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Oil Review Middle East

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Middle East oil companies expand global petrochemicals footprint

- Redefining resilience in the oil and gas industry
- Challenges and opportunities in Kuwait
- The latest in valve technology
- Is AI the key to growth for energy companies?
- Geochemistry moves to the wellsite
- Automating seismic data acquisition

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Oil Review Middle East
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Editor's note

HOW CAN OIL and gas companies remain resilient in the coming years? This was the question addressed at the opening plenary session of MEOS 2019, which took place in Bahrain in March and provided a forum to discuss the critical issues facing the industry (p11). Reducing carbon footprint, embracing the possibilities of the Fourth Industrial Revolution, countering negative perceptions of the industry, working more collaboratively and improving engagement with all stakeholders were among the themes emerging.

With oil demand for transportation fuel set to plateau, the future for hydrocarbons lies not in gasoline and diesel, but in chemicals – and Middle East oil and gas players have plans to bring on massive amounts of capacity (see p20). We also look at the latest developments in Kuwait's oil and gas industry (p16), while our technology section features topics ranging from artificial intelligence to H2S mapping and autonomous offshore operations.

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➔ Executives' Calendar 2019

APRIL			
28-2 May	**SOGAT**	ABU DHABI	www.sogat.org
28-29	**Int'l Offshore Development Congress**	ABU DHABI	www.iodcongress.com
MAY			
1-4	**Iran Oil Show**	TEHRAN	www.iran-oilshow.ir/en
6-9	**OTC**	HOUSTON	http://2019.otcnet.org
JUNE			
17-18	**Bahrain Health, Safety & Environment Forum**	MANAMA	www.hse-forum.com
25-26	**East Med Gas 2019**	LONDON	www.newsbaseeastmed.com
27-28	**Iraq Petroleum**	LONDON	www.cwciraqpetroleum.com
SEPTEMBER			
2-4	**World Heavy Oil Congress**	MUSCAT	www.worldheavyoilcongress.com
3-4	**Kuwait Health, Safety & Environment Forum**	KUWAIT	www.hse-forum.com
3-6	**Offshore Europe**	ABERDEEN	www.offshore-europe.co.uk
9-12	**World Energy Congress**	ABU DHABI	www.wec24.org
24-25	**Oman Health, Safety & Environment Forum**	MUSCAT	www.hse-forum.com
OCTOBER			
13-16	**Kuwait Oil & Gas Show (KOGS)**	KUWAIT	www.kogs-expo.com
NOVEMBER			
9-12	**ADIPEC**	ABU DHABI	www.adipec.com

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

OTC 2019 to showcase the latest in offshore technologies

THE OFFSHORE TECHNOLOGY Conference (OTC 2019) which celebrates its 50th anniversary this year, takes place from 6-9 May at the NRG Park, Houston, Texas. It will feature more than 2,000 exhibiting companies from 40 countries with 23 international pavilions, and is expected to attract more than 60,000 industry professionals from more than 100 countries.

OTC is a leading global event for the development of offshore resources, showcasing leading-edge technology for offshore drilling, exploration, production, and environmental protection. It brings together industry leaders, investors, buyers, and entrepreneurs to develop markets and business partnerships. Its large international participation provides excellent opportunities for global sharing of technology, expertise, products, and best practices.

The OTC conference features more than 350 technical presentations, 22 topical breakfast and luncheons, and 11 panel sessions. This year's event will see an increased focus on renewable energy, with a panel session on wind energy and technical sessions on wind, hydrokinetic and gas hydrate advancements.

A highlight of the event will be the opening general session 6 May, under the theme "OTC's Golden Anniversary Opening Session: The Next 50 Years of Offshore Developments." Global energy leaders will explore how companies are preparing for the brave new world of digitalisation, automation, and machine learning, sharing their vision for the future of offshore E&P operations.

OTC will feature a new programme called the "Around the World Series", where global industry leaders from countries including Australia, Norway, Mexico, France, UK, Israel, Canada, Ghana and Guyana will discuss new licensing and business opportunities, as well as recently introduced technologies.

OTC is a leading global event for the development of offshore resources.

Image Credit : pichitstocker/Fotolia

Returning features include the Spotlight on New Technology Award which showcases the latest and most advanced technologies that are leading the industry into the future; and the Spotlight on Small Business Award, which rewards companies with fewer than 300 employees. While the University R&D Showcase will provide a forum for universities to discuss their research and development projects.

For further information see the website at http://2019.otcnet.org.

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WE KNOW WHAT'S AT STAKE.

Saudi Aramco's ambitious expansion plans boosted by share offering

SAUDI ARAMCO HAS priced an offering of US$12bn in its inaugural international bond issuance. The issuance comprises five tranches of senior unsecured notes under Saudi Aramco's Global Medium Term Note Program and is expected to close on 16 April 2019. The Notes will trade on the London Stock Exchange.

The issue was heavily oversubscribed, received a record-breaking US$100bn in orders. This exceeds the US$67bn demand for Saudi Arabia's 2016 government bond market debut and signals strong international investor confidence, with some interpreting it as a gauge of potential investor interest in the oil giant's postponed initial public offering, now scheduled to take place in 2021.

While credit rating agencies rate Saudi Aramco in line with the Saudi government in the single A bracket, its huge profits would have earned it the highest AAA rating if it were a standalone company, on par with IOCs such as Shell and Exxon Mobil. Saudi Aramco in advance of the bond sale revealed its accounts for the first time, showing that it is the most profitable company in the world. It recorded net profits of US$111.1bn and core earnings of US$224bn in 2018, with US$86bn in free cash flow at the end of the year.

The bond issue follows hard on the heels of Aramco's planned US$69.1bn acquisition of a 70 per cent stake in petrochemicals firm Saudi Basic Industries Corp (SABIC) from the kingdom's sovereign wealth fund, which will almost double Aramco's refining capacity to 8-10mn bpd by 2030, according to the official announcement, and is expected to help the company to expand aggressively in the downstream sector, both at home and abroad.

Amin Nasser, Saudi Aramco's president and CEO commented that the SABIC acquisition is a "major step in accelerating Saudi Aramco's transformative downstream growth strategy of integrated refining and petrochemicals," while Abdulaziz Al-Judaimi, senior vice-president of downstream at Saudi Aramco said, "We are pursuing partnerships and acquisitions where we create long-term value and developing groundbreaking crude-oil-to-chemicals technologies. SABIC is a good strategic fit and a solid platform to support our continued investment for future growth in petrochemicals – the fastest growing sector of oil demand."

Saudi Aramco is pursuing massive expansion plans.

Image Credit : Saudi Aramco

While some investors have linked the bond issue to the SABIC acquisition, Anna Belova, senior oil and gas analyst at GlobalData commented,

"As the world's most profitable company, it can be argued that Aramco does not need to resort to debt offering and that the bond serves a secondary purpose to inspire confidence and offer new transparency into Aramco's finances, as the company fires up its global expansion strategy.

"Beyond the stated goal of acquiring SABIC, Aramco is pursuing multiple gas, midstream and downstream opportunities worldwide."

At the IP Week conference in London in February, Nasser announced that Saudi Aramco would continue to make major investments offshore Marjan and Berri fields to maintain maximum sustainable capacity, and its intentions of becoming "a global leader when it comes to gas." The company plans to become a gas exporter in the course of the next decade, with gas accounting for 70 per cent of electricity generation by 2030 as compared with 55 per cent now, and is looking to invest globally in gas, he said.

"Chemicals is a major area for Saudi Aramco, now we're looking at 30 to 40 per cent integration," he added, saying that the company is looking to be "world number one in chemicals" with plans to shift 7mn bbl of crude to chemicals over the next two to three decades. "This adds value for us when we go down the value chain, at the same time increasing our profitability and diversification," he commented.

Saipem wins US$200mn offshore drilling contracts


Image Credit: Richard Child/Flickr

The rig is expected to be under operation by Q2 2020.

ITALIAN OFFSHORE CONTRACTOR Saipem has been awarded new offshore drilling contracts worth US$200mn in Norway and the Middle East.

One contract was signed with the German company Wintershall for the drilling of two wells plus two optional ones in continuity with previous engagements for operations offshore Norway.

The contract will be executed by the sixth-generation semi-submersible rig Scarabeo eight, a drilling unit designed for harsh environments.The rig is expected to be under operation by Q2 2020.

In the Middle East, Saipem's contract involves a four-year extension of the use of the high specs Jack up Perro Negro 7.

Perro Negro 7 is a self-elevating drilling unit capable of operating in water depths of up to 375 feet.

The work commenced at the end of the Q1 2019. With these, Saipem aims to strengthen its presence in a major area of shallow water operations in the oil and gas industry.

Oil prices post best quarterly performance in 10 years: NBK Research

OIL PRICES FOR the Q1 2019 have posted their best quarterly performance since 2009, according to research by National Bank of Kuwait (NBK).

A tightening market

Improving oil prices have been driven by a tightening market, with production cuts across a number of global producers. OPEC's efforts to set production limits, in addition to commitments to the Vienna Agreement, have resulted in significant reductions in output by leading oil producers.

OPEC-11 compliance reached 106 per cent in February, with aggregate production falling by 812,000 bpd. Non-OPEC compliance improved to 52 per cent in February, from 25 per cent in January of this year. Russia recently reiterated that it intends to fully comply soon.

Political turmoil has resulted in a supply adjustment, with output from Venezuela, Libya and Iran falling. Even in the USA, supply has been less bullish. While the USA crude production continues to break new ground, the number of oil drilling rigs has fallen for six consecutive weeks, by 7.8 per cent in 2019.

Dr Saade Chami, chief economist at NBK, commented, "The possible non-renewal of the 180-day USA sanctions waivers on Iran expiring in early May will have a significant impact on oil markets, with a potential reduction in supply of several thousand barrels. However, experience taught us that oil prices are subject to large swings as we have witnessed recently."

"Of course, the oil price outlook rests on several moving parts, both economic and political, and not all of which will necessarily come into play to the extent envisaged – or at all – during the remainder of the year. Policy changes, global geopolitical conditions and market dynamics will continue to affect a rapidly shifting price environment," Chami added.

Downside risks to oil prices could include the USA shale-led supply gains, termination of the OPEC+ supply agreement in June or under-compliance by a few members and a further weakening of global economic growth.

Oil prices soared in early April, with Brent rising to its highest point since early November.


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Lebanon confirms second offshore licensing round

THE LEBANESE GOVERNMENT has approved the opening of the country's eagerly anticipated second offshore licensing round. Interested companies will be expected to submit their bids by 31 January 2020.

The Lebanese Petroleum Administration (LPA) detailed a total of five offshore blocks to be offered in the second round – blocks one, two, five, eight and 10.

They indicated that tenders will not be preceded by a separate pre-qualification process, as was the case in the first round, in order to streamline the process and allow oil companies additional time for evaluation. Provisional block winners are expected to be announced during April 2020.

The legal framework for the second round has largely remained unchanged from the first, but pre-qualification criteria have been slightly relaxed to encourage greater participation.

Following the massive Zohr discovery offshore Egypt, which opened up a different play type to those of the Leviathan and Aphrodite discoveries, there has been a renewed focus on exploration activity in the eastern Mediterranean. ExxonMobil with Qatar Petroleum announced a multi-TCF discovery of gas in the Glaucus-1 well offshore Cyprus in February. Based on preliminary interpretation of the well data, the discovery could represent an in-place natural gas resource of approximately five trillion to eight trillion cubic feet (142bn to 227bn cubic metres), according to the company.

'Global oil and gas discoveries on the rise'

OIL AND GAS exploration is off to a flying start in 2019, with majors taking a bigger role of the conventional resources discovered in the first quarter, according to Rystad Energy.

Image Credit: drpepperscott230/Pixabay

Global discoveries of conventional resources in the first quarter reached a robust 3.2bn bbl of oil equivalent.

Global discoveries of conventional resources in the first quarter reached a robust 3.2bn bbl of oil equivalent. Most of the gains were recorded in February, posting 2.2bn bbl of discovered resources.

"If the rest of 2019 continues at a similar pace, this year will be on track to exceed last year's discovered resources by 30 per cent," said Taiyab Zain Shariff, upstream analyst at Rystad Energy.

Majors are leading the charge in exploration, reporting more than 2.4bn bbl of oil equivalent of discovered resources. The six largest discoveries by the majors each exceed 150mn bbl of oil equivalent, and the top three could even hold more than 300mn bbl of oil equivalent apiece.

ExxonMobil was the most successful, with three significant offshore discoveries accounting for a whopping 38 per cent of total discovered volumes. European majors Total and Eni are also in the fold with successful offshore wells in South Africa, the UK, Angola and Egypt.

Total to explore for Oman gas

TOTAL AND THE Ministry of Oil and Gas of the Sultanate of Oman have signed a Heads of Agreement (HoA) for the award to Total of an exploration license on Block 12 with significant prospective gas resources.

Image Credit : Total

Block 12 is located onshore, in the northern part of Block 6 and to the south of the Greater Barik area.

Under the terms of this HoA, Total will have 100 per cent working interest and operatorship of the exploration Block 12, located in Central Oman.

The new agreement was signed after Total, the Ministry of Oil and Gas and Oman Oil Company (OOC) reached a new milestone to implement their integrated gas project, which entails developing the gas resources of the Greater Barik area (Blocks 10 and 11), as well as building and operating a liquefaction plant to offer a bunkering service and supply LNG as a fuel to marine vessels.

Total's exploration programme on the block will comprise seismic acquisition and drilling, with the drilling of a first well in 2020.

Redefining resilience for the coming years

At the opening executive plenary session at MEOS 2019 entitled 'Resilience of the Future – How Can We Achieve Resilience in the Coming Years?' presidents and CEOs from Saudi Aramco, Schlumberger, BHGE and Eni shared their recipes for resilience from both operator and service company perspectives.

Image Credit : Adobe Stock

The industry has a unique opportunity to be at the epicentre of the Fourth Industrial Revolution.

IN RECENT YEARS, oil companies have focused their efforts on cost-cutting and operational efficiencies to remain competitive in the lower oil price environment. But the game is changing, and to remain resilient in the future, oil companies need to consider approaches such as embracing digitalisation, working more collaboratively, addressing negative perceptions of the industry, reducing carbon footprint and better engaging with all stakeholders and communities.

Mohammed Y. Al-Qahtani, Saudi Aramco's senior vice president of Upstream, said that taking into account "the evolving nature of what resilience means to our industry" is important to redefining the future.

He reflected on how the successful oil and gas company of the future should be "smarter" both in terms of technology and emotional intelligence.

"The enablers of resilience – profitability, adaptability and sustainability – are being redefined. Much like the energy landscape itself. Engineering, earth sciences, managing mega-projects – this is in our wheelhouse, our IQ if you will, but we must also strengthen our emotional intelligence to understand and meet society's expectations."

Unique opportunity

Al-Qahtani said the oil and gas industry has "a unique and historic opportunity" to be at the epicentre of the Fourth Industrial Revolution.

"As an industry, we have massive amounts of data from seismic, production, mechanical, and electrical functions. A single drilling rig or gas plant can generate terabytes of data every day," he said. "By applying new technologies to data we are already gathering, we can change the game."

In exploration, machine learning and artificial intelligence can sift through vast amounts of 3-D and 4-D seismic data to extract features invisible to the human eye. In drilling, said Al-Qahtani, the industry should settle for nothing less than fully automated drilling rigs to enhance performance, safety, and efficiency.

"As an industry, we must reclaim our passion for innovation, because there are technologies within our reach that are turning science fiction into science fact."

> "We must also strengthen our emotional intelligence to understand and meet society's expectations."

He cited as an example Saudi Aramco's Uthmaniya gas plant, which has become a leader in advanced analytics and artificial intelligence solutions which have helped to reduce inspection times by 90 per cent, reduce costs and improve safety.

He also suggested that "collaboration, not isolation" is key to making innovation work on a grand scale.

"Whether it's a full-scale test deployment with a leading robotics company, or a simple collaboration with a university on a difficult algorithm, we must transform our industry by working together," he said.

Turning to emotional intelligence, Al-Qahtani said successful energy companies of the future must be seen as contributing to human advancement – whether that be consumers and employees, supplies, governments, regulators or communities.

Paying attention to climate change and delivering technologies that reduce the greenhouse gas footprint of hydrocarbons, such as carbon capture and reducing flaring, is a must, said Al-Qahtani, and the industry should better communicate the actions it is taking and the progress that is being made.

"We need to help our stakeholders realise that we are part of the solution," he said. "We can be confident that oil and gas will continue to play a vital role for the foreseeable future. But to sustain this industry we must increase our value proposition for society, particularly as alternatives become more affordable," he said.

Image Credit : UBM AEM

Left to right: Eithne Treanor, moderator; Mohammed Y. Al-Qahtani, Saudi Aramco; Paul Kibsgaard, Schlumberger; Lorenzo Simonelli, BHGE; Fuad Krekshi, Eni.

> "By communicating clearly about this we will continue to make our industry attractive"

Strong pipeline of top talent

Schlumberger chairman and CEO Paal Kibsgaard gave an oilfield services company perspective, saying, "The starting point for any discussion of resilience is to make sure we have a strong pipeline of top talent to become our innovators and our leaders.

"As an industry we have a huge responsibility for ensuring sufficient supply to feed the growing demand. At the same time we are acting responsibility by having a constant focus on the environmental impact of our activities and developing technologies that minimise our carbon footprint. We do a lot of amazing things from a technology and innovation standpoint. By communicating clearly about all of this we will continue to make our industry attractive to freshout graduates.

"We need to ensure investments in new capacity and technology and innovation to develop increasingly complex hydrocarbon resources," he went on. "A large part of oilfield services innovation in the E&P space is taking place in the supplier industry. We see a significant performance upside in shifting the emphasis away from individual technologies towards complete technology systems, leveraging the latest advances in systems design, hardware, software and digital technologies."

Kigsgaard stressed however that the focus from operators over the past four years on beating down pricing of oilfield products and services has put the supplier industry under financial pressure. "Effective pricing needs to increase to restore a more balanced distribution of cash flow and profits.throughout the E&P value chain, and create the financial basis for the supplier industry to make the needed investment in new capacity and technology innovation."

Highlighting the importance of collaboration, he commented, "A more team-based approach between operators and the supplier industry, where all parties are encouraged to contribute and commercial interests are aligned, and where the focus is on maximising project performance, is critical to drive industry resilience."

Echoing previous comments, Lorenzo Simonelli, chairman, president and CEO of Baker Hughes, a GE Company, underlined the importance of addressing negative perceptions of the oil and gas industry and better communicating its role in bringing energy to the world where over a million people still do not have access to electricity.

"In the coming decades, notwithstanding all the benefits that come from renewables and clean energy, it is clear that the energy transition is dependent on what we do as the oil and gas industry, and in particular how we manage the energy transition successfully," he said.

Highlighting the importance of collaboration, he mentioned the BHGE partnership with ADNOC which is driving integrated well services and "changing the way in which we can have an impact and outcome in working together." The industry needs to look at new ways of working and take best practices from other industries, he added.

Technology as an enabler

Discussing technology as an enabler, he highlighted the importance of accelerating innovation to reduce the industry's carbon footprint. BHGE is looking to reduce its carbon footprint by 50 per cent by 2030, and by 2050 to be net carbon neutral. One of the company's latest technologies is a digital platform which monitors methane emissions. He also mentioned its project in Iraq which converts flared gas into energy. "Around the world flaring is an issue, but we have the technology and capability to transfer that gas into electricity or transport fuel as LNG or CNG."

"Digital will have a big impact, if you look at the way smart drill bits, integrated drilling solutions, the capturing of data gives us more insight and capabilities," he went on. "And it's important we use these to make decisions that are relevant. Today only two to three per cent of the data captured across the industry is actually utilised. We also don't have an ecosystem where we all look at the data together, and it's critical that we start to share that information."

The industry can prosper by helping the communities its serves to prosper as well, Simonelli maintained.

"There is a tremendous power in being local but playing global," he said, highlighting the importance of training and developing employees, as the company is doing in Saudi Arabia with the IKTVA programme. "So there's a social licence to operate that we need to communicate as an industry as we go forward."

"As we go forward resilience isn't about the oil price," he concluded. "We've got to a stage when we can manage through the oil price volatility. It's about the impact we're having outside our industry, and how we make sure we tackle it head on as an industry and start to drive a different message.

"It's a defining time for this industry as we go forward."

Fuad Krekshi, executive vice president, Middle East region, Eni, shared Eni's recipe for resilience in the downturn and its approach to remaining competitive in the future. "In the past four years Eni went through major transformation operationally and financially, which enabled it to increase hydrocarbons production at time of low oil prices and post positive financial results after years of losses," he said.

Eni has pursued a distinctive approach to exploration and upstream activities based on operational, environmental and economic efficiency which features strong competence in conventional exploration, a competitive, low-cost structure, and optimisation of all project phases. "We remain conventional and we avoid areas requiring complex development, preferring to focus on areas of undiscovered near-field resources to exploit the synergies with existing facilities," he said.

> "Digital transformation accelerates business opportunities."

This strategy has paid off, resulting in the discovery of around 5bn bbl of resources from 2014-2018 with a current value of US$8.3bn, and competitive exploration costs of US$1.5 per barrel of oil produced, continuously improved by finding low-cost resources such as the recent discoveries in Egypt and Mexico. Selling minority stakes in projects while maintaining ownership, and proceeding with different phases and processes in parallel, has allowed the company to deliver projects ahead of schedule and on budget.

R&D will play a crucial role in the future for the identification and development of technological breakthroughs, as well as innovative solutions that can increase efficiency and effectiveness, he said.

Image Credit : vectorfusionart/Adobe Stock

R&D will play a crucial role in identifying and developing new technological breakthroughs.

The digital transformation can support the energy transition, increase production recovery, reduce production losses and contribute to operational efficiency, he added. Another benefit is an increase in environmental efficiency and reduction of emissions. "Eni strongly believes that digital transformation accelerates business opportunities," he concluded. ■

Record attendance at MEOS 2019

The 21st edition of the Society of Petroleum Engineers Middle East Oil & Gas Show and Conference (MEOS 2019) held in Bahrain from 18-21 March attracted a record total of 9,144 attendees, marking a 9.8 per cent increase over the 2017 edition and reaching a new high in the 40-year history of the event.

ATTENDANCE GROWTH WAS matched by a 5.2 per cent increase in exhibitor participation numbers at the 12,000 sq m exhibition of oil and gas products featuring 203 companies from 27 countries.

The parallel conference took place under the theme 'Resilience through Talent and Technology Transformation.' More than 400 expert speakers reflected on how the industry can meet world energy demand efficiently, responsibly and with maximum value, with a focus on Fourth Industrial Revolution technologies, collaboration, and nurturing the next generation.

MEOS 2019 was held under the patronage of the Prime Minister of Bahrain HRH Prince Khalifa bin Salman Al Khalifa. The event was supported by the Bahrain National Oil and Gas Authority and a committee of IOC and NOC representatives chaired by Saudi Aramco and Petroleum Development Oman.

Bahrain's Deputy Prime Minister HE Shaikh Khalid bin Abdulla Al Khalifa performed the exhibition opening ceremony on 19 March 2019 at the Bahrain International Exhibition and Convention Centre, during which he emphasised the Bahrain government's commitment to upgrading the oil industry to benefit the national economy. Innovative new products on display ranged from BHGE's methane monitoring platform, LUMEN, to Hammertech's low-cost water fraction and salinity measurement meter and Hunting's organic oil recovery process. Saudi Aramco's stand featured game-changing technologies such as its Spicerack AUV, a fully automated seismic data acquisition system, which is due to be piloted in the Red Sea (see page 42).

The conference opened on 18 March 2019 at the Ritz-Carlton hotel and was followed by the inaugural MEOS Energy Awards. Welcome addresses were delivered by Bahrain's Minister of Oil HE Shaikh Mohammed bin Khalifa bin Al Khalifa; MEOS 2019 co-chairman and Saudi Aramco's chief petroleum engineer Waleed Al Mulhim, and the 2019 SPE president Sami Alnuaim.

Image Credit : AEM UBM

Attendance at MEOS 2019 hit a 40-year high.

The Minister of Oil shared progress on Bahrain's biggest oil and gas find since 1932 – estimated to contain more than 80 billion barrels of tight oil and up to 20 trillion cubic feet of deep natural gas – and highlighted opportunities for future co-operation.

Waleed Al Mulhim declared MEOS was a bright spot for the region and the industry alike, saying, "MEOS provides an opportunity looking beyond the industry; focusing on collaboration with business, educational institutions, governments and society. We need joint development of new technologies that will increase discovery and recovery, reduce cost, enhance safety and protect the environment."

Sami Alnuaim stressed that the Middle East will remain the "powerhouse of the world's oil and gas industry", with vast proven resources and promising new discoveries. Introducing some of the conference themes, he highlighted the role of digitalisation and elements of the Fourth Industrial Revolution as essential tools to drive continuous improvements in safety, cost, efficiency and competitiveness. He also stressed the role of oil and gas in the energy transformation and efforts to tackle the climate change challenge.

At the opening executive plenary session, presidents and CEOs from Saudi Aramco, Schlumberger, BHGE ad Eni reflected on resilience from both operator and service company perspectives (see page 11).

More than 360 technical and e-poster presentations designed to share the knowledge and experience of managing, operating and supplying oil and gas companies followed over the subsequent three days of the conference.

Other conference highlights included a keynote session exploring how the oil and gas sector is adapting to demands for cleaner technologies and energy sources, six high level panel sessions, a workshop sharing best practices to support a diverse workplace, and a three-day programme of events aimed at nurturing the next generation of oil and gas professionals. ■

The next edition of MEOS will take place from 15-18 March 2021 in Bahrain.

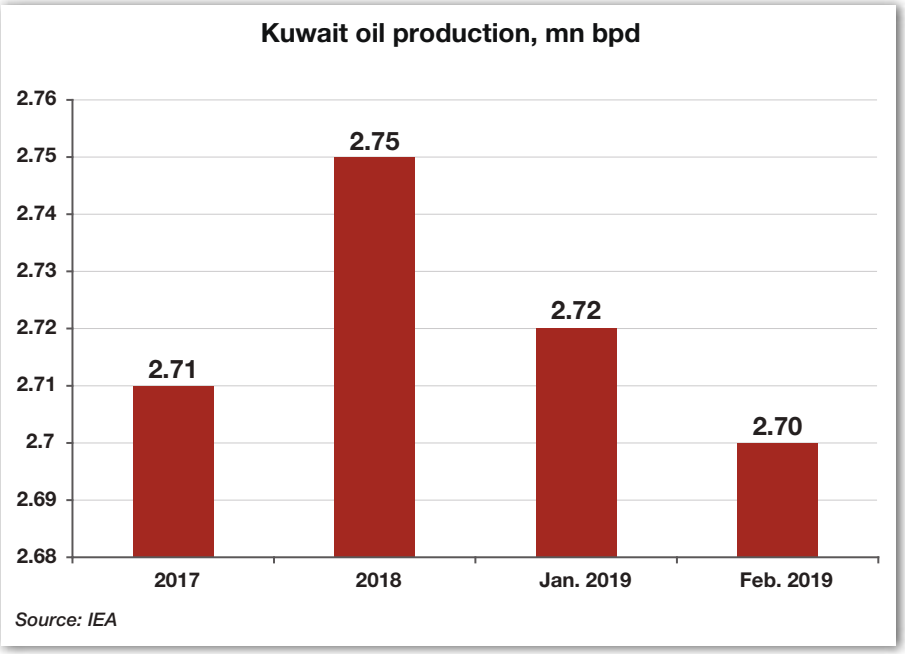
Challenges and opportunities in Kuwait's oil sector

Kuwait's oil is enjoying Asia market success amid some upheaval back home, says Martin Clark.

THESE HAVEN'T BEEN the easiest of times for Kuwait's energy sector, with frequent oil ministry comings and goings over recent years. Nonetheless, Kuwait Petroleum Corporation (KPC) and other state-owned energy companies have done a commendable job in keeping the ship steady despite all the political upheaval in the corridors of power.

Crude oil production is now averaging around 2.7mn bpd, although that's not been without facing up to some mighty challenges – from labour strikes to refinery fires and oil spills.

Indeed, KPC itself is having to adjust to a new personnel change with the appointment of Hashem Sayed Hashem as its new chief executive at the turn of the year. However, as a former head of the upstream unit, Kuwait Oil Company (KOC), he will be all too familiar with the challenges of working within the nation's most vital and strategic industry.



Asia focus

It is an industry shifting its focus increasingly towards higher growth markets in Asia. That has meant securing a toehold in new refinery projects overseas and directing almost all of its exports eastwards – last September marked the first month since the 1990-91 Gulf War that no Kuwaiti oil was shipped to the United States.

While Asia has long dominated Kuwaiti oil sales, it is only more recently that KPC and its subsidiaries have moved to shore up their markets and interests abroad. Kuwait Petroleum International (KPI) now owns a 35 per cent stake in Vietnam's US$9bn refinery in Nghi Son, around 200 km south of Hanoi, the capital. It was designed to solely process Kuwaiti crude and has a capacity of up to 200,000 bpd.

Naturally, Kuwait is eyeing up the mighty China market as well. The country last year signed a memorandum of understanding with Chinese energy major Sinopec to build a refinery in the south of China, while Kuwait also has a crude oil supply arrangement with PetroChina.

> "It is an industry shifting its focus increasingly towards higher growth markets in Asia."

Upstream oil

Perhaps the best part of these overseas successes are the distraction they provide from activities back home. Upstream, Kuwait's crude oil production has failed to hit ambitious earlier targets: originally, the aim was to grow capacity to three million bpd, then to 3.5 million bpd, reaching four million bpd by 2020.

That is now an impossibility, given that the industry is struggling to reach the three million bpd milestone in 2019.

It is not hard to find reasons why. Production from the jointly run oilfields of Khafji and Wafra in the so-called Neutral Zone with Saudi Arabia was halted more than three years ago, cutting off some 500,000 bpd (of which Kuwait nets approximately half). There are reports that a resumption is not close due to operational differences and souring political ties between the previously close Gulf allies.

There are some positives though, including a thaw in relations with Iraq, as the two sides work together to assess areas with oil reserves on their border. Iraq's oil minister Thamir Ghadhban said at the end of 2018 that the countries had selected a consultant to study the border reserves and would determine a production policy based on the results.

Gas sector

The gas sector is more dynamic with Kuwait looking to raise non-associated gas production to meet rising domestic demand and free up more oil for export rather than power generation.

Most gas production comes from associated fields, thereby linked to oil production, though it also produces non-associated gas and condensates from the


Image Credit : KPI

Kuwait is focusing increasingly on petrochemicals, both at home and abroad.

Jurassic gas fields in the north. Here, the completion of a second phase of the Jurassic gas project has boosted non-associated gas output from 1.8 billion cubic metres (bcm) to more than 5.3 bcm and 175,000 bpd; it has also significantly pushed up condensates output from 55,000 bpd to 175,000 bpd. Further expansions are planned, which could almost double these figures.

Unfortunately, slow progress in developing these resources means Kuwait has already turned to foreign imports to meet domestic needs in the shape of liquefied natural gas (LNG). Kuwait is now using two floating regasification units for its gas import supply. According to analysts, any increase in local production is unlikely to displace the need for LNG imports anytime soon.

"Our forecasts indicate a net increase of gas imports from around five bcm in 2016 to more than 15 bcm by 2027, driven by the need to satisfy rising household consumption, power generation and petrochemicals production," commented analysts Fitch Solutions in a December 2018 industry briefing.

Downstream

Of course, the flagship piece of Kuwait's current energy jigsaw is the giant US$27bn Al-Zour refinery and downstream complex. The centrepiece is the delayed 615,000 bpd oil refinery, currently under construction, which is now said to be around 80 per cent complete.

It also includes a permanent onshore LNG processing facility to replace the floating terminals, as well as a state-of-the-art petrochemicals complex. It underlines just how much is going on in Kuwait's energy sector, though again, how things do not always go as smoothly as hoped.

Last year, KPC announced plans to spend US$500bn on capital projects through to 2040, though, as ever, things are rarely straightforward. Indeed, the country may be moving to restructuring the shape of its energy industry soon, amid reports that KPC will combine its eight business units into four, in order to streamline the company.

> "The flagship piece of Kuwait's current energy jigsaw is the giant US$27bn Al-Zour refinery and downstream complex."

That could potentially put the brakes on its mega spending plans, although these are big political decisions which, experience shows, do not happen quickly or painlessly in Kuwait.

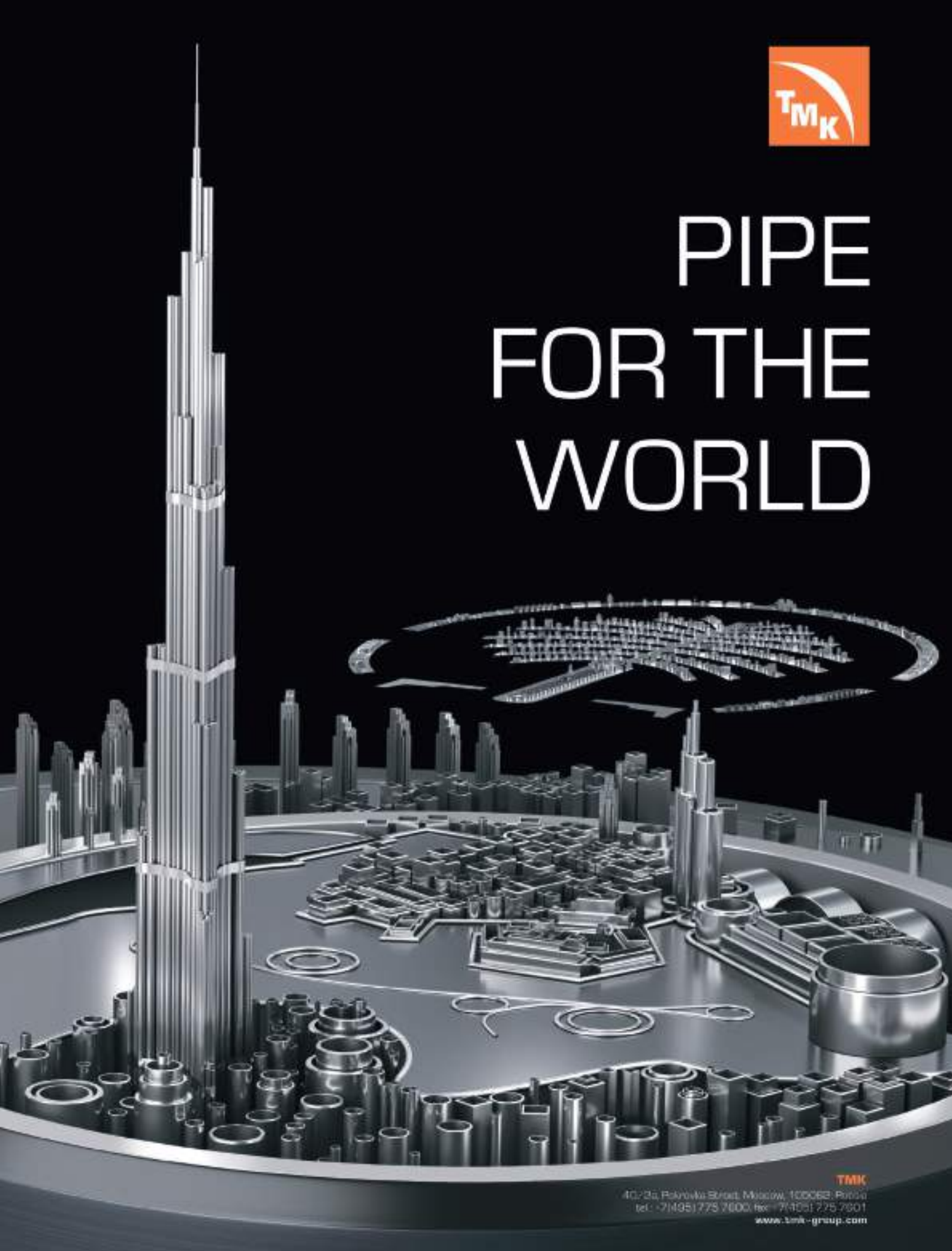
What the country does have in abundance are its reserves and, indeed, the goodwill from its partners, not just its new customers in Asian markets, but from traditional suppliers too. The UK government credit agency, UK Export Finance, recently signed a memorandum of understanding for up to US$3bn in loans and credit facilities in support of British goods and services exports in projects carried out by KPC and its subsidiaries.

Renewables

Going forward, Kuwait has its sights set on the expansion of its clean energy sector as well, with the growth of the high potential renewables industry. While this has moved at pace elsewhere in the Gulf, notably Abu Dhabi, Kuwait has started late, although it is now seeking to make up for lost time. There are plans to grow the use of solar and other renewable power to make up around 15 per cent of Kuwait's energy mix by 2030.

Among the flagship projects underway is the 1.5 gigawatt (GW) Al Dibdibah solar park, which comprises five separate units. Now under development, it will be one of the biggest of its kind in the world when completed; it is scheduled to be commissioned in 2021.

With the introduction of dependable solar electricity, harnessing the power of the sun, Kuwait will also be able to free up more of its oil and gas production for export and other uses. It is simultaneously linking this development with skills and worker initiatives to bring in new jobs and competencies in order to continue evolving the energy sector. Contractors working on the solar park and other energy projects must secure a third of materials and services from local firms. Long-term, this is expected to have an impact across the economy, as Kuwait seeks to assert its position in a fast-changing global energy landscape. ■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Middle East oil companies boost global petrochems footprint

The future for hydrocarbons lies in chemicals, and Middle East oil companies have plans to bring on massive amounts of capacity, says Joseph Chang, global editor, ICIS Chemicals Business.

WHILE THE US cracker wave on the back of the shale gas boom is getting much of the attention, big oil and gas players in the Middle East are lining up mega projects that could shift the landscape of global petrochemicals from 2025 and beyond.

Driving this push from oil companies is the growing realisation that oil demand for transportation fuel will plateau with the electrification of vehicles and improving fuel efficiency. Thus, the future for hydrocarbons is not in gasoline and diesel, but in chemicals, where demand should continue to climb alongside GDP growth.

And it is clear that "Big Oil" is no longer satisfied simply providing feedstock for the downstream chemical sector.

Massive petrochemicals projects are underway in the Middle East.

Image Credit : tonjung/Adobe Stock

ADNOC'S US$45bn investment plan

Abu Dhabi National Oil Company (ADNOC) wants to "stretch the dollar" from the barrel of oil to the maximum through producing chemicals, said CEO Sultan Ahmed Al Jaber.

ADNOC is embarking on a US$45bn investment plan with a goal to more than triple petrochemicals capacity at its Ruwais site from a 2016 base of 4.5mn tonnes/year to 14.4mn tonnes/year by 2025, and adding new downstream product chains in construction chemicals, oilfield chemicals, surfactants and detergents.

In February 2019, its 50/50 joint venture company Borouge awarded front-end engineering and design (FEED) contracts for the fourth phase of its expansion in Ruwais, which will include a 1.8mn tonne/year mixed feed cracker and add a total of 3.3mn tonnes/year of olefins and aromatics capacity.

The cracker will be the first in the country to use mixed feeds. The feedstock slate will be ethane, butane and naphtha.

"The Middle East is running out of cheap natural gas. All new projects are mixed feed, with a typical mix of about 35 per cent ethane, and 65 per cent propane, butane and naphtha which is not as advantaged as ethane," said Hassan Ahmed, analyst at US-based investment research firm Alembic Global Advisors.

While ADNOC and JV partner Borealis plan to finalise the downstream configuration within three months of the FEED contract awards, it should include polyethylene (PE) and polypropylene (PP).

Aramco's COTC and US$100bn plan

Saudi Aramco's planned crude oil to chemicals (COTC) complex with SABIC in Yanbu, Saudi Arabia is perhaps the most watched project on the planet as it could have significant implications for the petrochemicals sector. In late March, Aramco agreed to buy a 70 per cent stake in SABIC from the Public Investment Fund of Saudi Arabia in a US$69.1bn deal, taking control and effectively merging the Kingdom's energy and chemical giants into an integrated, international powerhouse.

MIDDLE EAST MEGA PROJECTS

'000 tonnes/year

Company	Type	Products	Capacity	Location	Cost	Start-up
Saudi Aramco/Total	Mixed feed cracker	Ethylene and derivatives	1,500 (ethylene)	Jubail, Saudi Arabia	US$5bn	2024
Saudi Aramco/SABIC	Crude oil-to-chemicals	Petrochemicals, base oils	9,000 total*	Yanbu, Saudi Arabia	US$30bn	2025
ADNOC	Mixed feed cracker, other	Olefins, aromatics, polyolefins, surfactants, specialty chemicals	9,900 total**	Ruwais, Abu Dhabi	US$45bn	2025

** May be much higher, depending on crude oil conversion rate*

*** Planned capacity to achieve its goal of 14.4mn tonnes/year of petrochemicals capacity by 2025. Includes a Borouge mixed feed cracker of 1.8mn tonnes/year and a total of 3.3mn tonnes/year of olefins and aromatics*

MIDDLE EAST COMPANY MEGA PROJECTS ABROAD

'000 tonnes/year

Company	Type	Products	Capacity	Location	Cost	Start-up
SABIC/ExxonMobil	Petrochemicals	Ethylene, PE, MEG	1,800 (ethylene)	San Patricio County, Texas, US	NA	2022
Saudi Aramco/NORINCO/PanjinSincen	Refinery, petrochemicals	Olefins, aromatics	1,500 (ethylene),	Liaoning, China	US$10bn	2024
Saudi Aramco/ ADNOC/India consortium	Refinery, petrochemicals	Petrochemicals	18,000 totall	Raigad, India	US$44bn	2025
SABIC/Fuhaichuang Petrochemical	Petrochemicals	Olefins	1,800 (ethylene), 600 (propylene via PDH)	Zhangzhou, China	NA	NA

Featuring a budget of around US$30bn and a process to convert 400,000 bbl/day of crude oil to 9mn tonnes of chemicals and base oils, the Aramco/SABIC COTC mega complex is expected to start operations in 2025. The initial plan was to convert 45 per cent of each oil barrel to petrochemicals. However, Aramco aims to boost that figure significantly by advancing its proprietary process technology, using which it believes it can convert between 60-70 per cent of the oil barrel into petrochemicals.

Petrochemicals are averaging around 10-15 per cent of global refinery output, with wide differences between integrated complexes.

"In recent years, refiners have increasingly raised their share of petrochemical output at the expense of traditional fuels. Some of the new refineries in China can convert up to 40 per cent," according to Stefano Zehnder, vice president of consulting at ICIS.

"In Saudi Arabia the original base concept is rapidly evolving. It's clear Aramco is looking to scale up to commercial size its crude-to-chemicals technologies," said Zehnder.

"With the potential for further increase from the base 45 per cent yield, this points to even higher petrochemicals and base oils capacities than the 9mn tonnes/year base. The final configuration will be function of the desired balance between petrochemicals, base oil and fuel products," he added.

Ahmed from Alembic Global Advisors notes that crude-oil-to-chemicals is all about "integration and trying to be more efficient both upstream and downstream". That is because "every new facility in the Middle East puts them higher on the cost curve", a function of the mixed feedstock slate.

Aramco plans to invest an eye-popping US$100bn in petrochemicals over the next 10 years, CEO Amin Nasser said at the Gulf Petrochemicals Association (GPCA) annual meeting in Dubai in November 2018.

In October 2018, Aramco and France-based Total signed a joint development agreement for the front-end engineering and design (FEED) of their planned joint venture petrochemicals complex in Jubail, Saudi Arabia. The US$5bn project, slated for start-up in 2024, will comprise a mixed-feed (50 per cent ethane, 50 per cent refinery off-gases) cracker with 1.5m tonnes/year of ethylene capacity and downstream units.

The petrochemical complex will be downstream of Aramco and Total's joint venture SATORP refinery and the companies expect an additional US$4bn in investments in petrochemicals and specialty chemicals capacity from third-party investors.

Mega projects worldwide

Aramco and Abu Dhabi's ADNOC are not only ploughing investment dollars in their backyards but setting up mega complexes around the world. The most ambitious among these is the memorandum of understanding (MoU) signed in June 2018 between Aramco, ADNOC and a consortium of Indian oil companies (Indian Oil, Hindustan Petroleum, Bharat Petroleum) to build a US$44bn refining and petrochemicals complex in India with 18m tonnes/year of petrochemicals capacity.

Aramco and ADNOC would jointly own 50 per cent of the project, with the Indian consortium owning the other half. The Indian government expects construction to start in 2020 in Raigad, India with completion of the project by 2025.

Alembic Global Advisors' Ahmed cautions against raising expectations from MoUs.

"The Crown Prince of Saudi Arabia went on a tour across Asia and many MoUs were signed. But MoUs sometimes don't materialise. Until we see steel in the ground, we typically don't take them too seriously," he said.

China is another target for Middle East oil companies. In February 2019, Aramco signed an agreement with China's NORINCO Group and Panjin Sincen to develop a US$10bn-plus fully integrated refining and petrochemical complex in Liaoning, China with start-up expected in 2024.

The partners will create a new company, Huajin Aramco Petrochemical (Aramco 35 per cent, NORINCO 36 per cent, Panjin Sincen 29 per cent), as part of a project that will include a 300,000 bpd refinery with a 1.5mn tonne/year cracker and a 1.3 tonne/year paraxylene (PX) unit. Aramco will supply up to 70 per cent of the crude oil feedstock for the complex.

SABIC merger to bring projects

And Aramco is inheriting two additional mega projects in its planned merger with SABIC.

SABIC and China's Fuhaichuang Petrochemical are planning to jointly build a petrochemical complex in Fujian, China, a source from Fuhaichuang said in late February. The project, to be located at Gulei in Zhangzhou would include a 1.8m tonne/year cracker, a 600,000 tonne/year propane dehydrogenation (PDH) unit and derivatives units, according to the Fuhaichuang source. An official deal has yet to be finalised.

One SABIC mega project is already underway. On the US Gulf Coast, SABIC and ExxonMobil are building a 1.8m tonne/year ethane cracker in San Patricio County, Texas, with a monoethylene glycol (MEG) plant and two PE units downstream. Project completion is expected by the fourth quarter of 2021 and start-up in the first half of 2022.

Beyond the merger between Aramco and SABIC, Middle East oil companies could seek to acquire Western petrochemical assets. Aramco acquired Germany-based LANXESS' synthetic rubber business by buying out the latter's 50 per cent stake in their ARLANXEO joint venture in December 2018, while SABIC took a nearly 25 per cent stake in Switzerland-based specialty chemicals and catalysts company Clariant in September.

Earlier major deals included SABIC's acquisition of US-based GE Plastics in 2007 and Abu Dhabi's IPIC (now Mubadala) buying Canada's NOVA Chemicals in 2009.

"They would be still be interested but we would not expect them to go too far from their comfort zone in olefins and polyolefins, and possibly in polyurethanes. We think they would look to the USA rather than Europe," said Ahmed from Alembic Global Advisors.

It is clear Middle East oil companies have giant ambitions in petrochemicals with plans to bring on massive amounts of capacity by 2025. However, it remains to be seen what projects actually start up and in what timeframe.

"The devil's in the details in terms of what gets built, delayed and cancelled. We all know the game of companies throwing down big numbers to prevent competitors from overbuilding," said Ahmed. ■

Additional contributions by ICIS editors Nigel Davis, Nurluqman Suratman, Niall Swan and Fanny Zhang. ICIS is the world's largest petrochemical market information provider with divisions spanning energy and fertilisers. www.ICIS.com

Sour oil & gas in focus at SOGAT 2019

SOGAT 2019, which takes place from 29 April to 2 May in Abu Dhabi, will review and showcase all the latest developments in global sour hydrocarbon management at a time when sour field development plans abound throughout the region.

FIELDS IN THE Middle East with high H2S and C02 account for 60 per cent of the world's proven sour gas reserves, and major projects to develop these are underway to keep pace with rising demand.

The recent announcements from ADNOC in partnering with ENI, Wintershall and OMV in the Ghasha ultra sour gas concession and Total in the Ruwais Diyab concession, and further intentions to develop Bab and Bu Hasa within the US$20bn sour gas field development, not only indicate the importance of sour hydrocarbon and unconventional field development but also contribute to the strategy to make the UAE gas self-sufficient and ultimately a net gas exporter by 2025.

Saudi Arabia is aiming to produce 70 per cent of its power requirements from natural gas, and Saudi Aramco is focusing on enhancing sour gas conditioning as part of a US$4bn scheme to boost gas production for domestic consumption with the expansion of the Hawiyah Plant processing capacity to 1.2bn scfd. Shortly the industry will also see the Fadhili Plant producing gas from the Kursaniyah and Hasbah Fields, and the 75million scf/d gas processing plant at Midyan in full operation. Additionally there are significant plans for the development and processing of expected big volumes of shale gas in the Jafurah Basin.

These activities are all part of the KSA Master Gas Plan in which capacity will eventually increase to 23 billion scf. Moreover an expected investment of US$150bn over the next decade in gas development will result in Saudi Aramco too becoming a gas exporter.

Oman is processing gas from the Khazzan Field with 950 mcf/d of produced gas, and SNC Lavalin continues to support the process of bringing on-stream the necessary gas from both the Rabab Haheel and Kibal Khuff projects, the former being one of the largest projects in Oman's energy development history. Earlier this year PDO announced a significant gas find with estimated recoverable reserves of more than four trillion cubic feet (tcf) and 112mn barrels of condensate, which will add to their gas needs.

In Kuwait, KOC awarded a US$1.3bn contract to Petrofac for a sour gas gathering system for the Burgan Field, and plans continue to unleash the potential of the sour gas resources within the Jurassic Gas

Saudi Aramco's Fadhili gas plant will shortly produce gas from the Kursaniyah and Hasbah fields.

Image Credit : Saudi Aramco

project to deliver one Bcf/d by 2020. KOC is working on three production facilities with the latest project, JFC-1, providing 590Mcf/d of sour gas. Bahrain last year announced an onshore gas find of 13.7 tcf, which will require international support in its development.

Showcase for innovative technologies

The technologies involved in sour field development and production continue to progress, and the latest developments across the whole sour hydrocarbon management spectrum will be included in the well respected SOGAT conference programme, which focuses on operational case studies and new technology innovations in sour hydrocarbon conditioning. Presentations include New Practices with Mole Sieves; New H2S Membrane Removal Technology; Optimising Energy Consumption in Sour Gas Processing; Effect of O2 Concentration on SRU Efficiency; Smart Solutions for Operational Excellence in the SRU; and New Technology for Reducing Amine losses.

Emerson will present their new wireless toxic gas monitor, while INEOS will present their solution to overcoming problems associated with large amounts of amine losses through vaporisation.

As in previous years, in-depth and practical workshops on topical issues that contribute to enhancing efficient operations will take place covering Practical Amine Treating, Sulphur Recovery Practices, Process Modeling, AGI and Contamination Management.

The SOGAT exhibition will see leading and new vendors and suppliers present their technologies. New exhibitors include Bilfinger Tebodin Middle East and CSI Ametek, with the latter demonstrating their ICOn degassing system which reduces potential exposure to H2S in sulphur storage and handling as well as improving vapour recovery operations in the sulphur pit.

SOGAT has grown to be recognised as the premier event focusing on sour hydrocarbon developments in the Middle East. SOGAT 2019 is supported by ADNOC with attendees expected from ADNOC Onshore, Gas Processing, LNG and Sour Gas, along with delegates from KNPC, PDO, Saudi Aramco, IOCs as well as leading service companies and contractors including UOP, OXY, Air Liquide, BASF, Huntsman, ORTLOFF, Jacobs, Honeywell and Aspen Technology.

"This well respected event will again provide a one-stop opportunity to be involved in the debate and networking on subjects that focus on the region's priorities in hydrocarbon conditioning, not only in the SOGAT conference but also in the practical and in-depth SOGAT workshops", said Dr Nick Coles, conference director at organisers Dome Exhibitions.

"I look forward to welcoming you and your colleagues to SOGAT 2019 at a time when the IOC involvement in the Ghasha concession points to ADNOC developing a centre of excellence for sour gas."■

For further information see the website at www.sogat.org.

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Geochemistry moves to the **wellsite**

Surface logging services provider GEOLOG describes a new method of H2S mapping in reservoirs.

ACID GAS CONTAMINATION of hydrocarbon resources is a growing issue, an increasing number of new discoveries being affected by the presence of non-hydrocarbon gases. Although today very sour hydrocarbons may be economically produced, the cost involved can heavily affect profitability. H2S is one of the most frequent contaminant gasses occurring in reservoirs, and its distribution mapping can greatly help in optimising completion and, more importantly, in reducing development costs.

Detection of H2S is no easy task: as an acid gas it readily dissolves in alkaline water-based mud, but it is also removed by scavengers purposely added to any type of mud to prevent the uncontrolled release of H2S at surface. Inorganic scavengers (zinc and iron complexes), have a long history of use and will easily release H2S captured in the well after acid treatment. These are now being replaced by organic scavengers, such as triazine, which have an irreversible reaction with H2S. Existing methods of detecting H2S as free gas, and via acid decomposition of sulfides formed with inorganic scavengers, will not work with organic scavengers and as such, detection of H2S distribution along the well profile is becoming increasingly problematic.

A new method based on detecting H2S within the pore structure of cuttings has been successfully tested and applied. The concept behind this method is that gases contained within the rock's pore network are not fully released from cuttings at surface and that a residual part of them can be freed and detected if the cuttings are ground in a sealed vessel, destroying the rock and pores.

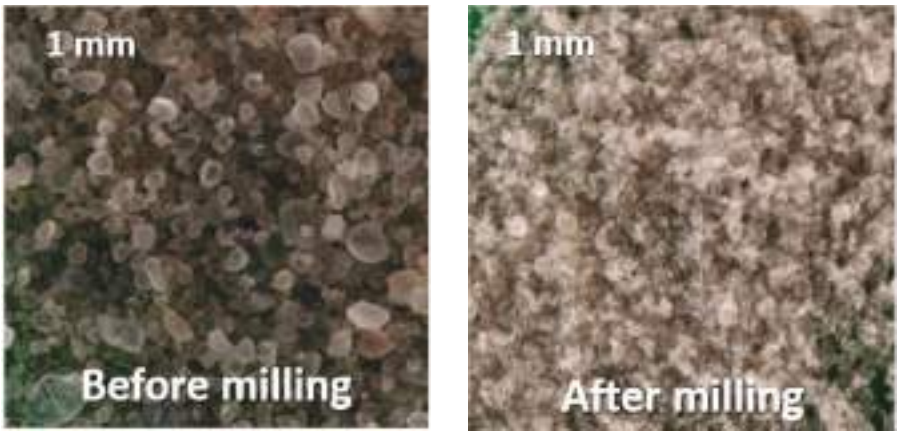

Image Credit : GEOLOG

Cuttings before milling, still containing H2S, and after milling.

> "Detection of H2S distribution along the well profile is becoming increasingly problematic."

The methodology is quite simple: cuttings are placed in a sealed container and ground to a defined size. The gas released by pore destruction and trapped within the container is swept from the container by a carrier gas and introduced into a micro GC with TCD detector for analysis. Analytical GC turnaround time is 90 seconds and the full process (sample preparation, grinding and GC analysis) takes 15 minutes when performed at the well site. The permeability of the cuttings samples plays a key role in preservation of H2S within the cuttings, however acquired experience shows that only in the case of very high permeability rocks is gas is not preserved at all.

To validate the results, natural hydrocarbon gas (C1-C5) analysis is performed in a similar way, the presence of this natural gas confirming the existence of pores with residual gas and further validating the reliability of H2S mapping. The measured abundance of H2S can be considered as a relative indication, obviously affected by permeability values, however these data can be usefully used to map H2S occurrence in the reservoir. ■

Image Credit : Alexey Filatov/Adobe Stock

H2S is prevalent in Middle East reservoirs.

The ABC of petroleum measurement uncertainty

Brendan Robson, consultant engineer at TUV SUD NEL, underlines the importance of accurate measurement uncertainty analysis for the calibration of storage tanks.

LARGE STORAGE TANKS made of steel sections riveted or bolted together have been used throughout the world for many years, and there are usually numerous tanks in a 'tank farm'. The accuracy of measurement uncertainty analysis directly impacts fiscal accuracy (profit and taxation). A typical final volume of +/- 0.25 per cent does not seem a lot, but at recent world prices and total quantities, that 'error' would represent around US$3.6bn per year.

Traditional techniques for calibrating storage tanks used high quality metal measuring tapes, under skilled usage, to measure circumferences at increments up the height of the tank – hence the final 'strapping chart' giving dip height to volume. Today, optical surveying methods are used to calibrate storage tanks, but still rely on an initial physical circumference measurement by precision tape. But the uncertainties of measurements cannot be simply combined. For this we must perform an 'uncertainty analysis'.

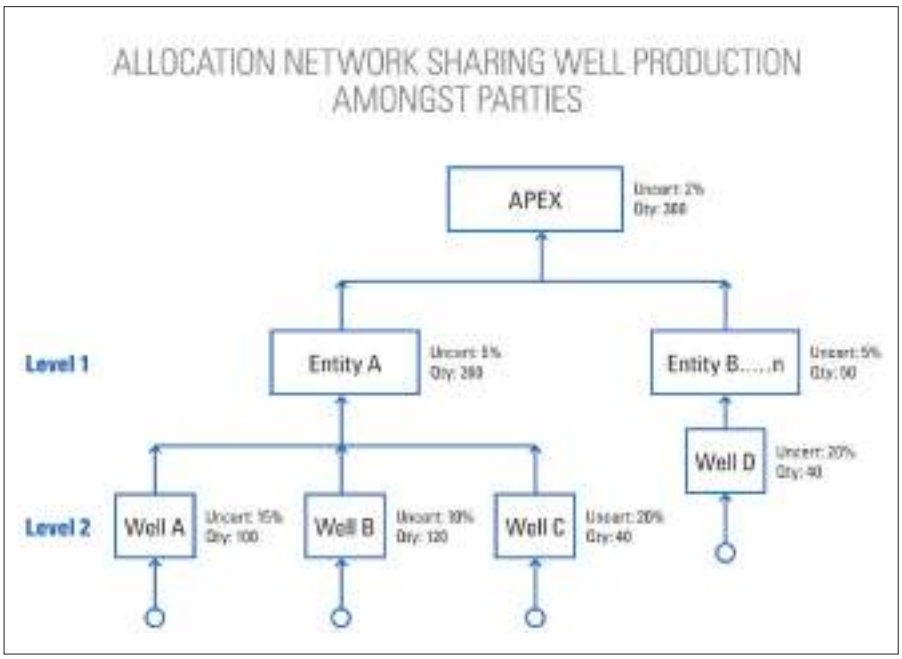

Image Credit: NEL

Figure 1: Allocation network sharing well production among parties.

Applying ABC

All measurements have a level of uncertainty; there is no 'exact' value. You may want consultation, advice or training in identifying the variations in your measurements, how to manage them and their combined effects. However, always remember, you are the best source of information on the details of your own systems. Also, recall your "ABCs".

A critical stage is the technical audit ("A") of the system, which investigates the measurements and assesses the contributory factors that affect the final result. For oil pipelines, the flowmeter's reading and uncertainty can be directly related to revenue (the so-called 'cash registers' of oil transfer). However, as flow is a derived quantity, a number of measurements are required: mass, time, temperature, pressure, fluid properties (density, viscosity, etc), amongst others. Each of these quantities has a measurement uncertainty. Using established statistical standards, we can combine these into an 'uncertainty budget.'

> "The accuracy of measurement uncertainty analysis directly impacts fiscal accuracy"

The uncertainty budget (UB, or just 'B') is a table, or collection of tables. These are used to analyse the variations in the contributory measurements and give visibility, or even control, of the results. The UB is a tool that can help identify where you should improve measurements.

Returning to storage tanks, ISO 7507 includes an uncertainty analysis for tank calibration, while its cousin, API 2.2, is still considering including this valuable assessment.

Finally, the 'C' of your "ABCs" stands for calibration. By ensuring that the critical instruments are calibrated, the values in the UB's calculations are traceable. As an example, the amount of effort and cost to calibrate your ultrasonic flow meter should aim to satisfy your target acceptance. It may be required to trace a chain of calibrations all the way to a National Measurement Institute (NMI) with the associated qualification of an ISO 17025 certificate or report. These "ABCs" spell out the assurance of accurate measurement.

Bunkering and pipeline networks

A major European pipeline operator recently commissioned an investigation into its instruments and processes employed in their bunkering transfer from oil tankers to shore-based tank farms and onwards through their network of pipelines. The resulting UB was

incorporated into the live data feed from transfer operations, which immediately showed the operators if the tanker's Bill of Lading was outside acceptance limits while the ship was still docked. Additionally, the measurement audit uncovered a US$16,000 discrepancy caused by incorrect tank volume table hidden inside the farm SCADA.

If you consider the other end of the production chain and pipelines: the raw well-heads (Figure 1) "allocation" analysis, including critical uncertainties, leads to legal agreements between parties and splits in the revenue, while sharing essential infrastructure.

When uncertainties in the flow are included, then the agreement can be better understood and the allocation defended. Again, it is the proper appreciation and application of measurement uncertainty that maintains confidence in the result. The pipeline networks for well-heads can also be tiered, which adds significant complexity in the uncertainty analysis.

> "It is the proper appreciation and application of measurement uncertainty that maintains confidence in the result"


Image Credit: NEL

Brendan Robson, consultant engineer at TUV SUD NEL.

Pipeline integrity is also high on the monitoring requirements around the world. These are balanced by network performance and maintenance management with the target of being preventative or even predictive. Developments in monitoring systems and data handling are healthy, but not without potential drawbacks. The lack of measurement uncertainty in such systems can have dire consequences.

You must therefore understand the measurement system and processes in order to properly appreciate the uncertainty components and build an uncertainty budget. This will establish a sound foundation to ensure that your measurements are understood, suitable and cost-effective. ■

TUV SUD NEL is a provider of technical consultancy, research, testing and programme management services. Part of the TÜV SÜD Group, TUV SUD NEL is also a global centre of excellence for flow measurement and fluid flow systems and is the UK's National Measurement Institute for Flow Measurement.

The benefits of ELB technology

Electronic Line Break (ELB) technology offers a reliable safety solution for gas pipelines in remote areas, says leading actuator manufacturer and flow control company Rotork.

RELIABLE TECHNOLOGY CAPABLE of quickly isolating a break in remote gas pipelines is a major factor in maintaining the efficiency and safety of many midstream processes.

Combined with a fluid power actuator, an Electronic Line Break (ELB) device is an ideal way to overcome the challenges faced by operators attempting to transport gas from extraction sites and across miles of land to reach refineries.

The key task an ELB device must fulfil is to quickly identify and facilitate the isolation of a ruptured section of a pipeline and relay accurate data about the condition and functionality of the rest of the system. Although the ELB itself makes no difference to a pipeline's reliability, when used in conjunction with other equipment it can help to reduce damage to equipment and the environment, while minimising financial losses as a result of a leak.

Rotork's ELB achieves this by monitoring changes in pipeline pressure. However, pipeline pressure can fluctuate depending on pipeline size, rate of flow, the size of the break or gas pressure. Instead of taking a one-off reading which could well be skewed by these factors, an ELB constantly compares rate of pressure drop (RoD) or rate of pressure rise (RoR) readings against pre-determined limits set by the operator. If the reading exceeds or falls below the set levels a microcontroller energises a solenoid valve which allows pipeline gas in the actuator's circuit manifold to move the valve to the closed position and cut off the affected part of pipeline.

The ELB features configurable programmable alarm and alert settings. If an alert is triggered by the ELB detecting an excessive RoD or RoR reading, an alarm can be set to trip (with a delay of between 0-1,800 seconds) if the pipeline pressure condition remains for a set time. These alarms can be configured to command the valve to carry out actions including open, close, de-energise all solenoid valves and open or close inhibit, a setting used to halt or delay an actuator's response to prevent unwanted operation.

Image Credit : Rotork

The ELB isolates breaks by constantly measuring rate of pressure drop or rise readings in a pipeline and commanding a valve to travel to a set position if the readings exceed limits set by the operator.

The minimum and maximum RoD and RoR limits can be adjusted to between 0.2 to 20 bar/min. Data is also stored in the ELB which can be used for asset management and predictive maintenance to optimise pipeline performance.

> "When used in conjunction with other equipment it can help to reduce damage to equipment and the environment."

With many of these pipelines running for miles through remote locations with no access to mains electricity supplies, alternative ways of powering ELB devices are often required. The ELB can operate with minimal power, meaning compact solar panels with a rechargeable battery pack are more than adequate for operation.

The ELB is normally combined with a Rotork Gas-over-Oil (GO) actuator. A Rotork GO actuator is designed to use pipeline gas as the motive power source. The gas is delivered to oil tanks which convert the gas into hydraulic pressure to drive the scotch yoke quarter-turn or linear actuators. Using pressurised oil as the driving fluid provides powerful and smooth actuator control and isolates the cylinder from pipeline gas. This prevents contaminants from entering the hydraulic cylinder, eliminating corrosion and seal deterioration, and extending actuator life. The compact, modular gas control manifolds employ poppet-style control valves – a reliable design trusted throughout the industry – and are available in fail-safe versions.

Using an ELB detection system to quickly command actuators to travel to a configured emergency position is a reliable alternative to traditional pneumo-mechanical systems. The technology can act quickly in the event of a pipeline break to isolate the appropriate pipeline section and reduce potentially damaging financial and environmental impacts. ■

Operating in volatile conditions is oftentimes common in the oil and gas industry. Sullivan-Palatek products are equipped with robust factory-made air ends and oversized coolers, surrounded by powder-coated galvanneal enclosures supported by galvanized railings, 4-point lifts, and skids for ultimate protection.These units are available from 185-1600 CFM, and up 500 psi.

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New valve technology attracts Middle East interest

AN INNOVATIVE FLOW control valve technology from UK-based pressure control equipment manufacturer Oxford Flow is set to be rolled out in the Middle East. The company has signed a distribution agreement with Dubai-based turnkey solutions and contract services company, GCG Engineering Services.

Oxford Flow has developed a multiphase oil and gas valve which is internally activated with no "stem" or mechanical actuator, bringing significant advantages, as Neil Poxon, Oxford Flow's CEO explained in an interview with *Oil Review Middle East*.

"Traditional oil and gas valves, even with the latest innovations, have a stem, and they are mechanically actuated," he said. "A typical ball valve will have a stem or mechanical actuator sitting above the valve which twists the valve open or closed, and that mechanical actuator is bigger than the valve itself. If you ask an operator what the biggest issue they have with their flow control valves, they would tell you that it is mechanical actuator failure and fugitive emissions. There are many things that can go wrong with that actuator. Furthermore, you're transversing from vertical to linear motion to actuate the valves, which is troublesome and unreliable."

Oxford Flow's valve has no stem or external pipework, said Poxon, being internally and hydraulically actuated, with no external components. "It is the first valve ever to completely eliminate the stem, the mechanical actuator and all the reliability, failure and fugitive emissions associated with that," he maintained. "Our valve offers significant operational and reliability advantages over traditional oil and gas valves. With minimal moving parts, it requires little maintenance – reducing asset downtime and costs." The valve technology is 80 per cent lighter than incumbent valves, and it is applicable to almost any mass-flow rate of pressure, for example, from breathing apparatus to deepwater oil exploration. It can be retro-fitted into existing pipework without plant modifications.

"The GCC states are a hive of activity at the moment, particularly in the oil and gas sector. We already have a number of field trials for our oil and gas valve ongoing with major NOCs," said Poxon.

Image credit: Oxford Flow

Neil Poxon, CEO, Oxford Flow

As well as its multiphase oil and gas valve, the latest addition to its portfolio, Oxford Flow has developed valves for water and gas systems, based on the same core technology – and Middle East operators are interested in trialling all three, Poxon revealed.

"Oil and gas operations involve water systems and gas systems as well as multiphase gas flow. Oil and gas companies want to trial our full product range because they have water issues as well, whether it is produced water, water injection etc. There is also a requirement for gas valves, for feed gas, gas blanketing, instrumentation, etc."

Oxford Flow's technology was designed and tested at the Osney Thermofluids Institute research facility at Oxford University.

In March, the company appointed Aberdeen-based energy investment specialists Simmons Energy to raise strategic capital for its ambitious growth objectives across the oil and gas sector and accelerate the deployment of its technologies into multiple energy and industrial markets. This will enable investors to deploy the technology quickly and tailor it to their specific needs, Poxon said.

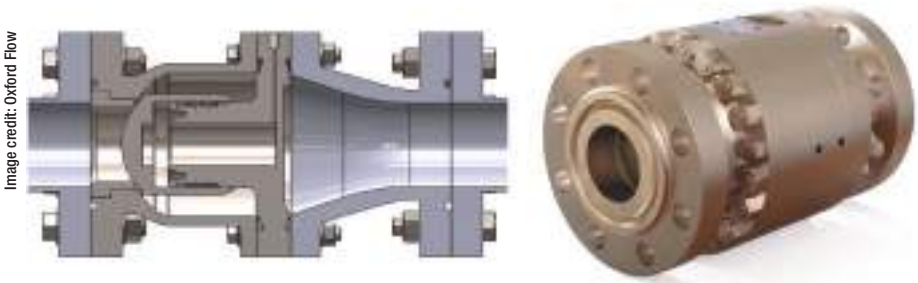

Image credit: Oxford Flow

The multiphase axial flow control valve eliminates the stem, diaphragm and external mechnical actuator, minimising potential leak paths and the risk of fugitive emissions.

Middle East & Africa forecast to be largest valve remote control system market

THE MIDDLE EAST and Africa is expected to account for the largest share of the valve remote control system market from 2018 - 2023, according to *Valve Remote Control System Market - Global Forecast to 2023,* published by MarketsandMarkets.

Major factors are the high demand for electricity due to large populations, and increased investment in the offshore and marine industry by countries such as Saudi Arabia, UAE, and Oman. Saudi Arabia accounted for the largest share of the Middle East and Africa valve remote control system market in 2017 and is estimated to have the highest production capacity during the forecast period.

Image credit: roongzaa/Adobe Stock

Butterfly valves are widely used in sectors including oil, gas and petrochemicals.

The global valve remote control system market is projected to grow at a CAGR of 4.73 per cent from 2018 to 2023, according to the report, reaching US$8.0bn by 2023 from an estimated US$6.4bn in 2018. This growth is primarily due to the increased demand for automation and predictive maintenance from manufacturing industries, and an increased need for industrial valves from the oil and gas industry.

The butterfly valve segment is expected to grow at the highest CAGR from 2018 to 2023, primarily driven by the rapid improvement in the power, oil and gas, and chemical sectors. The equipment is mainly used by the core sector, power generation, offshore, chemical, petrochemical, and marine industries where it is used in various kinds of piping systems. Factors such as an increase in industrialisation and urbanisation and the need for enhanced oil recovery are expected to drive the butterfly valve market.

Auto-remote offshore operations: riding the next wave

Experts from DNV GL discuss the developments, ambitions and challenges behind shifting more offshore operations to remote, automated and autonomous operations.

INCREASED AUTOMATION, WHETHER in the form of decision support, remote operation or autonomy, has the potential to improve the safety, efficiency and environmental performance of shipping and offshore operations.

In order to reap the full potential of remote operations, the offshore industry needs a robust set of standards that enables new systems to reach the market and ensure that these technologies are safely implemented.

"DNV GL issued a class guideline for 'Autonomous and Remotely Operated Ships' in September of 2018," reports Are Jørgensen, DNV GL's project manager for the guidelines. "We want to help build a safety culture around new technologies for autonomous and remotely operated ships. A lot of this knowledge can be applied to offshore operations, but not everything. In shipping, we have divided ship functions into engineering and navigational systems. We believe that categories need to be derived for offshore too, such as supply and installations, in order to reflect how much effort is needed to achieve safe, autonomous operations in which areas."

Reasons to automate: the big three

There are three principal reasons to automate, Jørgensen relates, none of them having to do with automation as such. "The first is the business case, whether it can help the operator to earn more money. Operating expenditure (OPEX) is still the main benefit of automated and remote operations," he says, due to reduced crew costs. But he points out that capital expenditure (CAPEX) can also be reduced in some cases, as fewer people present to perform operations means fewer systems are needed to accommodate and protect workers.

The next reason is safety, provided that the technology helps keep the crew safer by allowing them to work from a remote environment like a control room on land, rather than on the deck of a platform or a ship. Automated control and alarm systems can also contribute to reducing the risk of accidents.

Ship Intelligence will make greater use of ship systems and sensors to enhance both crew and vessel operating efficiency.

Image Credit : Rolls-Royce

> "OPEX is still the main benefit of automated and remote operations."

The third is protecting the environment. "Environmental gains from reduced emissions are easy to identify in logistical operations, like platform supply, but perhaps not so easy to track in platform operation. The main benefit of automation might be in reducing the risk of spills."

Overall, Jørgensen says, the big benefit of automation and remote control is allowing one person to do more. "Not just one operator on one well operation or one captain on one ship, but one person responsible for supervising and performing many tasks."

Software at the core

Per Arild Åland, business development manager Offshore Class at DNV GL, raises the issue of increasing complexity in software-based control systems in the maritime and offshore industry. "Our way of addressing software performance today does not entirely match the complexity of future systems that are under development, and we have to remember that this trend toward complexity will accelerate as we go forward."

In response, DNV GL is now introducing a scheme where software integrity is separately verified as a part of the regular control system certification. This includes a selection of important systems being installed on board DNV GL-classed vessels and offshore units, including drilling equipment, pipeline and cable-laying systems, walk-to-work gangways and offshore cranes.

"The work we have been doing to prepare for more software-intensive verification of central systems is an important element in preparing for more remote and autonomous operations of offshore functions," Åland explains. "Simulation-based software testing is a cost-efficient approach to verify integrity and performance according to DNV GL's rules and standards. It is being prepared and tested in close cooperation with marine and offshore vendors."

How software simulation testing works

"Instead of using a physical asset, we create a virtual system in a simulator," Åland explains. "It's more of a digital cousin than a digital twin because we can limit the scope to include models of the sensors, actuators and physical equipment that are a part of the control system loop."

Using virtual, simulator-based testing platforms allows for quick testing, without risk to personnel, assets or the environment. "We can also test earlier in the development process and incorporate more resources, without geographical restrictions," Åland adds.

DNV GL has integrated its methodology into regular control system certification schemes, enhancing their ability to address and evaluate how well software contributes to the total control and safety system performance. "Testing can also be hooked up to the design development process. We can use the manufacturer's simulator for testing and apply results in the control system certification. This means that the manufacturer does not need to do much extra work to have their systems tested in a virtual environment."

Together in the cloud

Åland reports that they have tuned the qualification process to make it more industrialised and add value for the end user in the supply chain. "When an owner orders a machine, the software performance has also been separately verified according to safety performance. In addition to improving operational efficiency, this is very cost- and time-effective."

The next step, he says, is cloud-based testing. "We can emulate the control system and upload it to the cloud, test planned improvements and include them in a simulation platform. Together with SINTEF and several others, we are currently involved in a joint industry project (JIP) on co-simulation of standardised models on an open-source simulation platform."

Per Arild Åland characterises DNV GL's standards as an industrial meeting place, forming a basis for trust in the supply chain, with software integrity being verified in the process.

"Safety systems and others critical to automated and remote operations, and to future autonomy, are software-driven. We have entire grids of complex systems and machines with software as the glue holding them together. If we are going to make real progress toward autonomy, there needs to be a common sense of urgency in the industry to pursue a more comprehensive verification of software-intensive systems." ■

For further information contact Per Arild Åland, business development manager Offshore Class, DNV GL. Tel: +47 97 58 48 30. Email: per.arild.aland@dnvgl.com. This article is reproduced with kind permission of DNV GL.

Recent examples of advances in auto-remote technology

- iSURVEY recently completed what was reported to be the first-ever remote drilling rig positioning project.
- Equinor has converted its Valemon platform to remote control from land, as well as opening a new fully automatic, unmanned and remote platform on the Oseberg field in 2018. It has also opened two onshore centers: one for centralised support of integrated operations and one for drilling operations.
- Oceaneering has launched a new battery-powered ROV capable of operating for extended periods of time without having to be recovered to the surface. It also employs machine vision learning and augmented reality technologies.

Is AI the key to growth for energy companies?

Energy companies are increasingly investing in artificial intelligence (AI) to provide answers to many of the critical questions they face, says Manav Garg, CEO & founder of Eka Software Solutions.

AI IS ALREADY having a significant impact on many aspects of human life. Amazon's Alexa and Google Assistant are using the power of cloud computing, big data processing, and AI to interact with millions of people every day – answering questions, providing directions, and controlling home appliances, lighting and air conditioning. Self-driving cars, in large part controlled by AI, have taken to the roads. In these consumer markets, the impacts and influences of AI continue to rapidly emerge and evolve.

In commercial and industrial markets, AI is just at the cusp of influencing the way industries operate, and how commodities are produced, traded, moved and transformed. As commodity production and processing machines are increasingly connected to the Cloud, the potential for AI to improve operating efficiencies of these assets has drawn attention and investment from almost all corners of the market.

AI advances in energy markets

With the growing proliferation of data from internet of things (IoT) sensors, and the seemingly unlimited processing power of the cloud, energy companies have the opportunity to leverage expanding oceans of data to improve operations. Oil and gas producers are increasingly leveraging data to better identify exploration opportunities and optimise production to ensure the greatest possible recovery of their resources. With the advent of new AI technology, including machine learning, producers are looking to AI to improve their ability to optimally locate wellsites, model well designs and reduce drilling time and costs.

Image Credit : wladimir1804/Adobe Stock

Producers are looking to AI to improve their ability to optimally locate wellsites, model well designs and reduce drilling time and costs.

- ExxonMobil is using robots with the ability to learn from their own mistakes and make logical corrections to detect and analyse hydrocarbons on the ocean floor.
- NVIDIA and Baker Hughes, a GE company, have partnered to use AI and GPU-accelerated computing to help the oil and gas industry leverage AI across the value chain, noting that "from seismic modeling and automated well planning to predicting machinery failure and optimising supply chains, deep learning neural networks can unlock insights from data that were previously as hidden as the oil underground."
- AI technologies such as natural language processing can extract data from unstructured or semi-structured daily inspection and maintenance reports at oil fields. These systems process the data quickly and efficiently, providing greater visibility into problems and rapid problem solving – increasing safety for everyone.
- Shell is trialling AI applications across its entire supply chain, including testing reinforcement learning – a form of "semi-supervised" machine learning, to control its drilling equipment.
- Total and Google are collaborating to develop AI systems that can help geologists at Total interpret subsurface images from seismic studies faster using computer vision. The goal is to develop software that could analyse the image files, correlate the findings with information extracted from technical documents and summarise this information into a queryable AI assistant that can answer questions on the subsurface data in natural language. Total claims to have applied machine learning to other exploration and production activities, including predictive maintenance for turbines, pumps, and compressors at its industrial facilities; production profile forecasting; automated analysis of satellite images; and analysis of rock sample images.

Investment continues

Perhaps the best indicator of increasing interest in – and future market impacts of – AI technologies is the growing investment in AI around the world. According to IDC, worldwide spending on artificial intelligence systems is forecast to reach US$35.8bn in 2019, an increase of 44 per cent over the amount spent in 2018. A Markets and Markets report estimates the value of AI in the oil and gas industry will reach US$2.85bn by 2022, growing at a compound annual growth rate of 12.66 per cent.

Given the scale of interest and investment in AI technologies, it is a near certainty that AI will have profound impacts on the energy markets. It is only really a question how soon, and just how much influence or control over the operational energy infrastructure, and commercial markets, we are willing to cede to these new thinking machines. ■

Eka's ETRM solution gives energy companies greater control over trading, risk, and the energy supply chain. www.eka-plus.com.

GOFSCO underlines importance of HSE innovation and excellence

GAS & OIL FIELD Services Company (GOFSCO), one of the largest integrated service providers in Kuwait specialising in the upstream and downstream oil and gas sector, both onshore and offshore, sponsored and participated at the 3rd Kuwait International Health, Safety, Security & Environment Conference & Exhibition (KIHSSE), held at the Jumeirah Beach Hotel & Spa, Kuwait from 18-20 February 2019.

The exhibition was held under the patronage of H.E. Dr. Khaled Al-Fadhel, Minister of Oil & Minister of Electricity & Water, State of Kuwait, and is considered one of the world's most prominent events in the HSE arena. The event, which was under the theme of 'Transforming HSE culture for a resilient future', gathered influential oil and gas and HSE experts to share their wealth of knowledge and exchange ideas for a brighter more sustainable future for the energy sector.

During the opening ceremony, Eng. Hussam Ali Marafie, chairman and CEO at GOFSCO, participated in the plenary session leadership panel which had as its theme 'Leadership Role in Transforming HSE Culture'. Eng. Marafie highlighted his involvement from a managerial perspective and the approach adopted to ensure the sustainability of a positive and proactive HSE culture within GOFSCO, while addressing several challenges which were dealt with to achieve HSE excellence across all practices.

Image Credit : GOFSCO

The GOFSCO stand featuring the Oilfield Solar Pump.

Eng. Marafie said, "We are pleased with our participation in this renowned event as we share the objectives behind this platform. At GOFSCO, we pride ourselves in being among the upper echelons of the oil and gas services companies, in pioneering for a safer, cleaner and secure future. With HSE continuously being integrated into our business cultural norms, we are able to further enhance our methods of conducting business for our partners, employees, environment, and the society as a whole, while maintaining our commitment to HSE standards."

GOFSCO's participation at the exhibition featured the Oilfield Solar Pump, which has been designed to help reduce the ecological environmental footprint effects by reducing CO2 emissions for a healthier environment. GOFSCO's booth also aimed at introducing visitors to the QHSSECare system, which is currently being used by GOFSCO. The system is designed to share intensive training courses regarding HSE standards and the measures required to be taken by employees towards maintaining a healthy, safe and secure work environment.

Addressing the challenges of the evolving insurance market

"AS PART OF ambitious plans backed by progressive governments, the region's pipeline of development projects continue to grow," says Vidyanand Singh, head of engineering at Oman Insurance.

"Massive projects are underway in nearly every sector from oil & gas to hospitality, retail and construction, geared towards strategic initiatives such as Dubai Expo 2020. These mega projects bring with them strong growth opportunities for every sector within the economy, and typically new and complex risk. It is the efficient management of such risk that showcases the strength of the region's insurance sector."

"There are a number of challenges that projects face. A slowing economy, pockets of political instability, a dearth of professional skills and material shortage are just some of the issues to be addressed. Add to that the associated technological advancements and you have totally unfamiliar risk for the industry to grapple with. New risk without any history, not only in the region, but across the globe. But that is what the region has consistently delivered over the past decade – from the innovation driving the construction of the hyperloop, to solutions supporting renewable energy."

"The insurance industry has worked with the safety and security industry to identify and manage risk associated with such novel developments. Added to that is the focus on environment sustainability, even as innovation is constantly nurtured and endorsed."

"What does the risk manager within the oil and gas industry need to look out for in these circumstances? Most firms have invested in skilled in-house risk managers who work closely with project level managers to identify, analyse and assess new risk, allocate resources to risk management and monitor, report and control incidents."

Image Credit: Oman Insurance

Vidyanand Singh, head of engineering, Oman Insurance.

"Emerging risk is increasingly posing a large challenge for risk managers across every industry. Natural catastrophes for example, are changing exposure globally, but while most other regions have the expertise and experience to manage incidents, the same preparedness is only just coming together in the Middle East. In this region, for instance, flooding has not historically been a challenge, but with the changing scenario, planning, design and structure engineers now need to consider such unforeseen natural perils as well."

"Diligence in following routine safety guidelines critically reduces incidents and limits exposures, but astute risk transfer solutions are critical to business continuity. Engaging insurers with a long history and sound risk management experience of sector specific risk is key. It brings forward the right expertise necessary for identifying, evaluating, controlling and transferring complex risk."

Sercel introduces DAS seismic solution

SERCEL HAS LAUNCHED its first distributed acoustic sensing (DAS) seismic solution – SigmaWave. Designed in partnership with Fotech Solutions, SigmaWave is the first integrated distributed acoustic solution designed exclusively for borehole seismic applications and reinforces Sercel's advanced range of downhole seismic acquisition systems.


Image credit: Sercel

SigmaWave, Sercel's first distributed acoustic sensing (DAS) seismic solution.

SigmaWave is fully integrated with Sercel's existing downhole seismic tools and enables continuous, real-time seismic measurements along the entire length of a fibre optic cable. Whether by retrievable or permanent deployment, it is now possible to visualise and monitor the well in real time and instantly generate SEG-Y files. With unique features such as user-selectable gauge length, acquiring the highest quality seismic data, without compromise, is now possible.

Pascal Rouiller, Sercel CEO, said, "Our launch of the SigmaWave integrated DAS solution offers the borehole industry a complete seismic acquisition system that is robust and provides accurate data in a ready-to-use format, for a wide range of applications and at an accessible cost. It will enable our clients to improve the description of their reservoirs to enhance recovery."

Hempel introduces water-repellent coating

HEMPEL IS ROLLING out a highly flexible two-coat water repellent coating – Hempatop Repel 800. This new topcoat offers enhanced corrosion protection by actively repelling water from the coated surface. For optimum protection, Hempatop Repel 800 is used in combination with Hempel's patented Avantguard technology activated zinc primer – Avantguard 770. The first volumetric water repellent topcoat on the market, Hempatop Repel 800 (used with Avantguard as the first coat) delivers improved flexibility and crack resistance, increased adhesion retention and minimises corrosion.

This two-coat system requires one coat less than standard protective coatings solutions for offshore installations and lasts significantly longer, reducing costs for owners. Oriol Osso, head of energy, group product management, Hempel, commented, "Traditional three-coat systems used for offshore structures regularly show signs of early coating failure. This is primarily due to water ingress through the coating system, stress induced micro-cracking and/or mechanical damage. Our Hempatop Repel 800, used in combination with Avantguard 770, simplifies the process and addresses all these challenges."

Weatherford launches deepwater completion system

WEATHERFORD INTERNATIONAL HAS launched the world's first remote-activated, single-trip deepwater completion system. By combining the upper and lower completions in one trip, the system has been shown to reduce installation time between 40 and 60 per cent and to reduce rig time by four to six days.

Using radio-frequency identification (RFID) technology, the field-proven TR1P system delivers 100 per cent interventionless operation in both producer and injector wells.

"Weatherford's TR1P advanced deployment system has set a new industry benchmark for completion installations, especially in deepwater environments," said Mark Hopmann, president, Completions for Weatherford. "The ability to perform multiple operations in less time with less equipment and fewer personnel is a game-changing deepwater solution, and the answer to our customers challenge to significantly increase efficiencies when installing deepwater completion systems. TR1P gives you the ability to perform the operations demanded by your reservoir, rather than your budget."

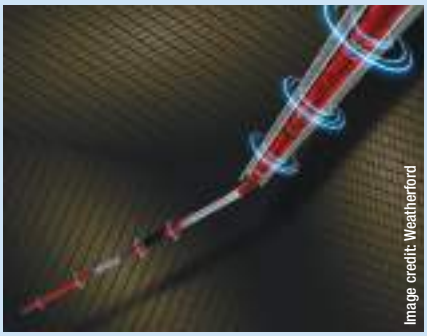
Image credit: Weatherford

TR1P system delivers 100 percent interventionless operation in both producer and injector wells.

The technology has been named a Spotlight on New Technology Award winner by the Offshore Technology Conference (OTC) to be held in Houston from 6-9 May.

Collaboration on subsurface imaging technologies

EMERSON AND REPSOL have established a strategic alliance to deliver advanced subsurface geophysical technologies to significantly reduce the time to prospect and produce first oil.

Emerson will work collaboratively with Repsol to implement and deploy advanced subsurface imaging technologies, with core technologies developed by Repsol as part of Kaleidoscope, its 10-year innovation project. The solution combines the latest in high-end visualization, high-performance computing and cloud delivery.

These technologies have contributed to the exploration success ratio of Repsol, with special significance in settings of complex geology in countries like Brazil, Peru and Bolivia.


Image credit: Emerson

The solution combines the latest in high-end visualization, high-performance computing and cloud delivery.

"Emerson is helping the energy industry implement the latest digital technologies to realise significant performance improvements," said Lal Karsanbhai, executive president of Emerson's Automation Solutions business. "We're proud of our collaboration, to help Repsol bring this subsurface reservoir imaging innovation to the geoscience community. It is a great example of how technology and collaboration can deliver business value for the oil and gas industry."

The partnership, which includes a joint investment of both research and development, will enable Repsol and Emerson to produce commercially available software products for license to help other oil field operators and service companies.

The first phase of the collaboration will provide advanced solutions for velocity determination, including full waveform inversion and advanced solutions for seismic imaging developed in the Repsol Technology Lab. In addition, the collaboration can be extended to a broader range of Repsol subsurface technologies.

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Saudi Aramco spices up seismic data acquisition

SAUDI ARAMCO SHOWCASED the 'SpiceRack', its fully automated seabed seismic data acquisition system, at the Middle East Oil Show (MEOS) in Bahrain. Based on the deployment of self-propelled AUV nodes equipped with 4C sensors, it is revolutionising the acquisition of seismic data, according to a Saudi Aramco representative, opening a new era in introducing automation in the seismic value chain.

Conventional shallow and deep seabed seismic acquisition provides the high quality data required for imaging complex targets, but is costly and slow. The SpiceRack acquires data 60 per cent faster than conventional seismic acquisition methods and reduces costs by 30 per cent, according to Saudi Aramco. It also results in improved data quality and resolution because of the ability to maximise the contact of the nodes with the seabed. The more effective the seabottom coupling, the better the data quality. The SpiceRack has 70 days battery life, compared with 40 days in competitor applications, and is robust and agile, with the ability to work in obstructed areas, define complex reservoirs and resolve thin sand stringers.

Saudi Aramco will be piloting the SpiceRack in the Red Sea.

The SpiceRack has been successfully piloted in the Zuluf field in the shallow waters of the Arabian Gulf, where the geology is relatively friendly. Saudi Aramco is now looking to perform a pilot using 200 of the AUVs in the more challenging deep water environment of the Red Sea, where the seabed is rockier and relatively unexplored. Saudi Arabia reported in March that it had discovered large quantities of gas in the Red Sea and is looking to intensify exploration over the next two years.

The SpiceRack has been patented and developed to Aramco specifications and needs through a collaboration between Saudi Aramco's EXPEC Advanced Research Center (EXPEC ARC), Seabed Geosolutions and partners from the robotics industry and academia. This collaborative approach enables Saudi Aramco to be at the heart of the research and to shape the way the industry goes forward, said the Saudi Aramco representative.

Ziyen launches oil and energy cryptocurrency

SCOTTISH-AMERICAN COMPANY ZIYEN Inc has announced the launch of a digital currency that aims to revolutionise the global oil and energy market.

Based on blockchain technology, ZiyenCoin is the first energy-focused security token offering (STO) to be filed under the USA Securities and Exchange Commission (SEC) regulations.

ZiyenCoin is a fully-trackable digital currency operating with blockchain supply chain management to offer unrestricted worldwide movement, aiming to remove market uncertainties and cut transaction costs by around three to five per cent annually across the US$5 trillion global energy sector.

While blockchain technology first came to prominence as a transactional platform for cryptocurrencies, such as Bitcoin, industries including healthcare, banking and insurance are increasingly adopting a decentralised ledger which would remove transactional fees, essentially saving tens of billions of dollars for each respective sector.

ZiyenCoin aims to become the world's most widely adopted blockchain-enabled cryptocurrency. As a regulated and legally-compliant STO – unlike Bitcoin – it will be benchmarked against energy as a commodity along with the certainty and favourable treatment afforded by the SEC.

Alastair Caithness, CEO at Ziyen, said, "Major global industries are increasingly adopting blockchain technology, as evidenced by banking giant JP Morgan Chase recently launching its own cryptocurrency.

"Along with automation and digitalisation, blockchain technology has the potential to be a game-changer for the energy industry to ensure the longevity of many mature basins. This latest division will help establish Ziyen as one of the leading technology companies in the oil and energy industry."

Ziyen's strategy is to acquire numerous leases, return wells to production and pursue other promising oil leases in the USA through its dedicated Ziyen Energy division. Meanwhile, its Ziyen Advantage programme offers a more sustainable means of oil production in which proprietary technology will be used to reduce costs.

Alastair Caithness, CEO, Ziyen.

Image Credit: Ziyen

Crowcon launches its Xgard Bright addressable fixed-point gas detector with display

CROWCON HAS DEVELOPED an addressable fixed-point gas detector with local display which offers both flammable and toxic gas detection and oxygen monitoring.

Crowcon's Louise Early explains, "We originally developed the Xgard Bright specifically for China four years ago and due to its success, particularly in regard to its addressable functionality, we have now released Xgard Bright internationally."

Lowering the cost of installation, the three-wire addressable implementation reduces cabling requirements. The large OLED display allows users to work with Xgard Bright during install, calibration and routine maintenance without the need to open the housing.

The Xgard Bright gas detector.

Image Credit: Crowcon

Xgard Bright offers analogue 4-20mA and RS-485 Modbus signals as standard, along with an alarm and fault relay and optional HART communications. It is suited to both small and large installations using point-to-point or multi-drop methodologies. Target applications include oxygen depletion in laboratories (educational, medical and research), toxic and flammable gas monitoring across the automotive, steel, chemical, food and beverage industries.

Early concludes, "We have already achieved significant success with Xgard Bright in China, across the waste water, gas distribution and construction industry and as a result, took the decision to extend our regional certifications, widening the suitability of this successful addressable gas detection solution."

Aker Solutions and FSubsea to boost subsea oil recovery

AKER SOLUTIONS AND FSubsea have agreed to create FASTSubsea to help operators increase oil recovery in a simpler and more environmentally friendly way.

Multiphase subsea pumping technology has the potential to increase oil recovery rates by more than 20 per cent, but cost, space limitations and sometimes complex solutions mean multiphase pumps are installed in fewer than 30 of the world's more than 1,500 offshore fields.

With FASTSubsea, this is about to change. The new company combines Aker Solutions' high-performance multiphase hydraulic technology with FSubsea's innovative Hydromag technology to create the world's first 'topside-less' multiphase boosting system.

The pump-module solution being developed by FASTSubsea can cut capex by half and enable subsea boosting at fields where there is no available topside space. Getting more out of existing wells reduces CO_2 emissions per barrel.

"Creating FASTSubsea enables us to increase our speed to the market, reduce risk and reduce investment in multiphase test facilities," said Alexander Fuglesang, CEO of FSubsea.

"Combining Aker Solutions' subsea systems expertise and multiphase test facility with FSubsea's Hydromag technology and lean mindset will benefit both companies," said John Macleod, chief technology officer at Aker Solutions.

Project Databank

Compiled by Data Media Systems

MULTI-BILLION DOLLAR PROJECTS, SAUDI ARABIA

Project	City	Facility	Budget (US$)	Status
Aramco - Berri - Gas-Oil Separation Plant Expansion	Berri	GOSP	1,700,000,000	EPC ITB
Maaden - Sabic - Mosaic - Waad Al Shamaal Phosphate City (Overview)	Ras Al Khair	Phosphate	9,600,000,000	Commissioning
Maaden - Sabic - Mosaic - Waad Al Shamaal Phosphate City - Sulphuric Acid Plant & Power Plant (Package 4)	Ras Al Khair	Sulphuric Acid	1,500,000,000	Commissioning
Pan Asia - Jizan City for Basic & Downstream Industries - Purified Terephthalic Acid (PTA) Plant	Jizan	Petrochemical Plant	3,800,000,000	EPC ITB
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 (Overview)	Rabigh	Aromatics	5,000,000,000	Construction
SABIC - ARAMCO - Yanbu - Crude Oil To Chemicals (COTC) Complex	Yanbu	Petrochemical Complex	20,000,000,000	FEED
Saudi Aramco - Arabiyah and Hasbah Gas Field Development	Arabiyah	Gas Field	3,000,000,000	Construction
Saudi Aramco - Fadhili Gas Plant (Overview)	Eastern Region	Gas Treatment Plant	6,600,000,000	Construction
Saudi Aramco - Fadhili Gas Plant - Main Processing Facilities (Package 1)	Eastern Region	Gas Treatment Plant	2,500,000,000	Construction
Saudi Aramco - Fadhili Gas Plant - Offsites & Utilities (Package 3)	Eastern Region	Gas Field	2,000,000,000	Construction
Saudi Aramco - Fadhili Gas Plant - Sulphur Recovery Unit SRU (Package 2)	Eastern Region	Gas Treatment Plant	2,500,000,000	Construction
Saudi Aramco - Haradh Gas Increment Program (Overview)	Haradh	Gas Compression	1,200,000,000	Construction
Saudi Aramco - Haradh Gas Increment Program - North Haradh Field Gas Compression Facilities	Haradh	Gas Compression	1,200,000,000	Construction
Saudi Aramco - Haradh Gas Increment Program - South Haradh Field Gas Compression Facilities	Haradh	Flowlines	1,200,000,000	Construction
Saudi Aramco - Haradh Gas Increment Program - Satellite Gas Compression Facilities	Haradh	Gas Compression	1,200,000,000	Construction
Saudi Aramco - Hasbah Field Increment II	Hasbah	Gas Field	1,600,000,000	Construction
Saudi Aramco - Hawiyah Gas Plant Expansion	Hawiyah	Gas Processing	1,200,000,000	Construction
Saudi Aramco - Jizan Export Refinery (Overview)	Jizan	Petroleum Oil Refinery	2,100,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Naphtha Processing and Aromatics Complex	Jizan	Hydrotreating	1,040,000,000	Commissioning
Saudi Aramco - Jizan Export Refinery - Tank Farms	Jizan	Oil Storage Tanks	1,500,000,000	Construction
Saudi Aramco - Khurais Arabian Light Crude Increment Program	Eastern Region	Oil & Gas Field	3,000,000,000	Construction
Saudi Aramco - King Salman Energy Park (SPARK)	Abqaiq	City	4,400,000,000	Design
Saudi Aramco - Liquefied Natural Gas (LNG) Receiving Terminal	Jeddah	Liquefied Natural Gas (LNG)	1,000,000,000	Feasibility Study
Saudi Aramco - Marjan - Gas Oil Separation Plant (GOSP)	Marjan	GOSP	5,000,000,000	Engineering & Procurement
Saudi Aramco - Marjan - Oil Field Expansion (Overview)	Marjan	GOSP	15,000,000,000	Construction
Saudi Aramco - Marjan Water Injection	Marjan	Water Injection	5,000,000,000	Engineering & Procurement
Saudi Aramco - Marjan, Berri, Zuluf and Safaniyah IV Expansion - (Overview)	Various	Oil & Gas Field	7,000,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) (Overview)	Various	Natural Gas Liquefaction (NGL)	4,050,000,000	Construction
Saudi Aramco - Offshore Maintain Potential Programme (MPP)	Various	Oil & Gas Field	7,000,000,000	Construction
Saudi Aramco - Ras Al Khair - Rig Manufacturing	Ras Al Khair	Rigs	2,000,000,000	Project Announced
Saudi Aramco - Ras Tanura Refinery - Clean Fuels Project	Ras Tanura	Aromatics	2,000,000,000	Construction
Saudi Aramco - Safaniyah Expansion	Safaniyah	Offshore Platform	1,427,000,000	Construction
Saudi Aramco - Tanjib Gas Processing Plant - Marjan Increment	Eastern Region	Gas Processing	1,500,000,000	EPC ITB
Saudi Aramco - Total - Satorp - Jubail - The Amiral Complex	Jubail	Petrochemical Plant	9,000,000,000	FEED
Saudi Aramco - Unconventional Gas Program - Shale Gas Production	Various	Shale Gas	7,000,000,000	EPC ITB
Saudi Aramco - Unconventional Gas Program - Tight Gas Production Systems A and B (Overview)	Turaif	Gas Field Development	3,500,000,000	Construction
Saudi Aramco - Zuluf Oilfield Expansion	Zuluf	Oil Processing Facility	1,700,000,000	Engineering & Procurement

Project Focus

Compiled by Data Media Systems

Project Summary

Project Name	Saudi Aramco - Haradh Gas Increment Program (Overview)
Name of Client	SAUDI ARAMCO - Saudi Arabian Oil Company
Estimated Budget (US$)	1,200,000,000
Revised Budget (US$)	2,400,000,000
Facility Type	Gas Compression
Status	Construction
Project Start	Q1-2014
End Date	Q2-2021
FEED	WorleyParsons
Main Contractors	Tecnicas Reunidas, Saipem, China Petroleum Pipeline Engineering Company - CPPE, Tekfen
Contract Value (US$)	2,029,000,000
Award Date	Q4-2017

Background

Saudi Arabia plans to raise its gas production to be able to diversify its energy mix and satisfy demand due to ongoing expansions in the petrochemicals and power industries. In an initiative to meet growing domestic needs, Aramco plans to boost the production of Haradh by building gas compression plants and other facilities. An expansion will take place in Hawiyah plant as well to raise the capacity by 1.3bn standard cubic feet per day. Hawiyah and Haradh are part of Ghawar, the world's largest onshore oilfield.

Project Status

Date	Status
Mar 2019	The North and South field gas compression facilities are currently under construction.
Feb 2019	The work under HUG-2 package by ENPPI is ongoing. The design and construction progress stands at 94 per cent and 1.6 per cent respectively. It is scheduled to be completed in 2020.
05 Sep 2018	Saudi Aramco reveals that latest contracts awarded to CPPE, Saipem & Tekfen have concluded the required permanent infrastructure to operate the nine new gas compression plants, which make up the core of the Southern Area Energy Efficiency Program.

Project Scope

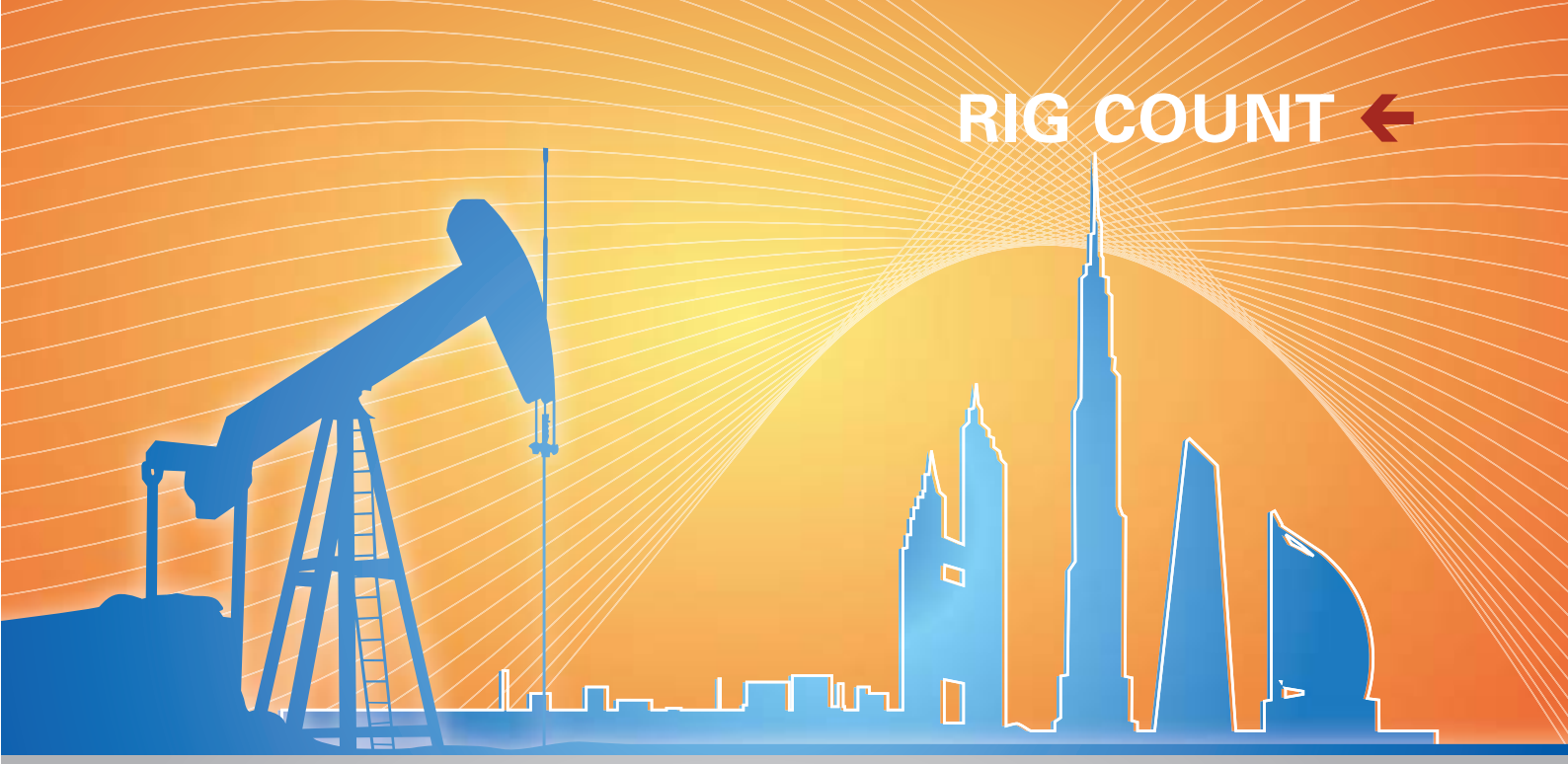
The proposed facilities will have the capacity to process more than 1 billion cubic feet a day (cf/d) of additional gas produced from the Ghawar onshore field and will entail:

- Building gas compression plants and other facilities to boost production from Haradh.
- Increasing the flow rate by reducing pressure at the wellheads.
- Installing gas compression systems to boost the pressure and transfer the gas to the processing plants.
- Communication and network infrastructures will be set up to improve gas production and sustainability. SCADA-RTU Systems and backbone connection to support the operation of the nine new Gas Compression Plants (GCPs), seven Liquid Separation Stations (LSSs) and three Operational Support and Administration Areas

Haradh and Hawiyah are part of Aramco's Southern Area Energy Efficiency Program, which includes the development of nine gas compression plants and associated infrastructure to improve the reservoir recovery rate and extend the production plateau of both gas fields by reducing the wellhead pressure.

- Recent contract awards targeted the below scopes:
- The Southern Pipelines Package: Saipem
- The Satellite Pipelines Package: Tekfen
- The Northern Pipelines Package: CPPE

Once completed, the contractors will have installed a 2,900 km of pipelines, which include construction & modification of multiple associated facilities. The scope of ENPPI's contract for the Downstream Pipeline Haradh Increment (HUG-2) package involves engineering, procurement, construction, commissioning and startup assistance for laying 56-km long, 56-inch diameter, grade x70 gas pipeline.



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		
Country	Land	OffShore	Total	From Last Month	Land	OffShore	Total
Middle East							
ABU DHABI	36	19	55	-1	37	19	56
DUBAI	0	2	2	0	0	2	2
IRAQ	67	0	67	0	67	0	67
JORDAN	0	0	0	0	0	0	0
KUWAIT	41	0	41	-3	44	0	44
OMAN	52	0	51	0	51	0	51
PAKISTAN	20	1	21	0	20	1	21
QATAR	3	10	13	0	3	10	13
SAUDI ARABIA	97	18	115	-1	95	21	116
SUDAN	0	0	0	0	0	0	0
SYRIA	0	0	0	0	0	0	0
YEMEN	0	0	0	0	0	0	0
TOTAL	316	50	365	-5	317	53	370
North Africa							
ALGERIA	52	0	52	8	44	0	44
EGYPT	23	4	27	1	22	4	26
LIBYA	14	1	15	6	7	2	9
TUNISIA	2	0	2	0	2	0	2
TOTAL	91	5	96	15	75	6	81

Source: Baker Hughes

• هل تواجهون أية صعوبات فنية كبيرة فيما يتعلق بتطوير الاكتشاف الجديد؟

•• يتمثل التحدي الرئيسي، الذي يواجه مشروع حوض خليج البحرين، في المسائل اللوجستية البحرية التي تنتج بشكل رئيسي عن تباين أعماق المياه التي تتراوح بين اليابسة والمناطق البحرية، بما في ذلك متطلبات النقل ومساحات تخزين معدات التصديع. ونود أن نشير أيضا إلى أن محدودية خدمات ومواد التصديع الهيدروليكي في المنطقة، تعتبر مشكلة أخرى يتعين أخذها في الاعتبار بالنسبة لمشروع تطوير غاز العنيزة الأولي. فيما تشمل التحديات الأخرى لمشروع الغاز العميق قلة البيانات الجيولوجية والجيوفيزيائية للمناطق العميقة والمناطق البرية المحدودة (لا سيما في مناطق القمة بالتكوينات المحدبة)، فضلاً عن مشاكل الإنتاج المحتملة؛ مثل الصنفرة بالرمل.

وبصرف النظر عن هذه الصعوبات، تحظى شركة «تطوير للبترول» بواحد من أفضل الفرق النقنية في هذا المجال الذي يضم أعضاء مستعدين ومؤهلين للتعامل مع أية تحديات قد تواجه مشاريعنا.

• ماذا عن حقل البحرين .. كيف تعملون على تعزيز الإنتاج هناك؟

•• بالنسبة لحقل البحرين، تحافظ «تطوير للبترول» على معدل إنتاج ثابت من خلال حفر ٦٩ بئراً إضافية جديدة، واستهداف مكامن الأحمدي والمودود والخريب، ومن ثم نحصل على ما إجماليه ١٠٢١ بئرا جديدة تم حفرها منذ إنشاء شركة «تطوير للبترول» في ٢٠٠٩. وقد نجحنا في المحافظة على قدرة إنتاجية تبلغ ١,٤ مليار قدم مكعب يوميا من الغاز غير المصاحب، مما مكننا من سد احتياجات المملكة من الطاقة خلال فترات ذروة الطلب والطلب المتوسط. وقد تابعت شركة تطوير للبترول إجراء التقييمات الفنية وأعمال التطوير في كل مكمن.هذا، وتخطط الشركة لمواصلة التركيز على تحسين خطط استخلاص النفط المعزز؛ مثل زيادة حقن غاز المودود، وبئري أوستراكود/المقوع الأفقيين بواسطة التصديع متعدد المراحل، وزيادة القدرة الإنتاجية في مرافق المعالجة، وحقن البخار، وأساليب الرفع الاصطناعية. وقد أظهرت جميعها إمكانات جيدة لاستخلاص المزيد من النفط الصعب من حقل البحرين.

• ما مدى أهمية التكنولوجيا في تعظيم قيمة الاحتياطيات الحالية؟

•• عندما حملت شركة «تطوير للبترول» على عاتقها مهمة إدارة حقل البحرين، كان إنتاج النفط في المملكة يقارب ٣٦ ألف برميل يوميا. ومنذ ذلك الحين، نجحت الشركة في زيادة معدل الإنتاج إلى أكثر من ٦٠ في المائة. ويرجع ذلك - بشكل رئيسي - إلى تفاني موظفينا في عملهم، وعدم ادخارهم جهداً للارتقاء بمستوى الشركة، هذا فضلاً عن الاستعانة بمعارف وخبرات شركاتنا السابقين، وتطبيق التكنولوجيا الجديدة، إلى جانب التركيز على إنتاج الأفكار الإبداعية. ونأمل في مواصلة المحافظة على معدل الإنتاج، إن لم يكن زيادته، على الرغم من التحديات الهائلة التي نشهدها حاليا، والتي تشمل انخفاض أسعار النفط العالمية. وقد شرعنا - منذ ٢٠١٦ - في اتباع نهج الفريق متعدد الاختصاصات الذي يهدف إلى توحيد جهود موظفي العمليات الميدانية والصيانة وهندسة المرافق، وهندسة المكامن، وهندسة الإنتاج، علاوة على سلسلة التوريد لغرض تحسين إنتاج النفط. وقد أجرى الفريق العديد من التحسينات على السطح وفي باطن الأرض، من بينها تحسين العمليات، وتحديد المعوقات الطبيعية، ومراجعة الآبار التي يأتي أداؤها دون المستوى، إلى جانب استكشاف طرق جديدة لتحديد الفرص المتاحة، والسعي المتواصل لتعجيل سير الأعمال الأخرى في المشروع.

كذلك طوّر فريق نُظم المعلومات الجغرافية، في شركة «تطوير للبترول»، تطبيقه الخاص لنظم المعلومات الجغرافية الذي يعمل في وقت آني، والمُصمَّم لزيادة الوعي التشغيلي بالأحداث التشغيلية الحرجة من خلال استخدام بث بيانات مُرتّبة على خريطة مكانية تحت عنوان SCOPE أو المراقبة والتحكم في بيئة إنتاج العمليات. وقد تم تطوير هذا التطبيق ليكون بمثابة مشروع دليلي يشمل سمات محددة متعلقة بآبار الإنتاج التابعة لشركة تطوير للبترول، ويركز على سبع سمات؛ مثل أجهزة الإنذار الخاصة بالأحداث، بما في ذلك ضغط خط التدفق العالي، والآبار التي توقف الإنتاج بها، وتوقف العمل بشكل غير متوقع، وأخطاء جهاز الإرسال، وما إلى ذلك.

• ما هو دور الاستثمارات والخبرات الأجنبية في تطوير قطاع التنقيب والإنتاج حسبما يتراءى لكم في البحرين؟

•• أطلقت حملة ترويجية واسعة النطاق لحوض خليج البحرين والغاز بمكمن العنيزة الأولي، ومناطق التنقيب عن النفط والغاز البحرية في ٢٠١٨. كما أجريت العديد من زيارات مراكز حفظ البيانات خلال العام المنصرم تم خلالها استقبال شركات النفط العالمية من الولايات المتحدة وأوروبا وآسيا. وبالإضافة إلى ذلك، تم إطلاق مشروع ترويجي بالتعاون مع «سيتي جروب» لجذب اهتمام الشركات الأجنبية، لا سيما من أجل الاكتشافين الجديدين للنفط في حوض خليج البحرين والغاز في مكمن العنيزة الأولي، واللذين من المتوقع أن يحققا النتائج في منتصف ٢٠١٩. وخلال ٢٠١٨، أبرمت اتفاقيتا دراسات مشتركة مع شركة «توتال» إلى جانب اتفاقية تقييم تقني. كما أجريت مباحثات رفيعة المستوى مع شركة «إيني» بشأن التخصيص المباشر للمنطقة ١، ونتج عنها توقيع مذكرة تفاهم في يناير/كانون الثاني ٢٠١٩.

وتتطلع الشركة إلى البدء في جولة ترويجية لحوض خليج البحرين خلال الأشهر المقبلة من هذا العام في الولايات المتحدة. إذ أن النجاح الهائل، الذي شهده استخراج موارد النفط الصخري، تم بفضل التكنولوجيا المتقدمة التي طورتها العديد من شركات النفط العالمية وموردو الخدمات. ومن الجدير بالذكر أن خبرة الولايات المتحدة في إنتاج النفط الصخري سوف تساعدنا في اختصار المدة التي نستغرقها في تعلم وتطبيق هذه التكنولوجيا. ونحن حاليا بصدد جمع معلومات متعلقة بهذه الآبار لتكوين حزمة متكاملة يتسنى لنا تقديمها للشركات العالمية.

«تطوير للبترول» لديها أقوى فريق تقني في قطاع النفط والغاز

موقع حوض خليج البحرين في المياه البحرينية

آمالٌ عِرَاضٌ لصناعة النفط والغاز في البحرين

في مقابلة حصرية مع «النشرة النفطية - الشرق الأوسط»، تستعرض شركة «تطوير للبترول» البحرينية السبل التي تتخذها لتعظيم الاستفادة من أكبر اكتشاف نفطي في المملكة تم الإعلان عنه في العام الماضي. وتقول إنها نجحت في زيادة معدل الإنتاج إلى أكثر من ٦٠ في المائة. ويرجع ذلك - بشكل رئيسي - إلى تفاني المستخدمين في عملهم، وعدم ادخارهم جهداً للارتقاء بمستوى الشركة، هذا فضلاً عن الاستعانة بمعارف وخبرات الشركاء السابقين، وتطبيق التكنولوجيا الجديدة، إلى جانب التركيز على إنتاج الأفكار الإبداعية. وإلى نص الحوار:

• ما هو التأثير المحتمل للاكتشاف الجديد على الاقتصاد البحريني؟

•• على الرغم من انخفاض أسعار النفط، تسعى «تطوير للبترول» إلى المحافظة على مستويات إنتاج النفط والغاز. وقد أصبحت الجهود المبذولة في هذا الاتجاه الآن أكثر نفاذاً بفضل اكتشاف حوض خليج البحرين الذي يعد مصدراً بحرياً واسع النطاق للهيدروكربونات، وهو الكشف الأكبر منذ ١٩٣٢، إذ يتجاوز احتياطي النفط به ٨٠ مليار برميل من النفط الضيق. بالإضافة إلى ذلك، يعتبر اكتشاف ١٠ إلى ٢٠ تريليون قدم مكعب من الغاز الطبيعي في مكمن العنيزة الأولي، الموجود أسفل حقل البحرين، خطوة على طريق التنمية تنال ترحيباً كبيراً وتهدف إلى سد الطلب المتزايد على الغاز في مملكة البحرين.

• هلا أفدتمونا بمعلومات عن الوضع القائم للكشف الجديد، إلى جانب خطط التطوير المزمع تنفيذها؟

•• عقب اكتشاف الاحتياطيات الجديدة في حوض خليج البحرين في ٢٠١٨، وضعنا هدفا جديدا نصب أعيننا؛ وهو إدخال الحقل حيز الإنتاج في أقرب وقت ممكن. وقد تم اتخاذ قرار لبدء أعمال الحفر والاختبار لحقلين في جزيرة أم النعسان. وبدأ حفر البئر الأول في ديسمبر/كانون الأول ٢٠١٨ ومن المتوقع الحصول على النتائج من البئرين مع نهاية ٢٠١٩. ونظرا لتراجع معدلات الإنتاج الحالية في مكمن الخُف، ومن أجل تلبية احتياجات الغاز المحلية المتزايدة، سيجري اختبار تكوينات الجبة والجوف وبدء الإنتاج فيهما في أواخر ٢٠١٩. وفي ٢٠١٨، تم إجراء تخطيط موسع لتقييم خطط الحفر المختلفة لتكوينات كلٍ من الجبة والجوف اللذين يقعان أسفل مكمن العنيزة. كما تم أيضا إجراء أعمال الصيانة، وحفر الآبار الجانبية المتشعبة، واختبار تكوينات الجبة في الحوض ١ إلى جانب الآبار القائمة. كما يتم الآن الإعداد للتدخل من أجل اختبار تكوين الجوف. ويتضمن البرنامج الحالي حفر عدد يصل إلى ثمانية آبار بحلول نهاية ٢٠٢٠.

كذلك تعكف «تطوير» على الإعداد لحملة إقليمية جديدة للاستحواذ على البيانات السيزمية ثنائية الأبعاد، والتي تستهدف مجالات الاهتمام المختلفة من أجل فهم التركيبات الجيولوجية الأكثر عمقا بشكل أفضل. وقد تم إطلاق المشروع في ٢٠١٨ بعد التواصل مع الهيئات الحكومية المختلفة للحصول على التصاريح اللازمة. وقد تم البدء في عمليات الاستحواذ الفعلية في فبراير/شباط ٢٠١٩، على أن تستمر حتى أبريل/نيسان ٢٠١٩. وسوف تضيف نتائج هذا المسح، التي من المتوقع استلامها في أغسطس/آب ٢٠١٩ ، قيمة لمناطق التنقيب عن النفط البحرية، وتساعد في الوقوف على فرص وجود احتياطيات هيدروكربونية جديدة.

المحتويات

القسم العربي

مقابلة

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ملخص محتويات القسم الإنجليزي:

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تُعنى بالنفط والغاز والبتروكيماويات

النشرة النفطية

الشرق الأوسط

العدد الثالث 2019

آمالٌ عراضٌ لصناعة النفط والغاز في البحرين

شركة «تطوير للبترول» البحرينية تستعرض السبل التي تتخذها لتعظيم الاستفادة من أكبر اكتشاف نفطي في المملكة تم الإعلان عنه في العام الماضي.
بالإضافة إلى أحدث أخبار قطاع النفط والغاز عبر منطقة الشرق الأوسط.