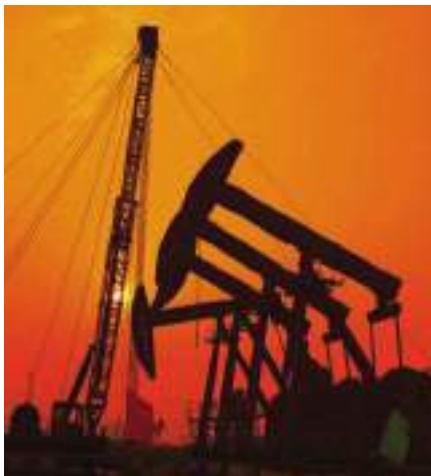


Mohammed Riaz

some of the analytics requirements, collecting data from disparate systems that then need consolidation tools to present data in a single unified view. The drawback of this is complexity and cost, not to mention that adding another application layer comes at the expense of infrastructure agility and performance efficiency.

For companies to gain real long-term value from data, they need to take an integrated approach with a view on how all the components – the processes, people and technology – come together. This is the most effective way to ensure that digitisation of each component or process is harmonious with the needs of both the IT and the business. The digital transformation begins to take form as the company starts with small digitisation steps, one component and one sensor at a time coupled with cognitive analytics tools, and where it starts to see immediate returns in operational performance and on its asset investments.

With the era of digital oilfields upon us, energy companies are taking small yet crucial steps to enable equipment to contribute to the overall performance of the business, one sensor at a time. The trend we are seeing is an evolution where vertical integration is combining with cognitive analytics to reach a higher maturity of digital capability, offering new levels of visibility and even predicting future events before they happen. ■



Energy companies which embrace digitalisation can gain insights across their assets, thereby increasing investment returns. (Photo: huyangshu/Shutterstock)

Refining and petrochemicals - better asset management

Colin Chapman (president) and Ekaterina Kalinenko (project manager) at Euro Petroleum Consultants (EPC) discuss strategies for improving safety and margins through better asset management.

OVER THE YEARS, the overall asset performance of refining and petrochemicals facilities has been steadily decreasing and producing lower margins. This is down to a number of factors including multiple unplanned shutdowns, in some cases due to major incidents; overcapacity in many regions, leading to increased competition; and decreasing demand.

Despite this trend, we are seeing renewed activity on new projects in certain regions, most notably in North America where refiners have embarked on revamping assets to adapt to changing feedstocks. Elsewhere, the Middle East is a major investor in new capacity; Iran, for example, is focusing on major investment projects for all its refineries if financing can be secured. Asian and South American countries are trying to allocate their resources to meet growing internal demand while at the same time continuing to supply export markets. Today's difficult environment means that it is critical for refiners to maximise their competitiveness in order to maintain and improve their margins. Many regions have a real opportunity to improve the efficiency of existing assets with relatively little investment.

There are various implementation areas related to asset management (see Figure 1) that companies have addressed over the past few years, and many have achieved some impressive results. This is especially true for those refiners that adopted a holistic approach and full-on strategy for enhancing key business processes in areas such as energy efficiency; operational and mechanical availability; crude slate and product basket optimisation;



Refinery efficiency can often be improved with relatively little investment.
(Photo: anekoho/Shutterstock)

cutting of non-productive expenditures; and informatisation and automation of production.

Concern for safety

One major concern for all refiners today is safety. We have seen serious accidents in the Middle East, Russia, Europe and the USA over this past year. It is vital for companies to implement full in-depth reviews of existing assets. Safety must always be the top priority.

“ It is vital for companies to implement full in-depth reviews of existing assets.”

It is important for companies to understand the limitations of main pieces of equipment to better understand how to operate safely today and in the future. This requires carrying out in-depth audits of each operating unit. Audits may be carried out by using a company's own resources or by engaging a third party company to get an independent opinion on the real condition of the equipment and also receive professional recommendations on the areas that need improvement and the extent to which efficiency increase is possible.

Different approaches can be applied to asset (data) management, using both in-house and third party sources – many companies use both.

The full programme of introducing new methods and techniques can take at least three years and is usually carried out in three phases - design; implementation; and support and development.

Once the design phase is complete, any necessary changes

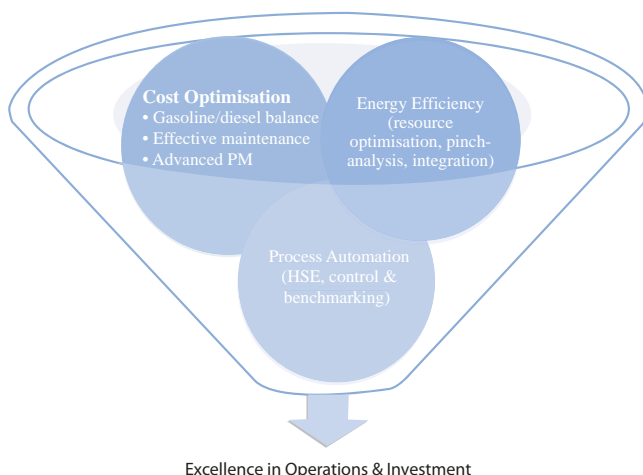


Figure 1: Elements of efficient management of data and assets.
Source: Euro Petroleum Consultants

should be implemented during construction and commissioning phases, including testing, finalisation of procedures and verification of documents and key elements such as safety layers and barriers, e.g. valves, isolation, emergency alarms, etc.

During operation, all asset integrity system elements should be maintained by operators and HSE managers. New operational limits should be explored and change management procedures should be put in place and reviewed when operating conditions change. It is important to have a proactive approach that imposes preventive measures to maintain high levels of safety and reliability. Reporting and documenting any changes and important incidents or interventions is critical in order to monitor the asset through the lifecycle.

Companies should look to carry out a diagnosis (see Figure 2) of the present situation and prepare an action plan and strategy to improve the performance of the asset. Some critical areas include optimisation of turnarounds to reduce downtime, and reducing maintenance costs by effective inspection and improved monitoring systems to mitigate risks and unscheduled maintenance.

Traditionally, methods used for asset integrity assurance include gap analysis and benchmarking, inspections and audits, corrosion evaluation, review and maintenance, and integration of processes with software tools. To maximise productivity, a list of key performance indicators (KPIs) can be developed, that incorporates HSE indicators, which are applicable to the asset integrity condition evaluation.

By extending the life of critical assets, inventory costs can be lowered in a rational manner, resulting in significant savings. These can create synergy with increased margins and provide a pathway to

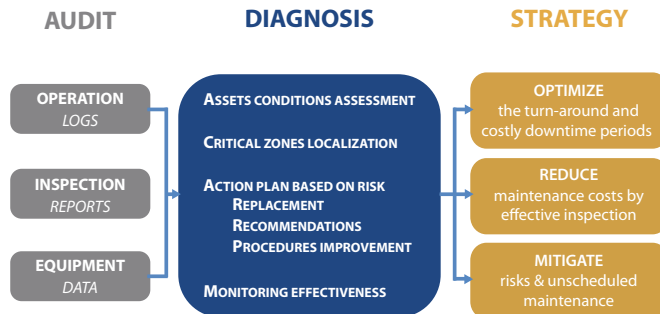


Figure 2: Assets audit and diagnosis. Source: Wintech Global

success. Asset management services should enable a company to manage its assets and systems in a sustainable way, to optimise performance and expenditure with minimal risk over the full lifecycle of the facility and to maximise returns on their investment.

Essential items for ensuring best possible success in the implementation process are:

- Team and Communication
- S.M.A.R.T. objectives and tasks
- Transparent performance monitoring and analysis
- Being open to innovation and discussion.

Diligent work on maintaining a competitive level of asset integrity should not be seen simply as increasing costs in order to save equipment from inevitable decay – some companies previously preferred to purchase new equipment items rather than spend extra on capital-intensive assets during their lifecycle. But in the present economic context, owners are more inclined to make rational investment decisions.

“An ‘asset-conscious’ approach is now being introduced in all processing industries.”

An ‘asset-conscious’ approach is now being introduced in all processing industries and has already brought significant change to the oil and gas business. By improving reliability we improve safety, reducing the risk of accidents due to leakage, equipment failure, etc. and lowering the risk of major accidents occurring.

When looking to improve operations refiners will need to focus on a number of key project areas, including:

- Safety: training simulators and remote control, hazops, process safety management training
- Production costs: in-line blend optimisation, loss reduction programmes
- Margin: maximum throughput and yields
- Margin: proactive maintenance strategy – help reduce unscheduled shutdowns
- Margin: unified supply chain management. Feedstock optimisation and product slate optimisation to meet market requirements.

The economics for these types of projects are generally quite attractive – investment levels required range from US\$10mn to US\$15mn per plant with an estimated payback period between six and 18 months, and estimated annual profit (including savings) reaching US\$10mn to US\$15mn minimum.

To be competitive, the 2020 refinery will need to be safe, reliable, clean, adaptive and Smart. ■

EPC is a technical oil and gas consultancy with offices in Dubai, London, Moscow, Sofia and Kuala Lumpur. EPC also organises leading conferences including OpEx MENA – Operational Excellence in Oil, Gas & Petrochemicals. For further details please visit www.europetro.com.

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Accelerating IoT initiatives

IFS and The Marsden Group are collaborating on an IoT offering for the oil and gas sector.



Oil and gas companies will be able to monitor, capture and analyse relevant IoT data. (Photo: Panchenko Vladimir/Shutterstock)

IFS, THE GLOBAL enterprise applications company, and global IoT technology company The Marsden Group have signed a strategic partnership to jointly pursue opportunities in the oil and gas industry.

The Marsden Group is a global technology company specialised in developing advanced analytics in support of IoT solutions for the upstream oil and gas market. From its offices in the USA, Europe, and Australia, the company serves some of the largest companies in the oil and gas sector.

The combination of the IFS IoT Business Connector and The Marsden Group's platform for IoT data discovery, machine learning and advanced analytics, oil and gas companies are able to monitor, capture, and analyse relevant IoT data, enabling timely action and optimised decision making in

critical areas such as maintenance and supply chain management.

"We are excited to announce our partnership with The Marsden Group, which is a highly visible and well-respected brand in the oil and gas sector," IFS Global Industry director for Oil and Gas, Hege Wroldsen said. "The Marsden Group brings long and deep industry experience, which is evident in the comprehensive nature of its IoT offering. Together, we will be able to offer a solution that de-risks and accelerates IoT initiatives."

The Marsden Group president, Andrew J. Pratt said, "By working together, we will be able to bring to market a comprehensive solution based on industry best practices. This means empowering customers with the right data at the right time in order to trigger the right action. For the asset-intensive oil and gas sector, IoT brings invaluable benefits in areas such as predictive maintenance and supply chain management. We look forward to a long and mutually beneficial partnership with IFS." ■

More information can be found here:
www.ifsworld.com/corp/industries/oilfield-service-software/

“For the asset-intensive oil and gas sector, IoT brings invaluable benefits.”



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Eilbeck Cranes launches explosion-proof hoists for demanding environments

IN RESPONSE TO an increasing demand for quality lifting equipment for the oil and gas industry, Australia's Eilbeck Cranes has introduced its new line of explosion-proof hoists, the ES Series. The new hoist series has been designed with modularity in mind to enable quick and precise application of the most suitable materials for onshore, offshore, hazardous and corrosive environments. The hoists are classified in models based on their capacity and application, with serial models including the range ES20 to ES60, with the custom-designed open winch model ES80 going up to 160t capacity.

With a robust but compact modular design offering a wide range of hook paths and lifting speeds incorporating FEM, ISO, AS, ATEX and IECEx standards, the ES hoist's modern design is centered around reliability, durability and easy maintenance, which makes it a world class product yet at a competitive price. There is a wide range of realistically priced optional add-on items to meet specific project requirements.

These specialty hoists are manufactured by Eilbeck in its purpose-built state-of-the-art CNC machining factory. Every component and



The hoists are tested to the most stringent international standards

commissioning-ready product that comes out of Eilbeck's production line is tested in-house to the most stringent international standards and project-specific requirements.

Recently, Eilbeck Cranes supplied ex-proof cranes for the JSC Yamal LNG Project. This has been one of the most complex liquefied natural gas (LNG) projects ever undertaken because of its location above the Arctic Circle, a region that is icebound for seven to nine months of the year.

After having supplied LNG tank cranes to Entrepose for projects in Nigeria, Algeria and for Chevron's Wheatstone Project in Australia, Eilbeck Cranes was commissioned again by Entrepose when it sought a technical proposal for the four LNG tank jib cranes and four auxiliary jib cranes, to include a comprehensive solution suitable for operation in such a harsh environment. Awarded the contract, Eilbeck Cranes commenced detailed engineering design ensuring integrity of the cranes and hoists at a temperature of -50°C and operating temperature of -36°C. The resulting ex-hoist was constructed from Swedish SSAB steel, satisfying minimum Charpy V-notch impact tests of 27J at -50°C and offering 100 per cent redundancy to minimise risks when carrying out the delicate LNG pump replacement exercise.

Eilbeck Cranes has a 110-year history of engineering and manufacturing excellence in the Australian lifting industry, and is recognised worldwide by companies such as Shell, Total, BP, Statoil, Inpex, Petronas, Qatar Petroleum, Woodside, Technip, Bechtel, JGC, Chiyoda, Fluor, Saipem and Akersolutions.

Samoco Oil Tools introduces new BOP testing tool

SAMOCO OIL TOOLS, developer of tools for the oil and gas industry, has launched OneTrip to reduce the time and costs associated with mandatory blowout prevention (BOP) testing. The company collaborated with Shell Offshore Engineering to engineer, manufacture and test the new tool.

Nearly seven years ago, federally-mandated testing protocol required operators to test the integrity of their BOP equipment every 14 days. While operators have complied for years, no one in the industry has been able to complete the test in one trip, until now.

"These stricter protocols are essential to a rig's safety and ultimate success as testing detects potential problems that can endanger rig workers and the environment," said MJ Hellail, CEO of Samoco Oil Tools. "BOP testing is also very expensive for energy producers. Operators must interrupt rig operations for 36 to 72 hours each time they perform BOP testing. That is where we identified the need for a solution like OneTrip."

Traditional methods perform three separately staged subtests of the BOP's large RAM, small RAM, and sheering capabilities which require testing tools to run multiple 'trips' along the BOP stack. OneTrip's proprietary design enables the testing of all three during a single trip down the hole. OneTrip's additional BOP testing capabilities include –

- A low torque, high-pressure seal design to ensure a resilient downhole seal that can withstand harsh subsea conditions
- Ability to withstand 25,000psi test and sustain a load up to 1.2mn lbs.



OneTrip® by Samoco Oil Tools

- Technology that holds OneTrip downhole until BOP test results are confirmed satisfactory.

"OneTrip is proven to provide significant savings to drilling operators by cutting BOP testing time in half," said Hellail. "Plus, it has a universal design that performs with any BOP configuration. We can customise the tool's dimensions to match a rig's BOP stack specifications."

Coltraco Ultrasonics launches new portable ultrasonic flow meter

COLTRACO ULTRASONICS HAS introduced its Portasonic™ Portable Ultrasonic Flow Meter. The handheld, portable, clamp-on flow meter device provides accurate flow measurement from the outside of a pipe and measures the flow rate, by utilising two transducers that function as ultrasonic

transmitters and receivers.

It is effective in checking the flow rates of clean non-aerated fluids, such as water, with the ability to measure anywhere on full pipes from ½" to 180" (12 to 4,570mm).

The lightweight, compact and reliable Portasonic™ Flow can penetrate all common

metal and plastic pipe materials with its non-invasive external clamp and provides an easy way to cater for sprinkler system maintenance in the fire industry.

It can be used in a wide range of industry applications and environments, says the company.

Petrotechnics' technology selected for Jazan Refinery in Saudi Arabia

PETROTECHNICS, DEVELOPER OF Proscient – the hazardous industries' first software platform for Operational Excellence, has been selected by Accenture to deliver its solution for Saudi Aramco's new Jazan Refinery complex. Proscient will be implemented as part of Saudi Aramco's integrated manufacturing operations management system (imoms) – a first of its kind digital approach – to reduce risk, improve productivity and lower costs.

The US\$2.1bn refinery will have the capacity to process 400,000 bpd of crude oil and produce 80,000 bpd of gasoline, 250,000 bpd of ultra-low sulphur diesel and over one million tonnes per year of benzene and paraxylene products. This output will help meet Saudi Arabia's domestic energy demand, as well as increase its share of high value fuel exports to international markets. The complex is due for completion later this year.

imoms will be the engine of digital transformation at Jazan Refinery. The system will enable connected, collaborative and safe industrial operations; closing the loop between operations, maintenance and engineering through joined-up processes and smart assets to transform business operations. It is a comprehensive set of 12 applications, 20 integrated solutions and 550 processes encompassing risk management, production management and activity management.

Proscient will deliver the PSORMS capabilities within imoms to

proactively mitigate operational risk and optimise the work schedule dynamically and graphically. It will also facilitate the capture and management of work permits, real-time risk analysis, incident reporting, emergency preparedness and safety response, KPIs and management of change. According to the company, imoms and Proscient will ensure that complex operational data is transformed into meaningful information to provide everyone with the right information at the right time to make the right decisions.

"imoms enables the connected, collaborative and safe industrial operations of the future – today. Proscient is a core component of imoms and will support better decision making," said Massimo Pagella, Managing Director of Resources, Accenture.

"Petrotechnics' long track record and approach to helping oil and gas organisations deliver safer and more effective operations combined with the strength of Proscient made them the best choice for imoms and Saudi Aramco."

"Petrotechnics is proud to have been chosen by Accenture to provide the critical PSORMS capabilities of imoms for Saudi Aramco's new Jazan Refinery," said Iain Mackay, COO, Petrotechnics. "imoms will help realise Saudi Aramco's vision of a 21st century approach to excellence in industrial operations, further solidifying it as a global leader in innovation and operational excellence in the oil and gas industry."

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Progress is Life

Emerson expands reservoir modelling capabilities

EMERSON AUTOMATION SOLUTIONS has launched the Roxar API (application programming interface), its extensibility solution for reservoir modelling for its industry leading software Roxar RMS.

The Roxar API helps operators customise their workflows to achieve specific goals; improves data management capabilities with greater interoperability and flexibility; preserves vital reservoir information across multiple-stage workflows; and enables users to analyse and visualise their models in different and innovative ways for improved reservoir interpretation and increased recovery, says the company.

Using Python programming language, the Roxar API enables operators to integrate their own intellectual property (IP) into reservoir modelling workflows. In addition, applications can be written or extended to access RMS project data. This increased interoperability facilitates communication and information exchange between different software packages, ensuring maximum flexibility and expanding operators' reservoir modelling capabilities.



New service helps reduce risks and costs

ASSTEAD TECHNOLOGY'S NEW service increases efficiency and drive down risk and cost in subsea and marine operations, says the company.

By applying its engineering and technical know-how to solve specific subsea challenges, Ashtead has already delivered integrated product applications to several of its clients and is currently using this approach on projects worth US\$7.49mn.

This has spurred Ashtead on to establish a dedicated Engineered Measurement Solutions Group to focus exclusively on this solutions-based approach to complex applications, including attitude monitoring, vibration and stress monitoring, optical metrology, data communications, engineering data analysis and integrity management.

Ross Macleod, technical director of Ashtead Technology, said, "Ashtead sees a very different future within the offshore sector where cost efficiency is not just talked about but is inherent in every project or operation. Our aim is to provide integrated solutions that reduce vessel-time and allow subsea infrastructure to be more efficiently managed through its lifecycle."

Well-SENSE fibre optics technology tests positive

DOWNHOLE TECHNOLOGY SPECIALIST, Well-SENSE Technology Ltd, has announced a major breakthrough in the progression of its FibreLine Intervention (FLI) technology.

According to the company, FLI offers an entirely new approach to well intervention and combines several innovative concepts in a single package. As a simplified intervention method, it represents a radical advance in downhole tools for the industry, significantly reducing cost and risk.

After a period of intense development, the system has recently exceeded expectations whilst undergoing rigorous testing and trials. It has been proven that fibre optics can be repeatedly and reliably retrofitted into a well using the FLI system, says the company.

An integral part of the testing was to perform distributed acoustic sensing (DAS) surveys across the installed fibre optic line. This demonstrates that the acquisition of quality data from oil and gas wells can be performed in a cost-effective and low risk manner.

Well-SENSE's co-founder and technology director, Dan Purkis, said, "Achieving such positive initial results with FLI is a real milestone for Well-SENSE, and testament to our hard work and dedication in launching it to market."

"We are positive that the technology will offer vast benefits to operators because it's cost effective and disposable – allowing for it to be utilised on wells where other methods of installing fibre optics may have been deemed economically unviable."

"To realise the full benefits of FLI, collaboration with other technology providers will be key to its ongoing development."



ITF steps up action to solve costly pipe-walking problems

THE INDUSTRY TECHNOLOGY Facilitator (ITF) is looking to welcome additional participants to a new joint industry project (JIP) to develop pipeline anchoring and monitoring systems, which could mitigate the risk of pipeline walking and cut pipeline anchor installation costs in half.

The Anchoring Pipeline Technology (APT) JIP currently involves Shell. The initial phase of the project will run for eight months and will bring together major global operators and pipeline installation companies to collaborate with ITF and Crondall Energy, an independent oil and gas consultancy. It aims to investigate alternative and less costly solutions and create a roadmap on how to manage and mitigate the pipe-walking challenge.

Pipe-walking, or axial ratcheting, has been observed on a number of pipelines and can cause integrity concerns, including very large global axial displacements of the pipeline. In some cases, this has resulted in tie-in connector failures or subsea intervention to mitigate or control high rates of walking.

Large suction anchors, with a capacity of around 100 tonnes are installed at the end of the pipeline to control walking. In more recent projects, some long pipelines have required several anchors to be installed over the pipeline length.

The potential overall saving from the deployment of optimised distributed-anchoring systems is expected to be up to 50 per cent of a typical installed cost. For example, this could result in a cost saving of more than US\$5mn for a project planning to install several anchors on a single long pipeline.

The study will complement existing research by using the extensive experience of JIP participants. It will provide design strategies to simplify the design process and present a roadmap for projects to manage and mitigate the walking challenge over the project cycle. This will include the development of a 'wait and see' approach based on effective monitoring of pipeline walking by applying mitigative measures only when and where they are required.

Ben Foreman, technology team lead with ITF, said, "The JIP team already demonstrates a great deal of expertise and knowledge in this subject matter and will work together to develop and test more effective, low-cost pipeline anchoring systems that are simpler to deploy, more cost-effective to install and able to be retrofitted."

ONGC extends life of offshore assets with Bentley SACS

INDIA'S OIL AND Natural Gas Corporation (ONGC) began exploring for oil in Indian waters in 1976, and is currently operating more than 265 offshore fixed jacket platforms in water depths ranging from 25 to 90 metres. Most of these platforms had a 25-year design life, with many of them having already outlived this milestone and many more approaching it. Additionally, modifications on many of the platforms have been made. As a result, the requalification of these structures was highly important to ensure continued oil production. ONGC also wanted to avoid the cost of installing new platforms.

The company has therefore invested US\$150mn to assess its jacketed platforms for extended 'fit for use' and strengthen the platforms as required to meet industry safety requirements. ONGC has used Bentley's SACS software for design-level analysis to carry out detailed structural analyses and SACS Collapse for ultimate strength analysis. This technology became part of ONGC's methodology for platform life extension/requalification, which added 10-15 years to the average life of each structure.

The analysis included dent modelling, member/joint component strengthening, additional pile modelling, and soil convergence, as well as extensive load modelling to recommend equipment removal if necessary. SACS and SACS Collapse, with the efficient multi-run option, allowed multiple analyses with parametric variations to be



An example of jacket platforms in the western offshore region. (Photo: ONGC)

carried out simultaneously and enabled ONGC to optimise the strengthening/mitigation measures, saving at least 12 resource hours per platform.

Dinesh Kumar, GGM, head structures, IEOT-ONGC, India, said, "The wide range of applications offered under the umbrella of Bentley technology has resulted in ONGC being able to manage our offshore assets much more efficiently."

Keller launches new differential pressure transmitter

KELLER AG FÜR Druckmesstechnik is launching the Series PRD-33 X differential pressure transmitter. This features a double sensor for measuring the differential and line pressure independently, highly accurate measurements and a high overload resistance. Combining these benefits opens up new possibilities such as measuring the levels in liquefied gas tanks safely, accurately and at a reasonable price, says the company.

The PRD-33 X has two independent sensors and measures the line pressure as well as the differential pressure. The transmitter achieves its high accuracy level of up to ± 0.05 per cent FS due to its calibration over the entire pressure and temperature range. The mathematical model calculated in this way corrects all repeatable errors. The high level of accuracy is therefore guaranteed as an error band within the overall compensated range. The floating assembly of the sensor unit provides protection from external forces during installation.

Pressure tanks impose particular requirements on pressure

transmitters. The closed systems require two measurements to determine the level: one for the tank pressure and one for the liquid pressure. Thanks to its two sensors, the PRD-33 X achieves this in one measurement process. All transmitter parts that come into contact with the medium are made from high-quality materials such as stainless steel AISI 316L, silicone, gold and silicon. The PRD-33 X is therefore suitable for use with (liquid) oxygen, argon, nitrogen, helium and carbon dioxide.

In the case of cryogenic liquefied gases, tanks that are smaller than three metres can have a differential pressure range of only 200 mbar – with a line pressure of up to 32 bar. With its line pressure compensation of 0...40 bar, the PRD-33 X can tackle this challenging combination with ease. When the tank is being filled or the valve is being used, the entire tank pressure can hit one side of the differential pressure transmitter. The PRD-33 X also copes with the resulting 32 bar uneven overloading with its overload resistance of ± 35 bar.

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Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS - EGYPT

Project	City	Facility	Budget	Status
Burullus Gas Company - West Nile Delta Gas Field	West Nile Delta	Gas Field	12,000,000,000	Engineering & Procurement
PhPC - Atoll Gas Field	Damietta	Gas Field	300,000,000	Engineering & Procurement
Eni - Block 9 (North Leil Offshore)	Mediterranean Sea	Exploration	300,000,000	Engineering & Procurement
ASORC - Hydrocracker	Upper Egypt	Hydrocracker	1,500,000,000	Engineering & Procurement
ASORC - Naphtha Complex	Asyut	Continuous Catalytic Cracker (CCR)	3,700,000,000	EPC ITB
SUMED - Ain Soukhna Product Hub (ASPH) Project - Tank Farm & Topside Facilities (LOT 2)	Ain Soukhna	Oil Storage Tanks	150,000,000	EPC ITB
AQFCIC - EL-Wady Complex for Phosphate and Compound Fertilizers	Abu Tartor	Ammonium Phosphate	900,000,000	Feasibility Study
ENI - Nooros Exploration Prospect (Abu Madi West)	Nile Delta	Gas Field	2,000,000,000	Engineering & Procurement
BP - West Nile Delta Gas Field - Gas Reception and Processing Facility	Various	Gas Processing	1,000,000,000	Construction
Petro Shorouk - Zohr Gas Field Development	Mediterranean Sea	Gas Field	7,000,000,000	Construction
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
ERC - Mostorod Refinery	Mostorod	Refinery	3,700,000,000	Construction
EHC - Tahrir Petrochemicals Complex	Suez	Petrochemical Complex	7,000,000,000	Engineering & Procurement
ANRPC - Continuous Catalyst Regeneration (CCR) Unit	Alexandria	Catalysts	294,000,000	Engineering & Procurement
E-styrenics - Styrenics and Polystyrene Plant Phase II	Alexandria	Polystyrene	460,000,000	EPC ITB
MIDOR - Midor Refinery	Alexandria	Refinery	1,400,000,000	Engineering & Procurement
El Nasr For Intermediate Chemicals - Phosphate and Fertilizer Complex	Ain Soukhna	Phosphoric Acid	600,000,000	Engineering & Procurement
AMOC - AMOC 2 - Lube Oil	Alexandria	Lube Oil	800,000,000	Feasibility Study
SOPC - Oil Production Complex	Suez	Oil Production	500,000,000	Feasibility Study
Egyptian Chemical Company (KIMA) - Aswan Fertilizer Complex (KIMA 2)	Aswan	Ammonia	592,000,000	Construction
AQFCIC - Nitric Acid Plant	Ain Soukhna	Ammonia	160,000,000	EPC ITB
ECHEM - Bio-Ethanol from Rice Straw Project	Kafr El Sheikh	Bio-Ethanol	227,000,000	Feasibility Study
Burullus Gas Company - West Nile Delta Gas Field - Taurus and Libra Subsea Fields	West Nile Delta	Gas Field	550,000,000	Engineering & Procurement
ASORC - Hydrocracking Diesel Complex	Asyut	Hydrocracker	2,500,000,000	Feasibility Study
AMOC - Naphtha and Diesel Units	Alexandria	Naptha	250,000,000	Feasibility Study
Minister of Electricity and Renewable Energy - Western Damietta Coal-Fired Power Plant	Damietta	Gas Fired Power Station	2,400,000,000	Feasibility Study
ECHEM - Alexandria Propylene Derivatives Project	Alexandria	Propylene	2,500,000,000	Feasibility Study
Eni - British Petroleum (BP) - Block 8 (Karawan Offshore)	Mediterranean Sea	Exploration	140,000,000	Engineering & Procurement
Dana Gas - British Petroleum (BP) - Block 3 (El-Matariya)	El-Matariya	Gas Exploration	120,000,000	Engineering & Procurement
Dana gas - Block 1 (North El-Salhiya)	North El-Salhiya	Gas Exploration	70,000,000	Engineering & Procurement
Eni - South-West Melehia Block license	South-West Melehia.	Exploration	40,000,000	Engineering & Procurement

Project Databank

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Project Focus

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Project Summary

Project Name	ASORC - NAPHTHA COMPLEX, ASSIUT
Name of Client	ASORC - Assiut Oil Refining Co
Estimated Budget (\$ US)	3,500,000,000
Facility Type	Continuous Catalytic Cracker (CCR)
Status	EPC ITB
Project Start	Q1-2013
End Date	Q1-2020
FEED	Axens
PMC	WorleyParsons
Award Date	Q1-2017

Project Status

Date	Status
07 Feb 2017	The client hopes to award the contract during Q1 2017. The qualified bidders are: 1- Intecsa - Spain + Hassan Allam 2- CCC - Lebanon 3- Technip - Italy + Petrojet 4- ENPPI - Egypt + Orascom + Foster Wheeler.
Feasibility Study	1Q-2013
Design	2Q-2015
EPC ITB	3Q-2016
Engineering & Procurement	1Q-2017
Construction	1Q-2018
Completed	1Q-2020

Project Scope

The scope of project involves constructing a new naphtha complex at the refinery site comprising a naphtha hydrotreater unit (NHT), a continuous catalytic regeneration (CCR) reformer and an isomerisation unit to produce 660,000 tons of naphtha, 500,000 tons of high-octane gasoline, and 7,000 tons of LPG per year. This will have the capacity to process 14,800 bpd of naphtha to deliver 11,600 bpd of high octane gasoline and 200 bpd of butane.

Project Finance

Islamic Development Bank (IDB) will provide US\$198mn as a loan.

RIG COUNT ←



Middle East & North Africa

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

	THIS MONTH			VARIANCE	LAST MONTH			LASTYEAR		
Country	Land	OffShore	Total	From Last Month	Land	OffShore	Total	Land	OffShore	Total
Middle East										
ABU DHABI	33	15	48	0	32	16	48	25	11	36
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	41	0	41	0	41	0	41	61	0	61
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	52	0	52	8	44	0	44	45	0	45
OMAN	57	0	57	-2	59	0	59	57	0	57
PAKISTAN	21	0	21	0	21	0	21	19	0	19
QATAR	5	5	10	0	5	5	10	2	7	9
SAUDI ARABIA	105	19	124	-1	110	15	125	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	314	41	355	5	312	38	350	309	38	347

North Africa

ALGERIA	51	0	51	0	52	0	52	49	0	49
EGYPT	19	6	25	-2	18	6	24	46	16	52
LIBYA	0	1	1	0	0	1	1	4	3	7
TUNISIA	1	1	2	0	1	1	2	0	3	3
TOTAL	35	8	79	-2	71	8	79	102	9	111

Source: Baker Hughes

IOCs rethink their MENA strategies

WHILE IOCS CONTINUE to play an important role in the Middle East, a number of factors are making them rethink their strategies in the region, according to a new report from Arab Petroleum Investments Corporation (APICORP) entitled *IOCs heading in different directions in MENA*.

Falling oil prices and capital discipline have impacted overall investment, with IOCs increasingly focusing on low cost barrels. Total, which has focused on reducing its cost structure and securing deals, is pushing to become the dominant IOC player in the region in the pursuit of low cost barrels, being the first to sign up for the ADCO concession renewal in 2014, replacing Maersk in the Al-Shaheen field in Qatar and looking to play a significant role in Iran.

BP has focused on recovering from the Deepwater Horizon oil spill but is now beginning to invest again, reinforcing its commitment to the UAE with the acquisition of a 10 per cent stake in the ADCO concession, and investing heavily in Oman. Shell's recent takeover of BG makes its Middle East position less clear; while it is expressing strong interest in Iran, recently signing a MoU for exploratory studies, it is looking to depart Iraq's oil sector.

Some IOCs no longer see the Middle East as their preferred destination, the emergence of US shale being a key factor. Both ExxonMobil and

Chevron are reducing their roles in the region and focusing more on their US operations, seeing more value and quicker returns.

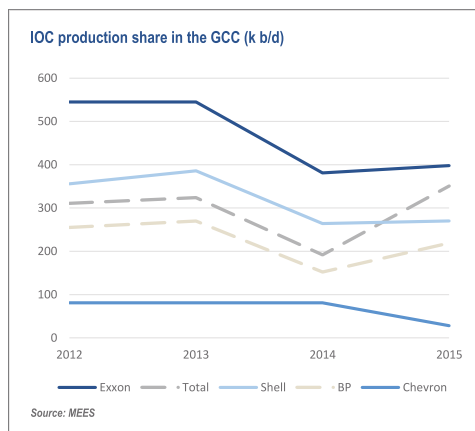
IOCs are still wary of entering Iran over fears of violating regulations and risking heavy fines, and are seeking clarity over the US administration's Iran policy before committing.

The unattractive fiscal terms on offer in some countries have caused some IOCs to reconsider their position in key producing countries. Some of the largest reserves in Saudi Arabia and Kuwait are not open to foreign players, and IOCs like Shell, ExxonMobil and Total have had their involvement limited to technical service agreements, technical studies and R&D. IOCs in Iraq are usually offered low margins, and essentially operate as contractors, while in the case of Iran it remains unclear how attractive the new terms offered under the IPC are.

The report argues that Asia, which remains the Middle East's top export destination, will likely fill the void left by some of the western majors.

Companies like CNPC are putting the Middle East – particularly Iran and Iraq – at the forefront of their global upstream strategy. Middle Eastern governments will also be keen to build stronger ties with Asian countries, the main source of demand growth for their oil.

The full report can be accessed at www.apicorp-arabia.com/Research.



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النفط البحرية، ومن ثم سلامتها». وتصرّح بأن هناك توجهات واضحة مستجدة على الساحة. فأفضل الشركات - حسب قولها - تعيد النظر في كيفية تعزيز ثقافتها الإيجابية المتعلقة بالسلامة. وقد نتج عن ذلك ظهور طرق مبتكرة في توفير التدريب. «يتم التأكيد على التوقف عن الاعتماد على استغلال «سياسة السلامة» التي تتبناها الشركة لصالح أدوات مشاركة الموظفين مثل الحوافز، مما يدعم العمال خلال هذه العملية».

غير أن التدريب عالي الجودة يعد استثماراً فعالاً، وقد كان لانخفاض سعر النفط الخام تأثيراً على الأرباح بجميع الشركات. ويعتقد جيبينز أن هذا هو «تحدي خطير» يواجه الصناعة في الشرق الأوسط وإفريقيا. «لقد أرغمت الشركات على تقليص الميزانية، وقد أثر ذلك على مستويات التوظيف والاستثمار والإنفاق الاختياري على أمور مثل التدريب».

ويلاحظ جيبينز أيضاً توجه آخر مثيراً للقلق في الشرق الأوسط وإفريقيا. «في كلا المنطقتين، تسعى الشركات لخفض أعداد الموظفين الوافدين ذوي الخبرات العريضة. مما يعني أن كمّاً هائلاً من المعلومات يغادر الشركات. ويتزامن ذلك مع تقليل التدريب». وهو يبدي قلقه حيال وجود مخاطر فعلية متعلقة بتدهور المعايير. «نشهد بالفعل وقائع متزايدة تسببها ظروف قاهرة مرتبطة بأمور السلامة، حسبما تذكر الشركات، مما يشير إلى فقدان القدرة على تلبية متطلبات العملاء على نحو غير متوقع». وتؤكد واتكينز نفس هذه الشواغل. فيقول: «يرى البعض أن تدريب الموظفين في بعض الأحوال «أموالٌ مهدرة». ولكننا نذكره بمقولة: إذا كنت تظن أن التدريب باهظ التكلفة، فجرب حادثاً حقيقياً».

سكاندينافيا إيه إس، ميرسك أويل أند غاز إيه إس وستاتويل إيه إس، إلى جانب شركة جنرال إلكتريك للنفط والغاز.

غير أنه ليس فقط إبداع التصميم والبنية الأساسية الذي يمكن تحسينه. وتثق الخبرة في معايير السلامة الحديثة، إن جي، في أن أصول البنية الأساسية قد أصبحت الآن أكثر أماناً بوجه عام من ناحية التصميم، وترى أنه من المؤكد على نطاق واسع رجوع «٨٠-٩٠ في المائة على الأقل من الحوادث الكبرى» إلى عوامل بشرية. وتقول إن تدريب وإدارة الكوادر البشرية العاملة في منشآت حقول النفط البحرية لا تقل أهمية عن استخدام أنظمة البنية الأساسية والإدارة الصحيحة. «إن ثقافة السلامة الإيجابية أمر في غاية الأهمية، لا سيما في بيئات العمل التي يقضي موظفوها نوبات طويلة وكثيرة المتطلبات في ظروف صعبة تزداد خلالها احتمالات تعرضهم للتعب والإرهاق».

أما واتكينز، مسؤول مكافحة الحرائق البريطاني الأسبق والذي يحظى بخبرة تزيد عن ٢٠ عاماً، فيعتقد أن الحوادث الكبرى على مستوى العالم، مثل ديب ووتر هورايزن، قد جعلت الشركات تعيد التفكير في تدريب طواقمها. ويقول إنه في السابق كان يتم تركيب أنظمة إخماد الحرائق فقط لتلبية المتطلبات التنظيمية. لكن الآن هناك اهتمام أكبر بتوفير التدريب الجيد للتعامل مع المواقف الحقيقية. «من بين الأمثلة الجيدة توفير إدارة حالات الطوارئ الكبرى (MOME) التدريب لمديري منشآت حقول النفط البحرية العاملين في هذه المنشآت».

وتقول إن جي: إن فهم «العامل البشري» أمرٌ مهمٌ وتعتقد «أننا فقط نبدأ في إدراك مدى تأثير قوى العمل على كفاءة تشغيل الأصول في حقول

أننا نشهد في الفترة المقبلة إقامة المزيد من منشآت معالجة النفط والغاز المصحوبة بمخاطر كبيرة لانبعاث الغاز المجهزة بـ «أنظمة إطفاء الحريق التلقائية كلياً».

كما يعتقد آندي جيبينز، مؤسس ورئيس مجلس إدارة شركة GLAS ومقرها الإمارات، والتي توفر استشارات عالية المستوى لقطاعات النفط والغاز والبتروكيماويات، أن الهدف الرئيسي هو منع «خسارة الاحتواء». «ويعني ذلك منع إطلاق السوائل والغازات القابلة للاشتعال من الأنابيب والأجهزة». ويقول إن ذلك يتأتى بجودة التصميم والمعايير التشغيلية. وترى نيكي إن جي، المستشارة الأولى في لويذر ريجستر (LR)، المؤسسة العالمية للخدمات الهندسية والفنية وخدمات الأعمال والتي تقدم الخدمات الاستشارية، أن أفضل ممارسة على الإطلاق تبدأ بالنهج الصحيح منذ البداية.

وتقول: «إن أفضل وقت لتطبيق مبادئ السلامة الأساسية يكون خلال مراحل التصميم الأولى».

وهي تبرهن على أن الشركات بحاجة إلى الرجوع خطوة للخلف وتصور منصات حقول النفط البحرية كما هي عليه في واقع الحال: «مدن عائمة تنتج مواداً كيميائية شديدة الخطورة على مدى ٢٤ ساعة يومياً».

ولهذا السبب أطلقت لويذر ريجستر مشروعاً صناعياً مشتركاً للبحث في كيفية تقليل مخاطر الانفجار والحريق المحتملة والناجمة عن تسرب منتجات الهيدروكربون في توربينات الغاز بأفضل صورة ممكنة. «تتعاون الشركات والجامعات في عموم أرجاء العالم لإطلاق هذه المبادرة الجديدة لتحسين التوعية بكيفية تحسين التصميم التي توفر السلامة». ومن بين المشاركين في هذا المشروع: كونوكو فيليبس

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الإدارة الفعالة للسلامة من الحرائق

في هذا المقال، تناقش أمانيا إيلجنر التدابير والممارسات التي من شأنها تقليل مخاطر اندلاع الحرائق في قطاع النفط والغاز.

«فالك فاير أكاديمي»، الشركة الرائدة عالميا في توفير خدمات السلامة والدورات التدريبية الخاصة بالسلامة في مكان العمل، مع التركيز على قطاعي الملاحة وحقول النفط البحرية: «سيتم التحكم في السلامة من الحرائق بشكل متزايد بواسطة الكشف الرقمي والذي عن الحرائق والغازات والدخان». وقد توقع واتكينز أيضا

عدد وقيمة المطالبات. إذن ما هي التدابير التي يتخذها الخبراء البارزون في مجال السلامة من الحرائق لتقليل المخاطر والخسائر المرتبطة بالحريق، وما هي أحدث النتائج التي تم التوصل إليها بخصوص أفضل الممارسات والحلول الإبداعية؟ يقول ستيف واتكينز، أحد كبار مستشاري

بناء على ما يقرب من ثلثي مطالبات التعويض التأمينية، تعتبر الحرائق والانفجارات السبب الرئيسي في «انقطاع الأعمال»، وذلك وفقا لما ورد في آخر تقرير صادر عن شركة التأمين العملاقة «أليانز». ولا عجب أن ينطبق الأمر ذاته على قطاع الطاقة حيث تمثل «الحرائق والانفجارات» السبب الأول للخسائر، حسب

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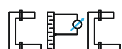


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Sour field development plans are ongoing throughout the Middle East, given the gas demand and none more so than in the UAE where priorities in ADNOC's integrated gas master plan include tapping into deep and sour gas reserves and deploying innovative CCUS for EOR. SOGAT 2017 has been designed to reflect these interests with the Advisory Committee specifically selecting workshops and papers in the conference programme as shown below. Moreover special arrangements have been made with ADNOC for a group of 100 senior technical managers to participate in SOGAT thus ensuring highly active networking and interactive discussion for the benefit of all parties involved in these ongoing plans.

SOGAT Workshops

March 26-27

SOGAT Workshops will be highly practical in nature and allow for interactive discussion to address delegates' concerns and issues and will focus on: Sour Gas Process Optimisation and Simulation; Improving SRU Cost Efficiencies and Associated KPI's; CCUS in Reality – Regional Application, Technology, HSE, Economics and Policy; Novel Methodologies in Mercaptan Removal, and are separately bookable.

13th International SOGAT Conference

March 28-30

The Conference Programme will feature such technical topics as:

- Energy recovery in CO2 removal processes
- Case study of SRU and AGE facilities installed in a newly discovered gas field in Egypt
- Successful implementation of flare gas recovery systems
- Performance improvements in AGR from ultra sour wells
- Dealing with CO2 cycling due to CO2-EOR
- Operational process safety experiences at the Shah field
- Recovery processes for small to medium remote sulphur load fields
- Specialised solvent to improve H2S removal performance
- Energy performance benchmarking of gas sweetening units
- New developments in analyzers for continuous monitoring of H2S in gas streams
- New developments in tube sheet linings
- Novel approaches to sour well testing
- Digital platforms to improve SRU reliability, performance and reduce operating costs

Please visit www.sogat.org to view the full programme of which 80% plus of the presentations are case studies from operators' experiences.

SOGAT Exhibition

March 28-30

Exhibitors include Energy Recovery, Huntsman, OHL Gutermuth Industrial Valves GmbH, Al Hosn Gas, DOW, Worley Parsons, John Zink Hamworthy and many more. Please visit www.sogat.org/exhibition to review the shell scheme, floor plan and availability.

*For further information on all aspects of SOGAT 2017 and to reserve your delegate places please refer to www.sogat.org or contact **Nerie Mojica** at:
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بانخفاض أسعار النفط، تبرز الحاجة إلى وجود استجابات إستراتيجية من شأنها التركيز على تكامل سلسلة القيمة، بما يضمن انضباط رأس المال ورفع الكفاءة التشغيلية».

مستوى العالم، والتزامها بتحقيق التنمية الخضراء والمستدامة، مع تأمين متطلباتها من الطاقة». ومن جانبه، أضاف سيف حميد الفلاسي، المدير العام لمجموعة إينوك، قائلا: «إن زيادة الطلب، المقترنة

دولة الإمارات، يكون من المتوقع أيضا زيادة الحاجة للطاقة تدريجيا. ومن ثم يتعين على شركات النفط الوطنية التركيز على ضخ الاستثمارات في المشاريع التي تعزز ريادة دولة الإمارات في مجال الطاقة على



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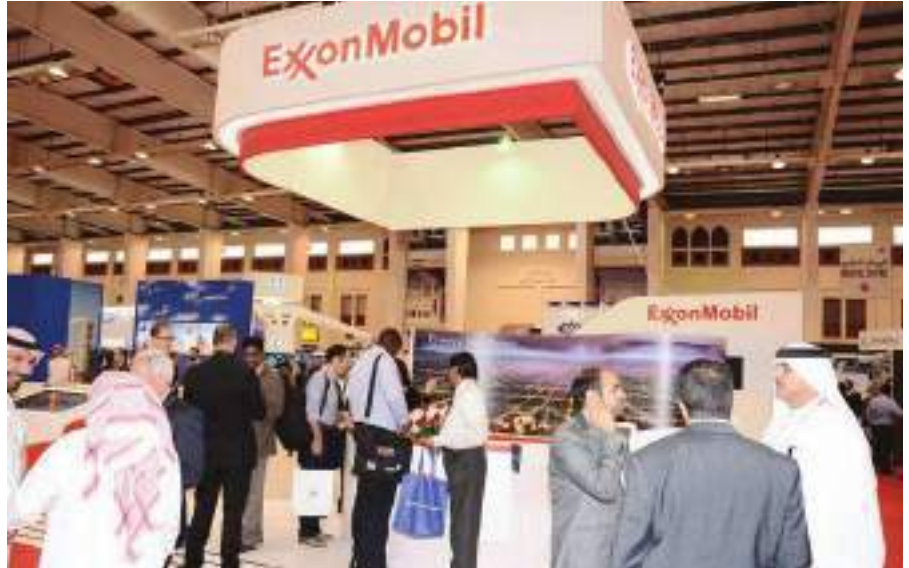
٦ - ٩ معرض الشرق الأوسط للنفط والغاز - ميوس ٢٠١٧ المنامة
٢٦ - ٣٠ معرض التقنية المتقدمة للنفط الحامض والغاز - سوجات ٢٠١٧ أبو ظبي

أبريل/نيسان

١١ - ١٢ مؤتمر الشرق الأوسط للنفط الثقيل المنامة
٢٦ - ٢٧ معرض ومؤتمر الشرق الأوسط وأفريقيا لتخزين السوائل - StocExpo 2017 دبي

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من المزمع إقامة فعاليات معرض ومؤتمر الشرق الأوسط للنفط والغاز العشرين (ميوس ٢٠١٧) في الفترة بين ٦ - ٩ مارس/آذار ٢٠١٧ بمركز البحرين الدولي للمعارض والمؤتمرات، ومن المتوقع أن يحضره أكثر من ٨ آلاف مهني متخصص في مجال النفط والغاز. علما بأن هذا المعرض، الذي مازال يحتفظ بمكانته كمنصة رئيسية لمشاركة المعلومات والخبرات المتعلقة بالتنقيب والإنتاج في المنطقة، تتولى تنظيمه كل من جمعية مهندسي البترول (SPE) وإدارة المعارض العربية (AEM) وقال نبيل العفالق، الرئيس المشارك في مؤتمر «ميوس ٢٠١٧» وكبير مهندسي البترول في أرامكو السعودية: «إن عام ٢٠١٧ يشهد إقامة النسخة العشرين من معرض ومؤتمر الشرق الأوسط للنفط والغاز والذي حظي، على مدى ٣٨ عاما، بالنجاح والتواصل الفعال بين رواد هذه الصناعة وخبرائها التقنيين في قلب المنطقة المتربعة على عرش توريد الطاقة في العالم». وتابع قوله: «يقام معرض ومؤتمر الشرق الأوسط للنفط والغاز هذا العام تحت شعار (تحويل الصناعة عبر الإبداع والتميز التشغيلي). فقد جعلت التغيرات التي تتعرض لها أسواق النفط والغاز هذه الصناعة مليئة بالتحديات. ومن ثم يكتسب التركيز على الإبداع وممارسة التميز التشغيلي أهمية غير مسبوقة. وسوف يتيح هذا التحول للصناعة مواصلة الوفاء بمتطلبات الطاقة العالمية في المستقبل، مما يضمن استمرارية النمو الاقتصادي على الرغم من الطبيعة الدورية للأعمال». ومن المقرر أن تتناول الجلسات التقنية بالمؤتمر موضوعات حول إنتاج المستودعات والمنشآت، والاستكشاف والتقييم، والحفر والأعمال المنجزة، وإدارة المشاريع، والموارد البشرية، ونماذج الأعمال، والصحة والسلامة والحماية والبيئة. كما يشمل الحدث أيضا دورتين تدريبيتين تستغرق كل منهما يوما واحدا بعنوان «تصميم ومعالجة التكسير الهيدروليكي المتطور» و«حلول الرفع الصناعي وتحسين الإنتاج». هذا إلى جانب برنامج كامل من الأحداث التي تستهدف الجيل التالي من المتخصصين في مجال النفط والغاز. يجدر بالذكر أن المعرض يضم ما يزيد على ٢٠٠ جهة عارضة من ٣٠ دولة، ويشمل كافة المجالات في قطاع النفط والغاز.



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إعادة الهيكلة من أجل التنمية المستدامة بعيدة المدى



شركات النفط والغاز تلجأ إلى تنوع استثماراتها في قطاعات أخرى مثل الطاقة المتجددة

على المدى الطويل. ويتوقع ٢٦ في المائة من رواد هذه الصناعة أن تجري شركاتهم استثمارات في الطاقة المتجددة خلال ٢٠١٧، ويعتبر غالبيتهم الاستثمارات في الطاقة المتجددة تحولاً لإستراتيجية الشركة طويلة المدى. كذلك يتوقع كبار المهنيين في قطاع النفط والغاز الاستمرار في ضخ الاستثمارات عبر سلسلة القيمة خلال ٢٠١٧، ولكن بمستوى أقل من العام الماضي، حيث انخفضت نسبة المحييين الذين يتوقعون الاحتفاظ بنفقات رأس المال أو زيادتها من ٤٣ في المائة إلى ٣٩ في المائة. وأجاب ثلث المشاركين بأن مؤسساتهم ستعمل على زيادة نشاط الاندماج والاستحواذ خلال الشهور الاثني عشر المقبلة، بينما توقع أكثر من ثلثي المشاركين زيادة التركيز في هذه الصناعة. ويرى ٨٥ في المائة من المشاركين في الاستقصاء أن إدارة التكاليف هي أولى الأولويات أو تأتي ضمن أهمها في ٢٠١٧، بينما يعتبر الغالبية أن التدابير التي تتخذها شركاتهم لتوفير التكاليف في الوقت الحالي تُحدث نقلة دائمة باتجاه أسلوب عمل أكثر كفاءة. وتعتبر إعادة الهيكلة المؤسسية، وتقليل نفقات التشغيل، وتحسين الكفاءة للأصول الحالية، الأولويات الثلاث الأولى للتحكم في التكاليف. يقول ثلثا المشاركين إن الضغوط الخاصة بالتكاليف تدفع نحو المزيد من التعاون الصناعي، ويعتقد ٦٦ في المائة منهم أن شركاتهم ستسعى لتوحيد المعايير الخاصة بالأدوات والعمليات بصورة أكبر، لترتفع عن نسبة ٥٩ في المائة في العام الماضي. ويبرز التحول الرقمي أيضاً بشكل أخذ في التزايد كوسيلة لتعزيز الكفاءة التشغيلية وكفاءة التكاليف.

لصناعة النفط والغاز، واستقصاء لكبار المهنيين المتخصصين في هذا المجال على مستوى العالم. وخلال فترة تعاف ممتدة، يتوقع ٤٩ في المائة من كبار المهنيين في مجال النفط والغاز والذين شملهم الاستقصاء، أن تتجه شركاتهم لتنوع استثماراتها أو ضخ المزيد من الاستثمارات في فرص أخرى خارج قطاع النفط والغاز. غير أنه لا يزال ثمانية من كل عشرة يتوقعون المزيد من الفرص للغاز

أظهر بحث جديد أجرته شركة ديت نورسك فيريتاس، التي تقدم الاستشارات الفنية في مجال النفط والغاز، سعي شركات النفط والغاز لإعادة توازن حقائبها الاستثمارية وإعادة تنظيم هيكلها استعداده لحقبة جديدة. هذه الدراسة السنوية السابعة لشركة ديت نورسك فيريتاس، والتي بعنوان «سهولة التغيير قصيرة المدى، والمرونة بعيدة المدى»، تعرض نظرة مستقبلية

بتروال الإمارات الوطنية تسجل رقماً قياسياً جديداً في حجم المبيعات



أعلنت شركة بترول الإمارات الوطنية (إينوك) عن تسجيل رقم جديد لحجم مبيعاتها من المنتجات البترولية في ٢٠١٦ بلغ ٢٤٥ مليون برميل، ليكون متوسط النمو المتحرك عبر خمس سنوات هو تسعة في المائة. ومن المرتقب أن تركز إينوك جهودها واستثماراتها، في إطار إستراتيجية السنوات الخمس، على تلبية متطلبات دبي من الطاقة عبر توسعة شبكة محطات الخدمة ومعامل التكرير الخاصة بها، وتطوير القدرات التخزينية للمحطات وزيادة حصتها السوقية في التسويق للديزل ووقود الطائرات والغاز البترولي المسال. ويشمل ذلك إخضاع محطات الخدمات الكبرى للتجديدات المستمرة في دبي، وإنشاء ٥٤ محطة جديدة بحلول ٢٠٢٠.

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