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Oil · Gas · Petrochemicals

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Kuwait progresses its energy ambitions

- Challenges and opportunities for the downstream industry
- IMO 2020 – winners and losers
- Advances in metering technology
- An integrated approach to corrosion control
- Countering oil and gas cybersecurity threats

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Editor's note

KUWAIT IS A hugely promising market as it looks to boost production to four million bpd by 2020 and makes progress on major projects such as the Al-Zour refinery, LNG import terminal and the development of its heavy oilfields. See our features on ps11 and 14 for updates, as well as advice on approaching the market.

With the increased focus in the region on refining and petrochemicals to add value, we preview the first GDA International Downstream Conference & Exhibition, and feature expert views on some of the challenges and issues the industry is facing (p24).

We also examine the impact of the new IMO fuel oil regulations (p16) and technology trends for oil shipping (p46), as well as reporting on the latest compressor developments (p32). While our technology section covers corrosion prevention, metering technologies and cybersecurity.

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OCTOBER			
9-11	**Oil & Money conference**	LONDON	www.oilandmoney.com
9-10	**Basra Megaprojects - Oil, Gas & Environment**	ISTANBUL	www.cwcbasraoilgas.com
15-17	**Middle East Electricity Saudi 2018**	RIYADH	www.middleeastelectricitysaudi.com
16-18	**SPE Int'l Hydraulic Fracturing Conference & Exhibition**	MUSCAT	www.spe.org.events
17	**GPCA Digitalisation Workshop**	JUBAIL	www.gpca.org.ae
23-25	**GDA Int'l Conference & Exhibition**	MANAMA	www.gdaconference.org
NOVEMBER			
12-15	**ADIPEC**	ABU DHABI	www.adipec.com
27-28	**4th Annual Health, Safety & Security Forum**	DUBAI	www.hse-forum.com
DECEMBER			
5-7	**Iraq Oil & Gas Basra**	BASRA	www.basraoilgas.com
11-12	**ME-SPEC**	MANAMA	www.me-spec.org

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

Enhancing HSE perform nce

The 4th Annual Health, Safety & Security Forum takes place in Dubai from 27-28 November 2018 under the patronage of the UAE Ministry of Health and Prevention and with the support of the RTA Dubai, ADNOC, Emirates Authority for Standardization & Metrology and Emirates National Accreditation System.

HEALTH, SAFETY AND security are receiving an increased focus in the UAE, in response to rapidly evolving security threats worldwide, as well as continued growth in the country's commercial property, financial and tourism sectors. Fire protection also has huge growth potential, with the Middle East fire security market estimated to grow annually by 12.5 per cent from 2012 to 2020, making it one of the largest in the world.

Continuing the highly acclaimed event series, the 4th Annual Health, Safety & Security Forum will bring together HSE practitioners, government regulators, policy makers and solutions providers to share insights and experiences on critical health and safety issues. It will highlight best practices, strategies, process improvements and technology advances for the enhancement of HSE performance in the UAE, as well as endeavouring to align world class principles with local industry requirements.

The main themes this year include occupational health in the era of big data; preventing accidents caused by falling from height; crafting a behavioural change strategy; creating a resilient and productive workforce by investing in employee health; and managing security risks in the oil and gas industry.

Speakers include Raed Al Marzouqi, head of section, Occupational Health and Safety, Dubai Municipality, a stalwart of previous forums, who will speak on preventing accidents caused by falling from height, while Jorge Manuel Miranda Dias, Professor, Electrical and Computer, Engineering Department, Khalifa University Abu Dhabi, will discuss how to detect abnormal behaviours and human crowd modelling using video.

With numerous studies underlining the business benefits of investing in health and safety, Dr Ola Ahmed Mira, Head of Environment & Occupational Health & Safety, Ministry of Health, UAE will discuss the benefits of investing in employee health to create a productive and resilient workforce.

Photo Credit: Technical Review Middle East

Raed Al Marzouqi, Head of Section, Occupational Health and Safety, Dubai Municipality, will return to the 4th Annual HSE Forum in Dubai this year.

Farah al-Ansari, Head – Airport Security, Dubai Airports, will discuss embedding a world class security culture whilst ensuring stakeholder engagement. Also speaking will be Dr Mohammad Aref, OSH expert, Ministry of Human Resources & Emiratization.

A panel comprising Dr Rebab Al Ameri, director – National Accreditation System, Emirates Authority for Standardization & Metrology; Dr Ola Mira, and a senior representative from ADNOC will discuss how to achieve 'zero incidents' in onshore and offshore operations.

Harnessing technology will feature strongly at this year's event. The role of artificial intelligence and robots will be discussed, along with leveraging data technologies and analytics to improve HSE performance. The use of UAVs to inspect hazardous locations, VR as a learning tool and the effective use of wearable technology will also come under scrutiny.

A highlight of the event will be a mock evacuation fire drill to prepare for emergencies, following its successful introduction at previous Forums. Other special features will be a workshop presented by the Ministry of Health, and an innovation showcase, featuring the latest products and technology.

The 4th Annual Health, Safety & Security Forum will provide a valuable opportunity to obtain an update about the latest HSE developments and regulations in the region, learn about the strategies, technological advancements and best practices for the enhancement of HSE performance, and meet face to face with leading decision-makers from industry and government. ■

For further information and to register, see the website at www.hse-forum.com

ADIPEC 2018 throws the spotlight on digitalisation

THE ABU DHABI International Petroleum Conference & Exhibition (ADIPEC) will take place from 12-15 November at the Abu Dhabi National Exhibition Centre (ADNEC).

The world leading oil and gas show is expected to attract more than 110,000 trade professionals from around the world and more than 2,200 exhibiting companies, including 39 NOCs and IOCs, and 29 international country pavilions, featuring the most advanced technologies, products and services.

Digitalisation will be a key focus for the 2018 edition. According to recent research by McKinsey, a range of interconnected emerging technologies have the power to unlock a potential US$50bn in savings and increased profit. Encompassing fields such as artificial intelligence (AI), blockchain, robotics, sensor technology, machine learning, deep learning and edge computing, digitalisation is expected to cut capital expenditure by 20 per cent, with operating costs in upstream cut 3-5 per cent and 1-3 per cent in downstream.

"Digitalisation is an urgent priority for industry CEOs and business leaders, offering cost savings, operational improvements, and safety and environmental gains that will reach into every corner of the business, but the opportunities come with risks that must be understood and navigated," said Jean-Philippe Cossé, vice president – Energy at dmg events.

"ADIPEC is responding to this with a new Digitalisation in Energy zone, supporting innovation, and helping drive smart investments that will be the foundations of business success in the years ahead."

Spanning both the exhibition halls and the strategic and technical conference programmes, the Digitalisation in Energy zone will include top technology providers and new start-ups serving the oil and gas sector. A purpose-built Innovation Theatre will provide tech companies with the opportunity to host expert talks and take digitalisation out of the technology silo and place it at the centre of a much bigger conversation.

The premier meeting place for energy ministers, global business leaders and C-level executives from the world's oil and gas giants, ADIPEC 2018 will see the return of the event's highly regarded strategic and technical conferences, while also continuing the expansion of the exhibition and conference programmes.

Image Credit : Wallis

ADIPEC 2018 is expected to attract more than 110,000 visitors and will feature more than 2,200 exhibiting companies

Conference sessions for the downstream refining and petrochemicals sector, introduced for 2017, will return to ensure that ADIPEC covers each link in the oil and gas value chain. The co-located waterfront Offshore and Marine Exhibition and Conference will add a commercial dive zone, while other returning features include the ADIPEC Awards, which celebrate excellence in energy, and Young ADIPEC, a dedicated 'edutainment' programme designed to encourage students to choose a career in energy.

New for 2018 will be an Inclusion and Diversity in Energy conference programme, continuing and expanding on the work of the Women in Energy conference in previous years and exploring ways to build a diverse and inclusive oil and gas industry.

Hosting more than 100 ministers, CEOs, and global oil and gas business leaders as speakers, ADIPEC brings together the companies, decision and policy makers that shape the future of oil and gas supply, for four days of focused business, dialogue and knowledge transfer addressing today's energy challenges and defining tomorrow's hydrocarbon landscape.

The technical conference programme, organised in collaboration with the Society of Petroleum Engineers (SPE), sets the international standard for the exchange of best-practice and operational excellence in the world of energy. Sessions cover upstream, midstream and downstream sectors, including specialised programmes such as offshore and marine.

For further information see the website at www.adipec.com.

Basra Megaprojects - Oil, Gas & Environment

DESPITE THE UNSTABLE political situation in Basra, Iraq's production and exports continue to grow, with production hitting 4.65mn bpd in August 2018.

The 5th annual CWC Basra Megaprojects Conference - Oil, Gas & Environment will be held from 9-10 October in Istanbul, Turkey chaired by the EU Ambassador to Baghdad, Ramon Blecau. In a show of support for the rebuilding of Iraq, Ambassador Blecau and industry experts will highlight the business opportunities available in the resource-rich South of Iraq with the aim of driving more investment to develop the country's industrial infrastructure.

The conference takes place under the patronage of Basra's Governorate, Council and oil company and looks to find solutions to the challenges of Basra's oil and gas megaprojects and increasing Iraq's oil and gas production, as well as highlighting the upcoming infrastructure projects for gas, water, electricity and environment. All the major operators will be participating in discussions, including BP, Shell, Basra Gas Company, LUKOIL, Petronas and Chevron.

Basra holds 60 per cent of Iraq's crude oil reserves and 70 per cent of its gas reserves. There is strong potential to develop the gas industry to meet the need for gas-fired power. A number of blocks are offered for development, and major projects underway include the expansion of the Basra refinery and a new Basra-Aqaba pipeline which will transport crude oil from Kirkuk and Basra to Ceyhan in Turkey via the Mediterranean sea.

For further information see the website at www.cwcbasraoilgas.com


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Gas capital expenditure boost to fuel the energy transition: DNV GL

NATURAL GAS PROJECTS are expected to receive a significant investment boost over the coming years, which will enable gas to overtake oil as the world's primary energy source in 2026, according to DNV GL's 2018 *Energy Transition Outlook*.

The outlook predicts global upstream gas capital expenditure to grow from US$960bn in 2015 to a peak of US$1.13 trillion in 2025. Upstream gas operating expenditure is set to rise from US$448bn in 2015 to US$582bn in 2035 when operational spending will be at its highest.

While DNV GL's model predicts global oil demand to peak in 2023, demand for gas will continue to rise until 2034. New resources will be required long after these dates to continue replacing depleting reserves.

"The energy transition will be made up of many sub-transitions. Our Outlook affirms that the switch in demand from oil to gas has already begun. Significant levels of investment will be needed in the coming decades to support the transition to the least carbon-intensive of the fossil fuels," said Liv A Hovem, CEO of DNV GL – Oil and Gas.

"Gas will fuel the energy transition in the lead-up to mid-century. It sets a pathway for the increasing uptake of renewable energy while safeguarding the secure supply of affordable energy that the world will need during the energy transition," Hovem added.

Image Credit : hansenn/Adobe Stock

The forecast points to a faster, leaner and cleaner oil and gas industry in the future

Rising global demand for gas will impact activity across the oil and gas value chain, according to DNV GL's Outlook. Conventional onshore and offshore gas production is forecast to decline from around 2030, while unconventional onshore gas is expected to rise to a peak in 2040. DNV GL expects this trend to lead to leaner, more agile gas developments with shorter lifespans.

North East Eurasia (including Russia) and the Middle East and North Africa will account for most onshore conventional gas production in the lead-up to 2050, while North America will continue to dominate unconventional gas production. In the offshore sector, the Middle East and North Africa (MENA) will see the highest annual rate of new gas production capacity from now until at least 2050.

Liquefied natural gas capacity will increase as production rises. DNV GL expects it to double by the late 2040s, as the midstream sector connects shifting sources of gas with changing demand centres. Seaborne gas trade is forecast to treble from North America to China by 2050. An increase in trade from Sub-Saharan Africa to the Indian Subcontinent and South East Asia is also expected.

ADNOC set to expand downstream city Ruwais

THE ABU DHABI National Oil Company (ADNOC) has announced major development plans for Ruwais City, a 6.9 sq km community near the Ruwais Industrial Complex in Abu Dhabi's Al Dhafra region.

The project will see the city's population nearly double, over the next 15 years, to more than 50,000 people, as well as the creation of thousands of new, specialised, highly skilled jobs in parallel with ADNOC's investment in its downstream operations.

Dr Sultan Ahmed Al Jaber, the UAE minister of state and CEO of ADNOC Group, unveiled the new Ruwais city brand identity – Where Opportunity Lives – in the presence of many government officials, local dignitaries, ADNOC shareholders and business partners and members of the community. The brand launch event included a VIP tour of Ruwais City, followed by lunch with the visiting delegation and ADNOC employees.

Image Credit : ADNOC

The initiative is in line with ADNOC's investment in its downstream operations.

The Ruwais City development plan complements ADNOC's decision to invest US$44.92bn to develop the world's largest integrated refining and petrochemicals complex in Ruwais. This industrial ecosystem, supported by the UAE's stable fiscal, legal and financial system, is designed to generate long-term sustainable value for investors by providing them with:

- Access to a diverse set of competitive materials, utilities and other best-in-class industrial services
- Proximity to growing markets
- Best-in-class community infrastructure that ensures an exciting work-life balance

ADNOC is also constructing more than 3,000 new residential units, bringing the total number of city housing units to more than 10,000, with more to be built as required. The city's development will also include a number of projects focused on lifestyle, recreation and community, including new beach facilities, a central park, traditional souq, 18-hole golf course, cricket field, running track and cycling track, as well as the expansion of the public transport network, a range of community and civic centres and a number of health centres.

Ruwais City will be further supported by the expansion of a range of integrated government service centres, including Ruwais City's first "Tamm" Centre. Instead of travelling to Abu Dhabi, residents can now obtain official government documents by visiting the Tamm Centre, a one-stop-shop offering a customised suite of services specifically designed to meet the needs of the community.

Through a combined program of strategic partnerships and investment, ADNOC will increase its range and volume of high-value downstream products, secure better access to growth markets around the world and create a manufacturing ecosystem in Ruwais that will significantly stimulate in-country value creation, private sector growth and employment. The strategy is expected to add more than 15,000 jobs by 2025 and contribute an additional one per cent to GDP per year.

Oman project finalist for Bentley awards

BENTLEY SYSTEMS, A leading global provider of comprehensive software solutions for advancing infrastructure, has announced an infrastructure project in Oman as finalists in Bentley's Year in Infrastructure 2018 Awards programme. The annual awards programme honours the work of Bentley software users advancing the design, construction, and operations of infrastructure throughout the world. Twelve independent jury panels of distinguished industry experts selected the 57 finalists from 420 nominations submitted by more than 340 organisations.

Oman Gas Company S.A.O.C.'s Asset Performance Solution for Reliability Management project in Al-Khuwair, Muscat, Oman, has been selected as a finalist in the Going Digital Advancements in Utilities and Industrial Asset Performance category.

Oman Gas Company transmits and distributes gas to 4.4mn people and most of the area's key economic industry facilities. To ensure consistent availability of its product, the company developed a reliability and integrity programme that digitised, automated and compiled all reliability and integrity data and management tasks into one platform with Bentley's AssetWise.

Andy Glyde, Middle East regional director for Bentley Systems, said, "We are pleased to acknowledge and celebrate this project in Oman that is named as finalists in Bentley's Year in Infrastructure 2018 Awards programme. This project is among the 57 selected this year, which represent the most outstanding digital advancements in infrastructure by Bentley software users around the world."

Winners will be announced at an awards ceremony on 18 October in London during Bentley's Year in Infrastructure 2018 Conference.

Fujairah storage terminal inaugurated

MOHAMMED BARKINDO, SECRETARY-GENERAL of OPEC, has inaugurated Brooge Petroleum and Gas Investment Company's (BPGIC) Phase II storage terminal in the emirate of Fujairah.

Barkindo visited Fujairah, the Middle East's largest commercial storage hub for oil products, on the occasion of the 2018 Gulf Intelligence Energy Markets Forum, which gathered senior energy industry executives from across the globe for a day of discussion and debate on the theme "How to Navigate the New-Normal of Global Oil & Gas Trade Flows."

Image Credit : Gulf Intelligence

Mohammed Barkindo, secretary-general of OPEC, has commended BPGIC for its contribution to the development of the energy industry

The expansion of the BPGIC's existing Fujairah terminal is set to introduce storage for crude oil and will have a storage capacity of 600,000 cu/m, taking BPGIC's total capacity to one million cu/m. Phase II will enable BPGIC to store crude oil through the construction of eight storage tanks, half of which will have a convertibility feature for fuel oil.

"We are very happy to see that there are new investments going into the oil and gas industry, and we commend BPGIC for its efforts to grow and to positively contribute to the development of the energy industry," said Barkindo.

Agreement signed for centre of scientific research in DTVC

HOUSTON-BASED NATIONAL ENERGY Services Reunited Corp. (NESR), a provider of integrated energy services, through its subsidiary, National Oil Technology Company, has signed an agreement with Dhahran Techno Valley Company (DTVC), a subsidiary of King Fahd University of Petroleum (KFUPM). The agreement calls for the creation of a global centre for the development of scientific research in Dhahran Techno Valley.

Prof. Dr. Sahel Abduljauwad, acting rector of King Fahd University of Petroleum and Minerals, and chairman of the Board of Directors of DTVC, stated, "I am very pleased to see this level of investment from NESR to promote scientific research and local content in the energy sector in Saudi Arabia. Dhahran Techno Valley brings together the largest number of national and international energy companies in one place and is now the largest of its kind in the world. Techno Valley provides the necessary infrastructure, services, and the appropriate climate to incubate the development of new technologies as part of the implementation of the Saudi Vision 2030."

Sherif Foda, CEO and chairman of NESR commented, "We are very excited to partner with Techno Valley and KFUPM. We strongly believe that with this investment, we are taking an important step to develop fit-for-purpose techniques and technologies for Saudi Arabia as well as the whole region. This is a key milestone for NESR and we plan to also bring our technical partners from North America to this centre, which will allow them to customise and develop technologies in Saudi Arabia for the local industry. This will also be a great opportunity to provide high-end technical opportunities for Saudi engineers and researchers and an important vehicle for partnership between the Saudi academic and industrial sectors."

KIPIC and Honeywell sign MoU

KUWAIT INTEGRATED PETROLEUM Industries Company (KIPIC) and Honeywell have signed a Memorandum of Understanding (MoU) to share expertise and promote world-class training and technology adoption at the Al Zour refining and petrochemicals complex in southern Kuwait.

The MOU calls for the development of a roadmap to enhance operational excellence at KIPIC. It also seeks to support the nation's Kuwaitization strategy, through the development of modern training programmes that will equip Kuwaiti engineers with the skills and capabilities needed to drive the future development of the country's energy sector.

Under the terms of the MOU, KIPIC and Honeywell are seeking to consolidate technical and engineering know-how and expertise and will explore avenues to train young Kuwaiti engineers. The two companies will also look to jointly develop new technologies and processes, and explore other areas of cooperation to ensure KIPIC's facilities benefit from the latest Honeywell technologies and services.

Image Credit : honeywell

The signing of the MoU

Saudi Aramco to boost drilling expenditure

SAUDI ARAMCO IS set to spend more than half a trillion Saudi Riyals on drilling activites over the next decade, according to the company's senior VP for Upstream Mohammed Y. Al Qahtani. He made the announcement at the graduation of the first cohort of students at the Saudi Arabian Drilling Academy (SADA), which equips Saudi students with the skills and capabilities required by the Saudi drilling industry in a bid to boost drilling capacity and local content.

Image Credit : Saudi Arabian Oil Company

Mohammed Y. Al Qahtani, Saudi Aramco's senior VP for Upstream

In August, Saudi Aramco awarded the first large-scope integrated services contract for its Marjan oilfield – the first of three major offshore expansions in Saudi Arabia, and the company's largest upstream development project this year – to BHGE, which will provide drilling services, coiled tubing services and drilling fluids engineering services in Marjan.

While in September the company awarded a contract to China Harbour Engineering Arabia for the construction of two drilling islands under the company's Berri Increment Program (BIP), the objective of which is to produce an additional 250,000 bpd of Arabian Light crude from the Berri oilfield.

Huge potential opportunities in Kuwait

A webinar run by the UK's Energy Industries Council (EIC) highlighted oil, gas and petrochemical opportunities in Kuwait, as well as providing tips for doing business successfully with the market.

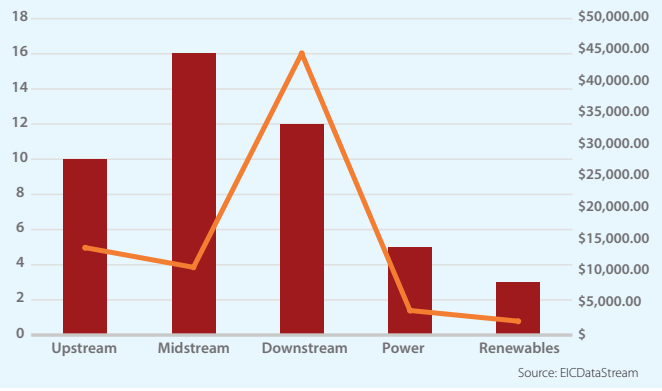
FOLLOWING THE INTRODUCTION from Luke Harris, overseas events manager, EIC, Jude Anthony, regional analyst MENA, EIC, gave an overview of major projects in Kuwait. Kuwait is progressing 10 active upstream projects with a capex of US$13.8 bn; 16 midstream projects with a capex of 10.7bn; and 12 downstream projects with a capex of US$44.5bn. As far as future projects go, from 2020-2025 Kuwait is planning two upstream projects with a capex of US$2.7bn and four midstream projects with capex of US$1.8bn. Major current projects include:

Northern Fields Development Project (Ratqa and Abdali fields) – US$5.38bn. Development of Rawdatain, Sabriya, Ratqa and Abdali fields which contain more than 35 Tcf of non-associated gas. First phase of Ratqa targets production of 60,000 bpd by 2019. The second phase is expected to target 120,000 b/d by 2022, and a third phase as much as 270,000 b/d by 2030. Operator: Kuwait Oil Company (KOC). EPC: Processes Unlimited/Al Rashed Group

The first phase of the Ratqa Lower Fars Heavy Oil is on course to be completed in March, 2019.

Al-Zour LNG Import Terminal – US$3bn. Development of a permanent LNG import terminal to handle 65,000 (T/D) of natural gas with a storage capacity of 1.8 million cu m of LNG. Includes the construction of a regasification system, eight LNG storage tanks with a capacity of 225,500 cu m each, two marine jetties, and berthing facilities for loading. Due for start-up in 2021. Operator: KIPIC. EPC: Consortium of Hyundai Engineering Company/Hyundai Engineering & Construction Company & Korea Gas Corporation.

Al-Zour Refinery – US$17bn. Development of a grassroots refinery to produce around 225,000 bpd of low-sulphur fuel oil to be used as feedstock by the Ministry of Electricity & Water for power generation. Refinery will be using 615,000 bpd of crude and 300 MMcf/d of gas feedstock. The new refinery is expected to replace the aging 20,000 bpd Shuaiba refinery. Project is divided into five major parts - two manufacturing units, utilities and services, and finally storage tanks and a pier. Due for start-up in 2022. Operator: KNPC. EPC: Package 1 - Main Process Units: Consortium of Tecnicas Reunidas/Sinopec Engineering Group/Hanwha Engineering & Construction . Package 2 - Secondary Units and Package 3 - Offsites and Utiltities: Consortium of Fluor Corporation/Hyundai Heavy Industries/Daewoo Engineering & Construction. Package 4 - Construction of Storage Tank Farm, Piping & Underground Works: Consortium of Essar Group/Saipem. Package 5: Marine facilities including subsea pipelines and an export island: Consortium of Hyundai Heavy Industries/Saipem /SK E&C/Essar Group.



Capex (US$mn) and number of projects - active projects

Image Credit : EIC

Offshore – the new frontier

Alan Menezes senior trade adviser, Oil & Gas and Renewables, UK Department for International Trade, highlighted the huge potential offered by Kuwait as it seeks to expand production, noting that Kuwait possesses 6.11 per cent of world oil reserves, and low lifting costs of US$8.5/bbl.

Menezes also noted the priority attached to the development of offshore resources to meet production targets. According to reports, Kuwait has floated tenders for offshore oil exploration and is looking to offer more concessions this year, with contracts due to be signed in the second half of 2018. Results of the first tender for the first exploration round are awaited, which should result in many opportunities.

He advised companies to seek legal advice before signing contracts, to perform due diligence on potential partners, and to understand the

Subsidiaries oil Kuwait Petroleum Company (KPC)

Inside Kuwait		
Kuwait Oil Company (KOC)	Upstream oil and gas	www.kockw.com
Kuwait Gulf Oil Compnay (KGOC)	Manages Kuwait's oil and gas resources in the partitioned zone	www.kgoc.com
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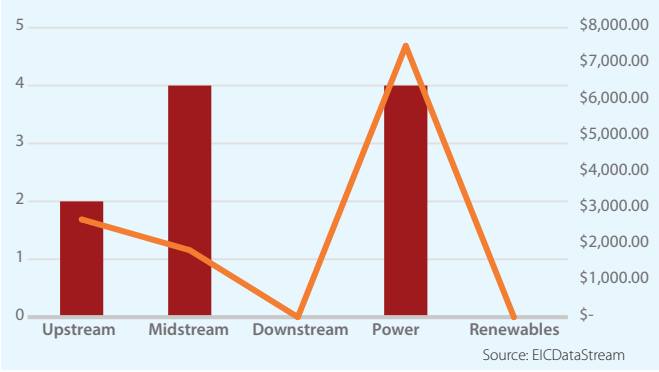
Outside Kuwait		
Kuwait Foreign Petroleum Exploration Company (KUFPEC)	Upstream oil and gas exploration and development	www.kufpec.com
Kuwait Petroleum International (KPI)	Refining and marketing petroleum products	www.q8.com

certification needs of the market, which are tight. Pre-qualification is needed by all K-companies (KPC and its subsidiaries). Companies need to have a regular presence in the market – and a fax machine is a must-have.



Capex (US$mn) and number of projects - future projects (start-up 2020 2025)

Image Credit : EIC

Colum Cantillon, project director, WorleyParsons Kuwait, highlighted the importance of planning and market research. He underlined the role of the major trading families and stressed that Kuwait is a relationship-driven society. Getting on to the approved vendors list with the K-companies, which has to be done individually for each K-company, can take up to two years and is also necessary if you are supplying to an EPC contractor. The K-companies have very particular codes and standards, he added, and while concessions can be made, they should not be taken as a given. A good local partner, patience, and deep pockets are essential requirements for doing business. "Do not expect to turn up and do business. You will not walk away with an order book full after a two- day business trip. Results can take up to two years." Understanding contracts is crucial, he stressed, adding that liquidated damages are applied on all government contracts.

> "Kuwait possesses 6.11 per cent of world oil reserves, and low lifting costs of $US8.5/bbl"

Gavin Aitken, director for Oil & Gas, Al-Rashed Holdings, commented that Kuwait presents great opportunities as it seeks to increase production from current levels of around 2.7mn bpd to more than four million bpd, which will require more drilling. KPC's published capex (within Kuwait) through to 2023 is KD52.071bn (around US$172bn). Tenders were floated last year for 85 new rigs and orders have started to be placed – around 25 / 30 new rig orders / LOI's are estimated to have been issued in the past two months. Offshore drilling IPM tenders are under evaluation now. The new Al-Zour refinery, existing refinery upgrades (CFP), new oil gathering centres/ EPFs and flowlines are all currently under construction. A gas treatment plant and further gathering centres are all to be tendered in coming months, and a major petrochemical plant is in the pipeline. Aitken noted that with the move to develop heavy oil, the cost of extraction and treatment is increasing, driving the need for more drilling, drilling services, processing and treatment.

"Kuwait is complicated, challenging, frustrating, and needs patience and perseverance. Do your research, visit, visit and visit again," he advised. Pre-qualification with the K-companies is best done with the support of a local sponsor. "You must have a local partner or sponsor to do business in Kuwait," he added. "Research and select your local sponsor very carefully."■

The EIC is taking a trade delegation to Kuwait from 3-6 December 2018. For further information see https://www.the-eic.com/Events/OverseasDelegations/Kuwait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The new LNG terminal currently under construction will have a capacity of approximately 22mn tonnes of natural gas a year.

Image Credit: muratart/Adobe Stock

LNG set to energise Kuwait's economy

The OPEC member is the first country in the Middle East to invest in a land-based LNG import terminal.

GLOBALDATA IN ITS report, *LNG Industry Outlook in Middle East and Africa to 2022* stated that Kuwait will lead the Middle East and Africa with total regasification capacity additions of 1,071 bcf. The country's regasification capacity will increase from 264.8 bcf in 2017 to 1,335.8 bcf in 2022 at an average annual growth of 32.4 per cent. The country is expected to spend approximately US$2.9bn on the development of regasification terminals during the outlook period.

Kuwait continues to lead the way in the region by being the first LNG importer to invest in a land-based LNG import terminal. The 22 mtpa facility, for which construction has begun at Al-Zour industrial area, with KPC subsidiary KIPIC as operator, is scheduled to come online in 2021.

Cedigaz's latest report examines the risks and opportunities of Kuwait's LNG strategy.

Despite Kuwait's significant gas reserves, LNG imports rose more than six-fold between 2009 and 2017, amid a growing focus on natural gas in the government's energy policy. In addition to bridging the supply gap with domestic gas production, the decision to invest in one of the world's largest LNG import facilities confirms plans to shift the structure of the country's energy makeup. Even if oil continues to dominate the primary energy mix, the growth of LNG imports is allowing gas to take a greater proportion.

"This comes at a time when reduced hydrocarbon revenue since the oil price collapse in mid-2014 has been exerting greater budgetary pressure. This is also placing more emphasis on economic reforms, starting with the phase-out of energy subsidies in order to reduce budget deficit and rein in per capita energy demand," said Fatima Sadouki – independent energy specialist, the author of the Cedigaz report.

Adding to economic challenges, other risks such as the growing climate change

agenda and uncertainty over future OPEC policy, are forcing authorities to adjust their strategy to maximise oil revenue in the medium term. With around half of Kuwait's current power capacity consisting of steam turbines mainly burning oil products, there is potential for gas to play a greater part in efforts to push high-value oil products to export markets. The transformation of Kuwait's downstream sector is another driving factor in the security of fuel supply strategy for power plants.

Soorya Tejomoortula, oil and gas analyst at GlobalData, explains, "Kuwait is increasing its LNG regasification capacity to meet its growing domestic power demand. The country is grappling with chronic electricity shortages, which are threatening its economic development. The new LNG terminal will also generate business opportunities to the local companies and help in promoting industrial growth in the country."

In December 2017, Kuwait signed a sales purchasing agreement with Shell International Trading Middle East Ltd. that will start in 2020, KPC and Shell said in an emailed statement. Shell has been supplying Kuwait with the super-cooled fuel since 2010 but did not say how much gas is covered under the new contract. While KPC is working to boost local natural gas production, Kuwait has a "pressing requirement" to secure natural gas supplies in the meantime, they said.

LNG could help meet Kuwait's domestic demand for power to run air conditioners during hot summer months and cut the amount of crude oil burned instead of exported for profit. The contract will cover two to three million metric tonnes of LNG a year, priced at 11 per cent below Brent benchmark, according to an unnamed Bloomberg source.

Kuwait wants cleaner burning energy sources such as natural gas to reduce emissions and improve air quality, according to the Shell and KPC statement.

The new LNG import terminal at Al-Zour, with an estimated capex of US$3.3bn, will be the top planned regasification terminal in the Middle East and Africa region in terms of regasification capacity, according to GlobalData. The project includes the construction of a re-gasification facility, storage tanks and marine facilities. KIPIC plans to borrow up to US$2.6bn from local and foreign banks and export credit agencies for the project and it is being built by Hyundai Engineering, Hyundai Engineering & Construction Company and Korea Gas Corporation.

The US$2.6bn international debt facility, with a maturity of around 15 years, is coordinated by four banks, and will partly be backed by the Export-Import Bank of Korea (Kexim) and Korea Trade Insurance Corporation (K-Sure).

The local loan will be worth up to US$800mn, with Islamic and conventional tranches, one source said. Kuwait Finance House is leading the Islamic tranche and National Bank of Kuwait the conventional one, with Gulf Bank and Commercial Bank of Kuwait also involved.

The LNG supplies from the facility will feed the power plants in the nation, enabling them to generate enough power to meet electricity demand during peak times.

With the growing availability of global LNG supplies and expectations of affordable prices in coming years, along with the boosting of Kuwait's LNG import facilities, the cooled fuel is becoming a key element in Kuwait's energy policy. ■

The GCC refining sector has seen tremendous growth over the past few years

Image Credit : Philipus/Adobe Stock

IMO 2020 - winners and losers

A new report from the Arab Petroleum Investments Corporation (APICORP) assesses the impact of the new IMO fuel oil regulations on shippers and MENA oil producers.

THE REPORT, ENTITLED *IMO 2020 on MENA: Impacts Varied* analyses the impact on the Gulf's oil dynamics of new fuel oil regulations for the shipping industry set by the International Maritime Organisation (IMO).

From 2020, ship-owners will have to comply with a new 0.5 per cent cap on the amount of sulphur in marine fuel, compared with the existing limit of 3.5 per cent. The immediate impact will be on consumers of High Sulphur Fuel Oil (HSFO), namely shippers, but also on refineries that produce large quantities of HSFO.

Ship-owners will face several options: continue to use non-compliant fuel oil and install scrubbers that clean out exhaust fumes including sulphur content, burn LNG or methanol, or use compliant fuels such as Low Sulphur Fuel Oil (LSFO) and marine gasoil. However, it is unclear which of these options will be the most cost effective, making it difficult for ship-owners to take a firm decision.

In the case of burning gas, the availability of these fuels is restricted to northern Europe, whilst LNG bunkering has not developed globally and the lack of infrastructure will restrict LNG-based power to ships moving on standard and short haul routes. Shippers considering a switch to LSFO will not only have to factor in the higher cost of the fuel, but supply restrictions in the short to medium term will create uncertainty around its availability in bunkering ports around the world.

Even in the event that the global market is able to produce sufficient quantities of the fuel, there is no guarantee that machinery on ships designed to run on high viscosity/HSFO can switch to low viscosity/LSFO. If they can't, installing scrubbers in ships is another option; but the cost of retro-fitting the necessary equipment may be prohibitive, and is only a short term solution, as it may not be able to meet more stringent regulations that may be introduced in the future.

The shipping industry's choice of option will directly impact the supply/demand dynamics of the Gulf's oil industry, and the results will be varied. In 2017, demand for fuel oil averaged 7.5mn bpd of which 3.5mn bpd was HSFO, used mainly in bunkering. Going forward, the IMO regulations will reduce demand for HSFO whilst demand for both LSFO and marine diesel will increase. Other things being equal, the differential between sour-sweet crudes, HSFO-LSFO and distillate-HSFO could widen. In the short term, the ability of the global refining industry to produce an estimated 8mn bpd of compliant bunker fuel for the world's ships by the IMO target of 2020 will be tested. Depending on assumptions about scrubber uptake, the resulting boost to demand for marine diesel alone is expected to be around 2.1-2.5mn bpd.

> "The shipping industry's choice of option will directly impact the supply/demand dynamics of the Gulf's oil industry"

GCC refining capacity (kb/d)

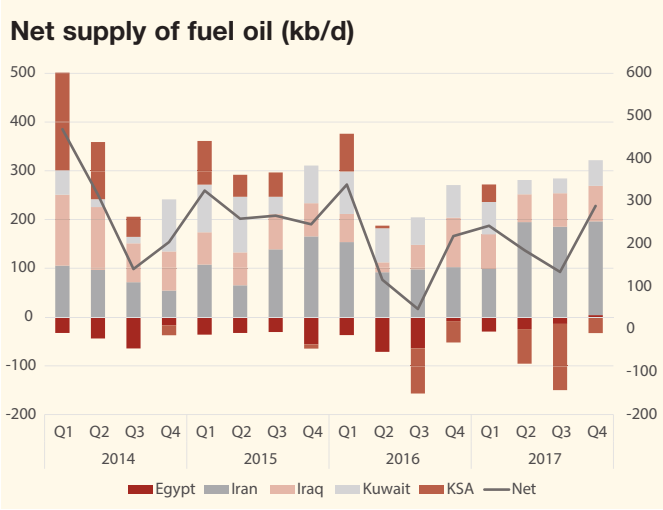
	2017 capacity	2018-2022 additions
Bahrain	267	100
Oman	311	230
Qatar	292	0
KSA	2,907	400
UAE	1,124	70
Kuwait	936	615

Sources: APICORP Research

GCC in a good position

The GCC refining sector has seen tremendous growth over the past few years, driven by significant investments in complex refineries during a period of high oil prices. The completion of Yasref and Satorp in Saudi Arabia and the expansion of the Ruwais facility in the UAE added approximately 1.2mn bpd of new and cleaner refining capacity. Built with an eye on supplying the growing Asian market, these new refineries have contributed to turning the GCC countries into a net exporter of refined products in 2016, particularly in the diesel segment. Over the next five years, new capacity will be dominated by the two major additions in Saudi Arabia and Kuwait, as well as clean fuel projects in the region. They will adhere to stringent European requirements for cleaner fuels, and will thus provide GCC refineries with an edge in a more competitive market.

In the likely scenario that there will be more reliance on LSFO and marine diesel, the downstream sector will create winners and losers, with simple refineries at most risk. Refineries that failed to invest in cokers and other residue destroying equipment needed to contain HSFO production will find it difficult to market the fuel. On the other hand, more complex refineries will benefit from higher margins. In the highly competitive refining market, this could pave the way for further closures. In particular, Saudi Arabia could benefit significantly if shippers choose to switch to LSFO or marine diesel, as it will be able to meet this demand and increase exports. On the other hand, if scrubbing is



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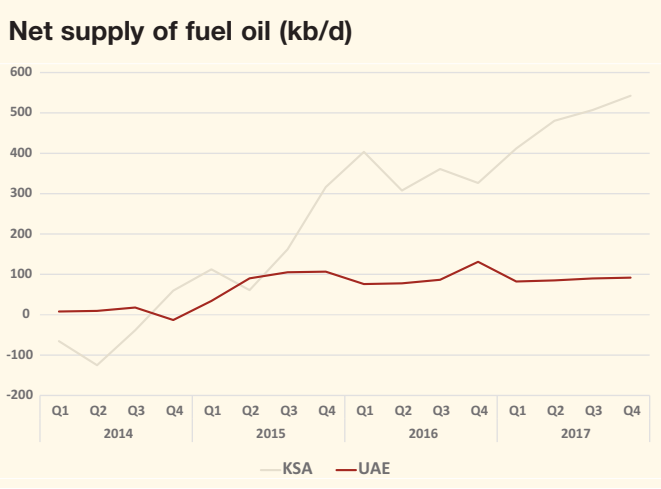

Source: APICORP / JODI Data

the preferred route, there is enough demand from the country's power sector to absorb its existing HSFO production, and at a reduced cost.

Geared to producing more diesel, the GCC will be in a good position to adjust to the IMO rules, with ample opportunities for the likes of Saudi Arabia and Kuwait to utilise excess HSFO in their respective power sectors. The GCC as a whole has embarked on many initiatives across the oil value chain that have helped them adapt to global developments. Some of these investments, such as additional refining capacity, were built with an eye to supplying a growth in Asian demand for diesel driven by China. But the decision taken by the Chinese government to rebalance the economy and shift away from manufacturing and more towards consumer goods and services dampened the prospects for diesel exports. The timely changes in IMO regulations have provided the GCC with an alternative market for diesel exports.

Gloomy picture for Iraq and Iran

For Iraq and Iran, on the other hand, the picture is gloomy. Already struggling to meet domestic demand, the damage to Iraq's Beiji refinery drastically reduced the country's capacity. In addition, the refining sector as a whole is not as sophisticated as those in the GCC, and their ability to produce low sulphur fuel is questionable. Worse, with lower demand for HSFO, Iraq will struggle to get rid of the fuel, whilst the domestic power sector is not large enough to absorb higher quantities of HSFO, especially given that the majority of new power generation will be gas-fired plants.

> "The GCC will be in a good position to adjust to the IMO rules"

As for Iran, whilst fuel oil consumption has been increasing in the region driven predominantly by Saudi Arabia, and demand in the region more generally has been relatively stable, only Iran is exhibiting a fall in fuel oil consumption, declining from 382,000 bpd in 2014 to 214,000 bpd in 2017. This means that it will struggle to find a market for its excess HFSO, a situation made worse by the re-imposition of US sanctions; whilst its refining sector is not sufficiently sophisticated to produce LFSO, nor is there sufficient demand from the power sector.

Mustafa Ansari, senior economist at APICORP, commented, "The IMO regulations will create winners and losers across the industry. Uncertainty around the availability of LSFO, HSFO prices and scrubbing technology makes it difficult for ship-owners to take a decision on what outlet to adopt for IMO compliance. What is more clear is that demand for HSFO is likely to decline, whilst demand for compliant fuels such as marine diesel and LSFO will increase. This means that refineries that have the means to reduce fuel oil production, or that are geared to producing middle-distillates, such as those across the GCC, will benefit from the additional demand. By contrast, countries without this capability, and with fewer alternative sources of demand, such as Iran and Iraq, will not be able to absorb excess supplies of fuel oil." ■

For the full article see www.apicorp-arabia.com

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Pursuing operational excellence in Kuwait

Colin Chapman (president) and Ekaterina Kalinenko (project director) of Euro Petroleum Consultants [EPC] discuss how operational optimisation is being pursued in some of Kuwait's major refining and petrochemicals projects.

REFINERS TODAY HAVE a number of issues to address, such as market needs and opportunities for gasoline and/or diesel, power generation, coke production and petroleum gas utilisation, use of unconverted materials, dealing with budget constraints, and best ways of integration within an existing refinery (revamping and modernisation).

Refiners are looking for options to achieve production flexibility between diesel and gasoline maximisation – diesel and gasoline demand seem to be growing at almost equal rates – thus finding a balance is key to success.

A need for flexibility means that now, more than ever, operational optimisation will be key to achieving sustainable margins. Operators must fully understand the local and global market changes and select the investment strategy to best meet their goals and objectives, looking at how best to optimise their existing facilities.

To improve margins, refining companies have a choice of two paths that can help increase yield of light petroleum products: (1) primary distillation capacity addition or (2) deep conversion units to process heavier crudes and residues.

Of late, many companies have been looking into deep conversion processes, as they look to address the issues of efficient feed utilisation, product optimisation – a larger variety of products than a simple gasoline/diesel/fuel oil process scheme and refinery complexity increase.

A deep conversion process can be introduced to a plant, either through the construction of a new complex, or through a modernisation project, including unit revamps and upgrades. Each option has its own advantages: a new grassroots construction allows more flexibility of process configuration and parameters, but at the same time requires certain infrastructure, a new site and usually higher investments (CAPEX); while modernisation is the optimal solution when a unit is built in an operating plant where options for new construction are limited. Modernisation can be done in order to improve capacity of certain unit/s or to convert it from one process to another to best meet market demand.

Refiners today have a number of issues and challenges to address

Image Credit : VanderWolf Images

In each case there are a number of ways to achieve high level of process integration within the plant; an essential step is to define the most suitable technology option.

> "Now, more than ever, operational optimisation will be key to achieving sustainable margins"

Kuwait's ambitous projects

Kuwait is investing in a US$30bn + plan to become the region's clean fuels leader. This focuses on modernising and integrating the country's Mina Abdullah and Mina Al-Ahmadi refineries to meet future diversified market requirements while maintaining high safety standards through the Clean Fuels Project (CFP), as well as building the region's largest refinery, the Al-Zour plant, with the objective to produce one per cent sulphur LFSO (1st stage) and provide feedstock for further conversion. Clean fuels production is important for the country both in terms of environmental protection policy and profitability improvement.

Once completed, the reconfigured and integrated Mina Abdullah and Mina Al-Ahmadi refineries will decrease the sulphur in gasoline production from 500 ppm to less than 10 ppm. Benzene and aromatics concentrations will also decrease. Bunker fuel oil sulphur content will decrease from 4.5 ppm to 1 ppm, and maximum sulphur content of full-range naphtha will drop from 700 ppm to 500 ppm. With the construction of Al-Zour and the upgrading and integration of its existing domestic refineries, Kuwait is set to become the largest producer of clean fuels in the Middle East by 2019.

These extremely large projects require thorough re-evaluation at each stage, strong control over main project objectives, well-organised coordination between numerous

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parties involved, and experienced teams to manage the projects. Localisation, the use of best industry practices, and the implementation of up-to-date technologies play an important role.

KNPC have increased the capacity of Mina Abdullah (MAB) and Mina Al-Ahmadi (MAA) refineries to a combined total of 800,000 bpd (MAA 346,000 bpd, MAB 454,000 bpd), connecting them as an integrated refining complex.

Kuwait Integrated Petroleum Industries Co. (KIPIC), a KPC Subsidiary, is building the grassroots refinery at Al Zour, which will be able to process 615,000 BPSD of light Kuwait crude oil or 535,000 BPSD of heavy mix Kuwait crude oil.

Kuwait Petroleum Corporaton (KPC) has awarded US$11.5bn worth of EPC contracts for the Al-Zour refinery project, which is targeted for completion in late 2018 or early 2019. Al-Zour will produce around 250,000 bpd of low-sulphur fuel to feed Kuwait's power stations and desalination plants, and a growing petrochemical industry.

> "KNPC has also focused on improving business performance"

The CFP investment cost for KNPC is estimated to be around US$16.9bn, and with the new refinery, the whole complex with connected utilities and facilities such as LNG tank farms and terminals, gas trains etc will require around US$40bn by 2020.

The value of ongoing contracts (signed and awarded by 2018) – is more than US$2.6bn, of which 19 per cent has been accounted for by local companies, a positive sign of the trend to use in-country resources and talent.

KNPC became convinced of the benefits of model-based versus factor-based estimating after seeing estimate variances drop from 40 to 15 per cent. KNPC now requires all interested EPCs to supply bids using a special Capital Cost Estimator.

After reviewing 30 plus refining options and schemes for deep conversion, KNPC chose a combination of ARDS (atmospheric residue desulphurisation)/coking/HCR conversion for bottom of the barrel upgrading.

KNPC has also focused on improving business performance. In these projects, revamps were given priority: debottlenecking of CDU, coking, HCR units; optimisation of AR FO production – major revamp of ARDS units at MAB refinery (+28 per cent capacity, +36 per cent catalyst lifecycle, higher distillate yield, LSFO quality).

Al Zour will have the world's largest ARDS complex, and several optimisation features were used in order to increase efficiency – i.e, heat integrated complex, maximised hydrogen recovery, efficient sulphur and condensate recovery, zero liquid discharge from wastewater treatment facilities, zero flaring design for flare gas recovery system, etc.

It is important to select an optimal project implementation strategy

Image Credit : zhu difeng / Shutterstock

There were several challenges to be addressed:

- safety – very high pressure;
- frequent catalyst changeover every two months for each train (catalyst lifecycle – one-year-period for heavy crude);
- complex catalyst activation and handling;
- highly corrosive and fouling service – inspection and monitoring needed;
- crude desalting and sulphur recovery – unstable salt and sulphur content in feedstock;
- compatibility of crudes.

Pursuing operational excellence

Another case of operational optimisation to be highlighted at these large facilities in Kuwait is the Operational Excellence programme implemented by Kuwait's Petrochemical Industries Company (PIC) which, in addition to manufacturing and marketing fertilisers, olefins and aromatics in Kuwait, participates in multiple joint ventures that produce and market chemicals both locally and internationally.

At the initial stage of the programme development, PIC's concept of operational improvements involved formulation of vision, strategy and objectives. The company decided to develop the programme on the basis of three standard principles: Lean Production (Lean), Quality Management (Six Sigma) and Project Management (PM).

Among the top priorities were HR performance, focus on the consumer's individual needs and the process approach under the slogan "Better, Faster, Cheaper!"

The operational performance metrics included criteria such as expenditure level, production cycle time and the rejection rate. Improvements were introduced by using a standard procedure aimed at building a knowledge management system as the backbone for further optimisation.

A critical factor was effective employee engagement, i.e. explicit goal-setting and adequate incentives, effective interaction and communication, and a consistent process of project evaluation and selection. Such a process needs to be well established, continuous and consider borrowing needs.

According to PIC, thanks to continuous leadership training of top managers, annual awareness sessions and quarterly training for identifying improvement possibilities the company saved US$173mn, successfully completed 524 projects, obtained 84 certified project managers (leaders), acquired new competencies and revised the corporate culture to conform to the best global practices.

To summarise, in order to sustain and increase margins refiners need to increase output quantity and quality with deep conversion and residue upgrading, choosing configuration and technology according to an in-depth study to evaluate which scheme best fits market and budget requirements.

It is also very important to select an optimal project implementation strategy, and take into account multi-technology options that provide a number of alternatives to a single process unit approach. These recommendations are not a 'cure-all' solution, but thorough analysis of best practices and opportunities within the company should form the basis of prospects and plans for the future. ■

EPC is a leading independent consulting company in the oil, gas and petrochemical sectors, as well as a producer of specialised annual international conferences and training seminars focusing on market trends, technological advances and business strategies for the petroleum industry. EPC has offices in Dubai, London, Moscow, Sofia and Kuala Lumpur. For more information, please visit www.europetro.com

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Advancing the Gulf's downstream industry

The first Gulf Downstream Association (GDA) International Downstream Conference & Exhibition (GDA Conference 2018) takes place from 23-25 October 2018 at the Bahrain International Exhibition Centre.

THE GULF DOWNTREAM Association (GDA) is a non-profit organisation aiming to bring Downstream players together to further develop the industry and draw benefits from knowledge sharing and best practices. Its founding members are Saudi Aramco, Kuwait Petroleum International (KPI), Bahrain Petroleum Company (BAPCO), Kuwait National Petroleum Company (KNPC) and Abu Dhabi National Oil Company (ADNOC).

Held under the theme 'Towards a competitive Downstream through innovation, collaboration and technology', the GDA Conference is the leading Middle East strategic platform for Downstream professionals to address business challenges, share best practices and unlock potential opportunities through collaboration and partnerships.

The conference, which is expected to attract more than 4,500 participants, will cover a wide range of topics under the broad themes of integration; digitalisation; energy; innovation and technology; and improvements. The future of Fuels, Future of Energy, Human Capital Efficiency and Future of Margins are just some of the topics which will be addressed by global industry leaders and specialists at the panel sessions. The accompanying exhibition will feature innovative products and services related to the downstream industry.

A wide range of interests will be represented, from refining and petrochemical companies, to storage and distribution companies, solutions providers, contractors, consultants, transportation companies and energy end-users, academia, government agencies and financial institutions.

Co-located with the GDA Conference is the Leadership Excellence for Women Awards and Symposium on 25 October, which will explore strategies to promote the advancement of women in the Downstream industry. ■

Image Credit: GDA

Audah Al Ahmadi, secretary general, GDA

www. gdaconference.org.

"Striving towards excellence, this forum aims at engaging regional and international stakeholders across business, academia and technology providers to capitalise on investment, innovation and growth."

Audah Al Ahmadi, secretary general, GDA

"Critical issues will be highlighted and innovative solutions shared. Professionals will be able to broaden their expertise network and capitalise on each other's strengths. Young engineers will be inspired to join the industry through personal interactions with the senior management. The event will pave the way for many significant initiatives for the future growth of the industry."

Raj Jhajharia, technical manager, GDA

"GDA brings the expertise from the major regional downstream industry companies together to share experience, strategies, ideas and to inspire each other."

Hadla S. AlFedaghi, engineer networks and security, IT, Kuwait Integrated Petroleum Industries Company (KIPIC)

"All relevant and important stakeholders involved in the future advancement of the Gulf's downstream industry will be present to share their experiences, technologies and future insights, which will benefit all participating companies and parties"

Søren Mikkelsen, sales liaison officer, Haldor Topsoe A/S

"My hopes from participating are to be exposed to different experiences and meet subject matter experts (SMEs) to gain technical knowledge."

Ahmed Ismail, defect elimination engineer, SASREF

"My hope is to create a momentum to boost collaboration within the GDA and with international oil and gas companies to guarantee the success in the next steps in developing capabilities; research and development; and technologies and innovation."

Khalifa Al Qallaf, joint venture management manager, Q8 – Kuwait Petroleum International Ltd

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New restrictions on the sulphur content of fuel oil for ships are a challenge for the downstream industry

Image Credit : Adobe Stock

Challenges and opportunities for the downstream industry

Ahead of the GDA International Downstream Conference & Exhibition, speakers and GDA Technical Committee members share their thoughts on some of key themes and issues affecting the industry.

Participants: Ahmad A Almulaifi, manager IT Group, Kuwait Integrated Petroleum Industries Company (KIPIC) (Speaker); Hadla S AlFedaghi, Engineer Networks and Security, KIPIC (Speaker); Khalifa Al Qallaf, joint venture management manager, Q8 – Kuwait Petroleum International Ltd (Technical Committee); Dr Pratap Nair, president and CEO, Ingenero Inc (Speaker); Raj Jhajharia, technical manager, Gulf Downstream Association (GDA) (Technical Committee); Rajesh Sivadasan, principal hydroprocessing technology specialist, Honeywell UOP (Speaker); Søren Mikkelsen, sales liaison officer, Haldor Topsoe A/S (Speaker); Ahmed Ismail, defect elimination engineer, SASREF (Speaker); Iain Mackay, COO Petrotechnics (Speaker).

What are the main drivers affecting the development and expansion of the Gulf's downstream sector, and the biggest challenges the sector faces?

Søren Mikkelsen: The main challenge for refineries is how to deal with The International Maritime Organization's (IMO)'s implementation of the Maritime Pollution (MARPOL) Annex VI, whereby from January 2020 ships are required to use bunker fuel oil with a sulfur content of no more than 0.5 wt per cent.

It is my strong belief that the stricter product specification requirements in transportation fuels and fuel oils in general will drive the development of the refining sector in the Middle East. The export of fuel oils from refineries will gradually diminish and refineries will integrate with petrochemical plants to convert fuels oils to petrochemicals.

> "We need to work hard on building human resources in the downstream sector"

Khalifa Al Qallaf: Factors include the local consumption and international demand for clean fuels; the integration of refineries with petrochemicals for new grassroots projects and conversion of existing facilities for maximum integration; and investing in R&D to move with the global direction to maximise our value proposition.

Challenges are the growth of renewable energy; environmental restrictions on fuel emissions, and the need for a well-established retention system, since we're losing the oil sector's SMEs (subject matter experts) after retirement. We need to work hard on building human resources in the downstream sector and build a Business Continuity Management System (BCMS) to prepare the Gulf for global changes, using all the available expertise in the Gulf through the GDA, as the GCC will be always be a global exporter.

Raj Jhajharia: I see challenges as disruption from technology (Electric Vehicles, ICE efficiency, autonomous car pooling;) IMO 2020 and Euro 5 diesel specifications; ageing assets; loss of expertise through retirement; feedstock price uncertainty; and lack of refining flexibility in feed and products.

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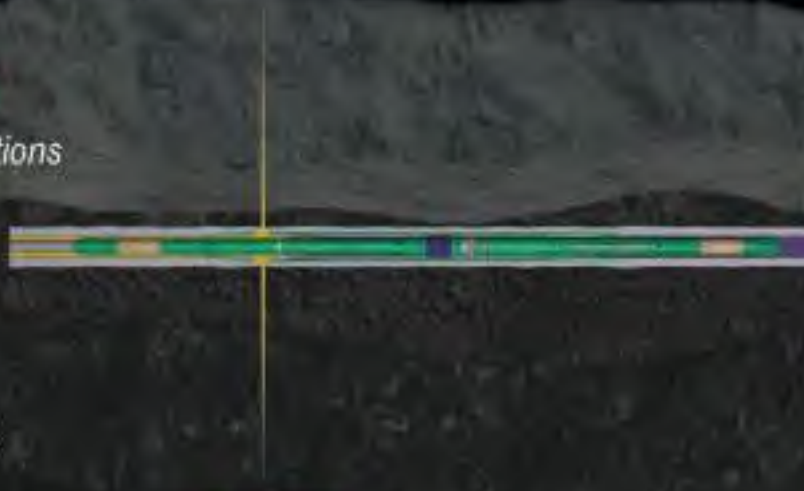

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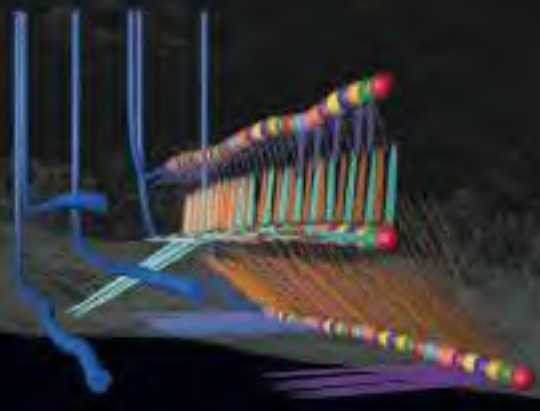

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Rajesh Sivadasan: With rising demand, price volatility due to the geopolitical situation and an ageing workforce, the downstream industry in the region faces three major challenges: reducing costs, optimising performance of existing assets and recruiting, retaining and developing the most diverse range of talent available.

Drilling and producing crude oil at competitive rates and then refining it to value added products at a lower cost to stay competitive in the market is one of the major challenges. NOCs in the region continue to face a dilemma of reducing their dependence on expatriates in the wake of a shortage in skilled and qualified nationals. Despite being a highly automated industry, human expertise remains critical with jobs requiring a wide array of skills ranging from highly technical to operational. Acquiring expertise in these areas requires years of training and experience. Recruiting, retaining and developing a junior talent pool is a challenge.

How important are collaboration and partnership to the future development of the industry?

Raj Jhajharia: Collaboration is the key for success in the future. The industry will benefit hugely from partnering with technology and start-up companies who can bring innovative ways of reducing cost and increasing margins. Partners should capitalise on each other's strengths rather than competing and going outside their core business.

Rajesh Sivadasan: In a challenging environment, no one player is able to succeed on its own. As business grows into new markets, collaboration is a necessity to enhance competitiveness and further enable the expansion and strategic integration of global business. NOCs in the region of late are collaborating increasingly with a range of partners, bringing together crude supply, resources, technologies, experience, and expertise of companies with an established commercial presence around the world. The most recent such downstream strategy was the JV between Saudi Aramco, ADNOC and a consortium of Indian national oil companies to jointly build, own and operate a refinery complex, whereby both NOCs had a secured offtake of their crude, as well as strengthening their access in one of the world's largest and fastest growing refining and petrochemical markets.

> "Digitalisation is going to take the industry by storm"

Iain Mackay: The Middle East oil and gas industry is consistently at the cutting edge of innovation. We work closely with the leading regional NOCs and we see evidence of this every day. However, collaboration and partnership with international companies is vital to help expand these capabilities and offer a new perspective on the operational environment. The international supply chain can offer a unique and holistic perspective on global best practice and help leverage these learnings into practical outputs for the region's NOCs. They already have great internal capabilities and are investing a significant amount of money in this area, but they are under-exploiting the external possibilities which can make it easier to discover new ideas and solutions.

Image Credit : Adobe Stock

Digitalisation is set to have a huge impact on the downstream industry

What impact is digitalisation having on the region's downstream industry, and how do you think it can develop in the future?

Ahmad A. Almulaifi: Technology or digital transformation is the main player nowadays to make organisations competitive and agile. The main benefit of digitalisation is to optimise business processes, increasing profits and reducing maintenance costs.

Hadla AlFedaghi: Digital transformation through business-driven digitalisation is the main driver affecting the development of the downstream sector. Effective use of digital technologies, especially AI (artificial intelligence), deep learning and IIOT has many benefits including the enhancement of operations and maintenance efficiency, establishment of smart refineries, enhancement of safety and reduced costs.

Many companies in the region are discovering and in the process of adopting mature business-driven technologies. It is also important to experiment and analyse emerging technologies such as blockcharin in oil and gas, since these are the technologies of the tuture.

Khalifa Al Qallaf: Today digitalisation in oil and gas industries is the survival kit as it will speed up decision-making, increase plant safety and optimise the processes. The question is, can the Gulf countries be in the position of digital world leaders? This is something we need to focus on. Do we plan to be a developer, or just a user?

Dr Pratap Nair: The downstream industry across the globe is only now beginning to leverage digital technologies such as the Digital Twin, IIoT, AI, Big Data Analytics, to name a few. Given the relatively newer assets and manufacturing technologies in the region, adopting digitalisation will help retain the advantage with respect to the older downstream manufacturing regions around the world. The downstream industry and oil sector at large, which typically face challenges like volatile market prices and various other factors, could benefit strongly from implementing a robust digital transformation programme, which can help with a nimbler and timely response to these disruptive changes. The downstream industry in the region is showing interest in digitalisation. The key will be to change the current ways

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business processes are managed, along with the implementation of digital technologies, to be able to utilise these technologies and realise improved reliability and efficiency of existing assets.

Raj Jhajharia: Digitalisation is going to take the industry by storm. Most manual-intensive jobs will be automated, systems and robots will replace humans to undertake hazardous jobs. Big data analysis and intelligence will provide accurate live status updates and precise failure predictions. People will have to upgrade their skills continuously to adopt fast- changing technology. It will also be greatly exposed to cyber-threats. Tougher laws, robust security and greater compliance will be required.

Ian Mackay: To date, the impact of digitalisation in terms of industry 4.0, the IIoT and cloud computing has been minimal, but the potential is huge. In the latest Operational Risk Survey by Verdantix, 73 per cent of respondents identified digital technology as essential or valuable for operational risk management with operational excellence programmes being identified as the main driver for implementation of operational risk software. Digitalisation can empower organisations. Take one of our clients, a leading Middle East oil and gas operator with a production capacity of over 250,000 BOE per day. We worked with them on their digital journey and they are now benefitting from US$6,500,000 in annual frontline efficiency savings; a 75 per cent reduction in crew wait time; a 50 per cent reduction in supervisor wait time and a 47 per cent reduction in annual downtime. This equates to an 8:1 return on digital investment.

To really grasp the opportunity of digitalisation, there needs to be a sustained leveraging of everything new technology has to offer. Each oil and gas company in the Middle East region is hugely innovative and each one has their own set of goals and unique attributes which differentiates them from each other and from the rest of the world.

It's important for organisations to look for the partner which best suits their business needs. Digitalisation done right is an ongoing process that changes the way organisations operate. It's about closing the loop between various departments, business processes, systems and silos of data within an organisation. It's about differentiation and fundamentally transforming end-to-end business processes empowered by technology to produce positive business outcomes.

Rajesh Srivadasan: The refinery of the future needs the flexibility and resources to produce a range of fuels, petrochemical compounds and other products. In addition, refineries will become more aware of energy efficiency. As a result, facilities will become far more complex and need close monitoring. As much as information technology is relevant in other industrial fields, it is essential in the oil and gas industry. The 'Internet of Things' (IoT) is driving the rapid pace of digital adoption across multiple industries, and the oil and gas industry is beginning a transformation of its own. Real-time data analytics, the IoT, automation, artificial intelligence and agile methodology are being used more and more towards data-driven solutions to develop a smart, connected refinery to boost performance, reduce downtime, enhance efficiency and reduce costs.

Image Credit : Adobe Stock

Partnership and collaboration can help to enhance competitiveness

> "Knowledge sharing and cross-fertilisation will enhance the region's experience in the drive for excellence"

What role can international companies play in the region's downstream development, and in helping to expand capabilities?

Dr Pratap Nair: The requirement to help expand capabilities in the downstream cannot not be met by existing local company expertise alone. Collaborating with international consultants and service providers having experience with digitalisation applications for this industry, can help the region's downstream sector speed up the development and assimilation of these technologies and work processes to improve the reliability and efficiency of utilisation of the already built up assets. Such collaboration is not a new concept for the region, given that historically, international companies have played a contributing role in the development of the region's downstream assets.

Ahmad A. Almulaifi: International companies can assist a lot by helping the region's downstream to adapt the digitalisation culture, as the main challenge for regional companies is to change to new ways of doing day-to-day business.

Khalifa Al Qallaf: This is both an important and difficult question. The available technology providers today are the only option we have to move on with our plans. Do we plan to make and buy license agreements, or to establish medium to long-term partnership models to serve technology and research developments? In my opinion the partnership model is needed to address future technology transfer and the patent process for research and development plans.

Ahmed Ismail: In my opinion international companies can help to promote downstream development in the region as they have the knowledge, competence and experience to improve downstream facilities. I would not say rely on them completely; however, knowledge sharing and cross-fertilisation will enhance the region's experience in the drive for excellence. ■

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Making a vital contribution to rig safety

BAUER KOMPRESSOREN IS proud to introduce the newly developed nitrogen generator SNG 4S which supports critical applications on the rig.

Blow Out Preventer (BOP), Blanketing and Inerting are the typical applications, where this nitrogen generator plays a vital role.

Not having nitrogen at high pressure on the rig could be as risky as explosion of the rig.

The unit makes instrument air available on the rig through air separation membranes and delivers high purity nitrogen (98 per cent) at high pressure (5,000 psi).

The SNG 4S offers a solution to the high cost and high risk of ship-to-shore transport of high-pressure nitrogen cylinders. Its well-designed layout takes up minimal deck space and requires nominal ship utilities for use, while the aluminium frame and corrosion-resistant materials provide the utmost reliability in the harshest of offshore environments.

BAUER KOMPRESSOREN GCC will participate at ADIPEC, where it will be located in Hall 13, stand 13030.

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The SNG 4S is the world's most compact nitrogen generator, according to the company

Image Credit : BAUER KOMPRESSOREN

CompAir Ultima compressors selected for Saudi Arabia's first IWPP

SHUAIBAH WATER & ELECTRICITY Company (SWEC) has selected Gardner Denver's revolutionary new CompAir Ultima compressors to supply oil-free compressed air to Saudi Arabia's first independent water and power plant (IWPP).

Generating 1,200MW of electricity and 800,000 cu/m per day of water every day, the facility is one of the largest independent water and power plants in the world, supplying to cities including Makkah, Jeddah, Taif and Al-Baha.

The Gardner Denver team found SWEC's previous system was not producing the quality or volume of compressed air required, particularly when additional demands such as the plant's ash handling system was factored in too. Furthermore, with traditional oil-free compressors typically over-heating due to the high ambient temperatures in these environments, Gardner Denver recommended its new Ultima technology to help overcome this challenge.

As a result, four 160kW Ultima compressors were specified for the plant, to be used for the site's steam turbine generator, three boilers, auxiliary equipment, flue gas desulphurisation unit and electrostatic precipitators.

A ground-breaking new compressor launched by Gardner Denver as part of its CompAir brand, Ultima is a revolutionary new, water-cooled oil-free compressor. It offers up to 12 per cent improved energy efficiency compared to a conventional two-stage machine, with a 37 per cent smaller footprint. Available in models from 75kW to 160kW, the technology is ideal for applications that demand the highest levels of air quality and purity.

Ultima is engineered to ensure that no warm air is vented in to the compressor room. Instead, this warm air is processed within the machine enclosure and, using a heat exchanger, the air is cooled and then re-circulated via the base frame around the compressor. As a result, no heat is wasted, no dust or particulate matter enters the compressor, and the inlet air stays cool. The compressors are also all offered with iConn, a cloud-based, air management platform that helps operators manage, optimise and improve compressed air services.

Image Credit : Gardner Denver

The Ultima oil-free compressor is ideally suited to meet the demands of Saudi Arabia's first IWPP

High performance solution Mohsen Hamed Al Salmi, technical director at SWEC, said, "The Ultima compressor offers a high quality, high performance solution that is ideally suited to meet the needs of our plant. The fact that the company was able to supply the new compressor solutions just one month after the order was agreed was hugely helpful, ensuring we could meet the increased water and electricity demands that Hajj brings."

Amr Ismail, oil-free and nitrogen sales manager at gardner Denver FZE, added,

"As Industry 4.0 drives manufacturers to share and analyse asset data, organisations are demanding more intelligent insights into their compressed air performance that can help remove risks, improve productivity and reduce energy consumption. iConn offers this capability to SWEC by delivering historic, real-time, predictive and cognitive analytics, which can help users address any potential issues before they become a problem. Available as standard on all new CompAir machines, iConn can be retrofitted to existing compressor installations too."

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Getting closer to the ustomer

Italy-based compressor manufacturer ROTAIR recognises that people, and not just machines, are at the heart of any business. Rhonita Patnaik sat down with Jayanthan Ramasamy, ROTAIR's sales manager – Middle East, to gain an insight into the company's success.

ROTAIR, WHICH SPECIALISES in manufacturing and distribution of portable screw air compressors across the world, has been present in the Middle East since 2000, and its enduring success in the region reflects the situation for the company worldwide, Ramasamy comments.

"Today we are a well-known compressor brand in the USA with a 12 per cent market share. This was achieved in a span of only four years despite the fact that the country is a demanding market for compressors with higher regulations on emissions and standardisations. ROTAIR is the first manufacturer to have Tier 4 Final compliant units for the USA market without the need of a costly DPF filtration system. Also, by using water-based paints and adhering to the most advanced regulations in terms of noise level, ROTAIR respects all the latest environmental norms throughout the world. So you can imagine that it is a tough market.

"As a European brand, we were able to penetrate the USA market because we sat down and listened to customer demands. Our motto was not just to sell the equipment but to provide suitable solutions. In the Middle East too, our distributors have played an immense role in our increasing market share. Since we are present in all countries via our distributors, we make sure that they are well versed in ROTAIR products.

> "With excellent support from its distributors in the Middle East, ROTAIR tripled its growth in 2017-2018"

"The products' superior design and excellent performance in job sites has been the cornerstone for our growth story. ROTAIR is already working on improvisation of some of the models as part of its continuous improvement philosophy. We are also looking to increase our product range, above 900 CFM."

Image Credit: ROTAIR

ROTAIR manufactures all its compressors at its plant in Caraglio, Italy

The designs are environmentally friendly and adhere to most of the stringent international standards on quality and processes. The company takes pride in its design abilities and is known for a number of patents in the industry. Design, manufacturing and testing of airends – the heart of any rotary compressor – is all inhouse. ROTAIR uses internationally well-known engines such as Perkins, Kubota, Deutz, Cummins and JCB. Most of the models have two different engine options, offering flexibility for customers.

Looking closer to home, Ramasamy says ROTAIR wants to emulate the USA model of innovating and working closely with distributors to become the leader in the region. "Despite hardships, with excellent support from its distributors in Middle East, ROTAIR tripled its growth during 2017-18 as compared to the previous year. With 90-plus ROTAIR trained sales and after-sales personnel in the GCC, the company expects to continue a healthy growth trend in the following years."

The compressor manufacturer is also renowned for providing custom-engineered solutions. The company collaborates with customers to understand their changing needs and designs solutions accordingly. "Long-term partnering has been a key differentiating factor for the company. Our compressors are very simple and easy to use and require less maintenance. Each compressor comes with a two-year unlimited warranty," Ramasamy stresses.

ROTAIR's job doesn't finish with delivering the equipment; the company recognises the importance of strong after sales organisation. ROTAIR's personnel regularly conduct periodic

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training for its distributors to refresh product knowledge and provide training of new machinery. "It is an ongoing effort from our end to boost aftersales initiatives and support our distributor network to get closer to the customers. Hopefully in the coming year, we should be able to roll out additional action plans."

The portable compressors of the MDVS line are suitable for mining, drilling and oil & gas operations

Image Credit : ROTAIR

Upward trend in sales

Ramasamy is also optimistic that in the coming months and with new investments, the region is going to see an upward trend in sales and shares. Since portable compressors have wide application and use, the demand for the product continues to be very strong in almost all industries across the region. ROTAIR compressors are simple in design yet rugged. They have been time tested for continuous use even in the hottest summer conditions in the Middle East. The compressors are made in Italy and the models available in the Middle East market are customised for the region. A tropicalised cooling system and heavy-duty filtration are standard in the regional version. Complete mechanical control systems and multiple engine options for customer choice are some of the brand's selling points.

ROTAIR compressors are suitable for a wide variety of applications in industries such as oilfield services, construction, sand blasting, optic fibre cable laying and general maintenance. The company is also focusing on the rental sector and has already developed a reasonable customer base with major rental companies within a short period.

ROTAIR'S wide range of diesel, petrol and hydraulic-driven compressors are suitable for the oil & gas industry, Ramasamy points out.

"ROTAIR has the capability to offer compressors for Zone 2 with inbuilt components such as chawlyn valve, spark arrestor, battery isolater, emergency stop switch and lifting pockets.

"Bunded chasis with a capacity to hold 130 per cent of total liquids in the compressor is available, making the compressors totally compatible with the stringent requirements of the oil & gas industry," he adds.

Turning to prospects for the oil and gas sector Ramasamy comments, "The oil & gas industry has been the mainstay of Middle East's economy for decades. Traditionally the region has offered rich opportunities to the upstream oil and gas sector. In addition, the region has embarked on a path to significantly increase its downstream capacities in the past few years.

"Even though the industry is facing challenges such as geopolitical tensions, low oil prices and an increased focus on renewables, the oil & gas industry will continue to play a significant role in the region's economy in the future.

"ROTAIR is proud to be part of this dynamic industry," he concludes. ■

Doosan Portable Power wins compressor order in Saudi Arabia

DOOSAN PORTABLE POWER (DPP) has won an order worth almost two million Euros for portable compressors in Saudi Arabia. The compressors have been purchased by the rental business, EJAR, based in Jeddah, through TAMGO, the authorised dealer for Doosan compressors, lighting towers and construction tools in Saudi Arabia.

The order is for 50 Doosan 9/235HA portable compressors each providing 23.4 m³/min (825 cfm) of compressed air at a rated operating pressure of 8.6 bar (125 psi). The 9/235HA is ideal for the full range of compressed air applications from construction, rental, utilities and manufacturing to quarrying, water well drilling, sand blasting and the oil and gas industry.

Gaby Rhayem, regional director Middle East and Africa for Doosan Bobcat EMEA, said, "The 9/235HA is a long-time staple of our industry and is the most popular compressor of its type in the Middle East and Africa. EJAR chose the 9/235HA for renewal of the company's rental fleet, based on the outstanding performance and durability of our products over many years."

With a well proven Doosan airend and powered by a fuel efficient Cummins engine, the 9/235HA compressor has been designed to ensure the unit performance, durability and reliability are guaranteed in the tough environment of the Middle East.

EJAR was formed in 2015 to provide customers with short and medium term rental solutions. With an array of products including compressors, trucks, lift trucks, cranes and welding machines, EJAR offers affordable, turnkey solutions for everyday rental needs.

TAMGO has long been providing customers in Saudi Arabia with a selected range of the world's most advanced equipment, backed by outstanding product support, services and solutions. TAMGO specialises in power solutions, as well as industrial and construction equipment.

Alvaro Pacini, president of Doosan Bobcat EMEA and Fadel Hassan, managing director of TAMGO

Image Credit : Doosan Portable Power

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An integrated approach to corrosion control

Oil and gas pipelines are prone to corrosion

Roland Anderson, executive VP at Cosasco, argues that the most effective corrosion protection approach combines the advantages of both intrusive and non-intrusive monitoring systems.

AS LONG AS there has been an oil industry, there have been corrosion and erosion. Upstream, midstream and downstream operators have constantly sought better ways to protect their assets and safeguard both health and safety and the bottom line.

Once upon a time, there were coupons to act as a proxy for metal loss. Then there were in-line sensors capable of monitoring corrosivity. Now there are non-intrusive, ultrasonic sensors capable of directly monitoring pipe wall thickness. The trend is for more sensors, more data and more monitoring at the expense of inspection. Progress. But it would be a mistake to read this as a story of each technology simply superseding the last. In fact, the most effective approach is to combine intrusive probes and non-intrusive sensors under new procurement arrangements, to give an integrated perspective that is greater than the sum of its parts. To understand how, we need to disentangle cause and effect.

The end-effect: non-intrusive sensors

Whether the problem is corrosion or erosion, ultimately the end-goal is to minimise metal loss. Gradual loss of pipe thickness can become a major hazard, threatening loss of containment, significant downtime and – in worst case scenarios – injury or loss of life.

It stands to reason then, that operators want to monitor and measure that metal loss. By keeping track, they can be proactive with repairs and minimise risks. In the old days however, this simply wasn't possible. Coupons, inserted into the flow, could provide a proxy reading for metal loss but there are simply too many variables for this to ever be completely accurate.

> “Gradual loss of pipe thickness can become a major hazard”

The recent advances in ultrasonic sensors then, have been something of a revelation for the industry. These can be affixed to the outside of the pipe wall, with no need to penetrate it (and consequently no downtime). They then use soundwaves to directly measure pipe wall thickness at a given location – no proxy readings, no estimates – concrete data.

This gives operators something they never had before. What's more, the fact that they are non-intrusive is seen as a major plus. They can be installed easily in high risk, harsh environments and feed back data wirelessly to corrosion engineers. Directly measuring metal loss is unquestionably the best option for erosion monitoring too.

The cause: in-line probes

This ability to directly monitor the effects of corrosion and erosion has rightly caused a lot of excitement in the industry. However, in some quarters, eagerness has seen some overstate the case for non-intrusive sensors, seeing them as a replacement rather than a complement for existing intrusive technology.

That would be to monitor the effect without monitoring the cause. Both are vital.

In the case of corrosion, operators often inject corrosion inhibitor chemicals into the flow in order to reduce corrosion rates and protect pipe wall thickness. This is a delicate operation that requires chemical levels to be finely balanced: too little and corrosion goes unchecked, but too much and not only do you waste (very expensive) inhibitor chemical, but this can counterproductively increase corrosion.

If an operator were only measuring pipe wall thickness – i.e. the effect – then they are left to make inferences about the corrosivity – i.e. the cause. This is possible in theory but it's like getting rocks when you need fine-sand level granularity. Having spotted a worrying level of metal loss, the operator might adjust inhibitor levels, but it might then be a week or a month before the effect of the change becomes apparent on the pipe wall. In the meantime, more damage is done.

Instead, it's worth measuring the cause itself. In-line, intrusive probes can directly monitor the corrosivity of the liquid flowing through the pipe, feeding back data to the corrosion engineer in real-time.

This allows the engineer to instantly tweak and fine-tune the level of inhibitor chemical used, without having to wait each time to see the eventual effect. Not only does this save on inhibitor chemical, it lessens risk and improves visibility and control.

Intrusive monitoring systems such as this are perceived by some as a health and safety risk as they involve penetrating the pipe wall. However, the improved corrosion management is in fact a major boon to health and safety, and sensors can be installed safely by trained engineers in the majority of locations. Only the most inaccessible and high-risk locations would prove problematic.

An integrated system – greater than the sum of its parts

It should be clear then, that the two technologies are better understood as complementary, not mutually exclusive, options. Each offers strength the other can't and makes up for the weaknesses of its counterpart.

However, by integrating both types of sensor into a single system, the advantages are greater than the sum of those listed above. Why? It's all in the data.

By having both sets of data feed wirelessly into a smart system that analyses both streams, you can cross-reference the data and use each to validate the other. For example, if the non-intrusive sensors detected a particularly severe reduction in pipe wall thickness in a certain location, this could be cross-referenced with the intrusive monitor data. If the level of corrosivity was also high, then the data is corroborated and the issue can be rectified.

> "Cause and effect are equally important to monitor"

If, however, an engineer was relying on one system or the other, validation would require manual inspection. This costs time and money and, in a hazardous environment, introduces an unnecessary degree of risk to the inspection team.

In fact, having live corrosivity and pipe wall thickness data streams can drastically reduce the need for an inspection regime at all. Defect monitoring becomes an automatic issue, and inspection teams would become the exception rather than the rule, reducing risk and cost.

A truly smart system could then deploy machine learning and big data analysis to detect patterns in the two sets of data, finding hidden patterns and correlations that could further reduce risk and improve control.

New procurement models

With new technology and approaches also come the opportunity for new commercial and procurement methods. No doubt any engineer will be aware of digitalisation and the Industrial Internet of Things (IIOT), but what does this mean in the context of corrosion monitoring and management?

Well, with the integration of intrusive and non-intrusive monitoring systems, it becomes clearer than ever that the real value to operators is in the information rather than the sensors themselves. As a result, suppliers are rolling out models such as leasing, effectively offering corrosion and erosion monitoring-as-a-service coupled with a monthly care package of reporting and analysis.

This is more than just a tweak to business models; it can make a major difference to corrosion engineers trying to make the business case for a best-in-class monitoring system. Buying a large number of sensors outright is typically classed as a capex spend. Switching to a leasing model enables corrosion engineers to procure the systems from opex, often expediting and easing the process.

By doing so, corrosion engineers stand to reap the benefits of a modern, innovative system that combines the advantages of both intrusive and non-intrusive monitoring systems. Contrary to the common misconception, it is integrated systems, not a rush to switch to purely non-intrusive ones, which will yield the most returns. Cause and effect are equally important to monitor, and by keeping an eye on both, operators can be smarter and more responsive. Ultimately that means money saved, risks reduced and assets protected. ■

Eisenbau Krämer announces equipment investment as confidence returns

EISENBAU KRÄMER (EBK), the Germany-based specialist in longitudinally welded steel pipe, has announced a multi-million euro investment in equipment to enhance its products and services offering.

The company has made significant investments in enhancing pipe end dimensional and shape tolerances, including state-of-the-art laser measurement technologies and a further process of pipe end expansion, which will enhance consistency in areas of ovality and out-of-roundness.

Further investments have been made to enhance EBKs existing capabilities in pipe profile cutting, full body pipe measuring, pipe tracking and traceability and plate edge crimping.

The investment programme comes as EBK sees an improvement in industry confidence, with a number of key projects progressing beyond final investment decisions. The company is experiencing strong demand in the Middle East, along with the North Sea, Africa and North America.

"While the industry has not returned to a full recovery by any means, we believe that the outlook looks strong, particularly in the business for structural steels and specialised products such as corrosion resistant alloys," said EBK technical managing director Dr. Scott McCann.

DNV GL raises the standard for thermoplastic composite pipes (TCP)

DNV GL HAS launched a new standard that allows operators to choose thermoplastic composite pipes (TCP) instead of steel or traditional flexibles, enabling substantial cost reductions throughout the project lifecycle.

After the successful and wide adaptation of the recommended practice (RP) DNVGL-RP-F119 by the industry for qualification of TCP for various applications from dynamic to static applications since its publication in 2015, the RP has now been converted to an official DNV GL standard DNVGL-ST-F119. This reflects the growing confidence in the TCP technology and the methodology of RP to deliver safe and reliable performance to the industry.

Almost a decade after the manufacturing of the first Thermoplastic Composite Pipes, this novel non-metallic pipe concept is increasingly gaining the attention of the oil and gas industry. Spoolability, significantly lower weight to strength ratio compared to conventional metallic pipes and the absence of corrosion, make TCP a potentially disruptive technology in the pipeline industry. Various pilot projects with different operators have been initiated in the past few years to use TCP in offshore oil and gas projects to cut cost and increase efficiency.

Throughout this time DNV GL has played the role of an independent certification body for TCP to facilitate the adaptation of the technology by the industry, while ensuring the reliability and safety targets comparable to conventional metallic pipes.

Since its publication, the RP has been the only available document for qualification of TCP in the industry and has been used in almost all of the TCP pilot projects across the globe, says DNV-GL. The design and qualification methodology of the RP has been adopted by all manufacturers of TCP as well as developers of hybrid flexible pipes in which the pressure armour within a conventional steel-based flexible is replaced by TCP.

Liv A. Hovem, CEO DNV GL - Oil & Gas stated, "The launch of the new DNV GL standard for TCP shows the industry is looking for innovative methods that reduce costs for their operations. The new standard gives the industry the trust and confidence that they can move forward with TCP safely across all lifecycle stages of a pipeline or riser."

An upcoming DNV GL type approval scheme being issued later this year will make it easier for engineers to design pipeline systems using TCP, the company says.

Increased demand forecast for corrosion resistant alloy (CRA) OCTG and clad and lined pipe

WITH THE REVIVAL of the oil and gas markets, drilling is picking up in sour gas fields and environments with higher levels of CO_2 and H_2S, driving increased demand for corrosion resistant alloy (CRA) OCTG and clad and lined pipe, according to the newly launched *Future of Corrosion Resistant Alloys* report from Metal Bulletin and Westwood Global Energy Group.

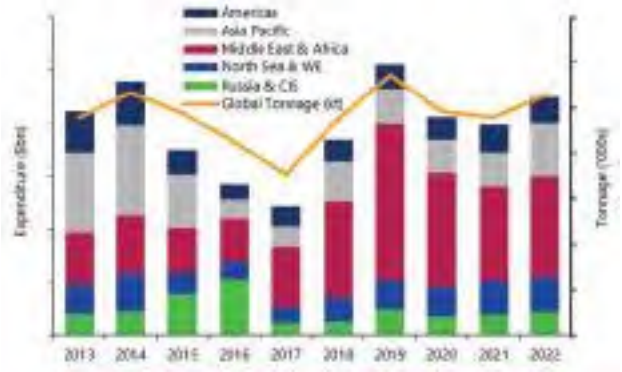
On the OCTG side, austenitic grades look placed to take market share, with cladded and lined pipes becoming the material of choice in linepipe projects on a global basis, taking share from solid CRA. The Middle East is expected to remain the largest consuming region worldwide in the chrome and CRA OCTG market, driven by expanding investment in sulphur exports from key regional producers and the high volume Barzan development in Qatar.

Key conclusions are as follows:

- For clad and lined pipe markets, a number of major contracts out in the market are set to lead to a period of robust demand in the next couple of years.
- Of all the grades, 13 per cent Cr will remain the largest volume consumed.
- 2019 is set to be a high year for pricing in for both clad and lined pipe, boosted by the strong demand and more limited capacity in Germany.
- Pricing growth is expected to be greatest among the highest grades such as nickel alloys, driven by increased activity in the offshore and deep-water basins.
- Supply for clad and lined pipe markets is dominated by Japanese and German mills, but over the forecast period there may be potential for mills in other Asian markets to make inroads.

Matt Loffman, associate director, Westwood, said, "As more gas and sour gas fields are targeted for production, a selection of oilfield equipment suppliers will need to prepare for elevated demand at a level beyond the relatively modest growth of the wider industry. This impacts both the OCTG and linepipe markets. While on the OCTG side, austenitic grades look placed to take market share, cladded and lined pipes are becoming the material of choice in linepipe projects on a global basis, taking share from solid CRA."

"As the revival of the oil and gas markets develop, drilling continues to pick up in more complex environments, often with higher levels of CO_2 and H_2S, which is driving increased demand for CRA OCTG and clad and lined pipe," said Dr. James Ley, principal consultant, Metal Bulletin Research. "These products, although extremely complicated to manufacture, generate wide interest across the steel tube and pipe industry due to the premium profit margins that can be achieved compared to standard carbon grades."



Total CRA Demand Outlook: OCTG and Clad and Lined Pipe

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A modular approach to multiphase meters

Lars Anders Ruden, Emerson Automation Solutions, discusses how multiphase meters are evolving to address new challenges.

MULTIPHASE METERS AND their ability to measure the individual phase flow rates of oil, water and gas have been part of the Middle East upstream environment for many years, replacing conventional and more expensive test separators and providing significant CAPEX savings and improved reservoir management. By using a multiphase meter, there is no need for a test separator, manifold or line, with each well tested without having to redirect to the test line.

Yet, like all technologies, multiphase meters must evolve to meet new challenges.

In the Middle East, for example, multiphase flow meters must now operate in a wide variety of flow regimes, including bubble, slug, mist, churn, slip and annular flows. The continued growth in brownfield oil and gas wells producing over a broad range of process conditions, where more liquid and water are present, has only gone to heighten the changing nature of these regimes.

> “In the Middle East, multiphase flow meters must now operate in a wide variety of flow regimes”

With changing flow conditions and ever-narrowing profit margins, multiphase meters are often considered unwieldy and expensive, with many operators put off by the scale and potential expense of such deployments, the inability to change solution mid-course, and the need to prioritise which wells warrant multiphase meters. In many cases, a one-meter-per-well strategy is simply not economically feasible.

A flexible and modular approach

It is against this backdrop and as a means of reducing multiphase meter costs and ensuring more flexible and accurate metering that Emerson has developed the modular Roxar™ 2600 Multiphase Flow Meter family based on a proven measurement technology platform used in over 1,500 meter installations worldwide.

This technology platform includes advanced signal processing, field electronics and electrode geometry, as well as high-resolution sensors capable of capturing small changes in the electrical properties of the multiphase fluid passing through it. The dual velocity system, cross-correlation capabilities and optional gamma system also provide measurements capable of handling multiple flow regimes.

Rather than being dependent on one technology solution for the lifetime of the well with the risk of failure and increased maintenance, the modular and flexible approach is based on different meter configurations that can be customised according to different applications. Emerson’s modular family of meters, for example, can be designed for the following applications:

- Trending water cut, gas breakthrough and flow rates from a single-well installation
- Generating high accuracy flow rates for oil, gas and water over a broader range of applications in a single-well installation
- Improving meter accuracy and robustness through the addition of a gamma source
- Providing flow back measurements, well testing and allocation metering in both single-well and multi-well applications.

Modular flowmeters can either be one component of an integrated well test system, function as an all-in-one multiphase flow meter at the wellhead that shares flow lines and provides continuous wellhead production test data, or provide standalone wellhead measurement. The fact that such meters are so cost-effective also allows for the possibility of allocating one meter per wellhead.

As conditions and operator demands change, so technologies need to keep up by reinventing themselves and embracing innovation. A modular approach to multiphase meters is a step toward achieving just that. ■

Emerson has developed the modular Roxar 2600 Multiphase Flow Meter family based on a proven measurement technology platform

New developments in metering technology

Honeywell has launched a new gas metering solution that provides easy-to-use health monitoring of midstream metering systems for operations, maintenance and leadership teams. With advanced real-time diagnostics, at-a-glance dashboards and intelligence analytics, Honeywell Connected Plant Measurement IQ for Gas enables operators to detect and correct costly mismeasurement, anticipate equipment failure, reduce gas losses and eliminate unnecessary maintenance.

Measurement IQ connects assets across all enterprise metering stations and captures the data in Honeywell's secure data centre. Users can connect on any device with a web browser and receive customisable alerts on their mobile phone with Honeywell's Experion® App.

The Connected Plant solution anticipates problems and enables users to move from time-based or risk-based recalibration of meters to condition-based monitoring with calibrations only when required.

TUV SUD NEL has commissioned an upgrade of its Primary Liquid Densitometer to deliver enhanced flow meter calibration accuracy. This will decrease flow measurement uncertainty and minimise financial exposure for both oil and gas operators and taxation authorities.

The new Primary Liquid Densitometer will provide the calibration traceability to primary standards for liquid density measurement at elevated temperatures and pressure required for flow meter calibrations at these conditions. It will also meet growing industry demand for enhanced calibration accuracy at elevated pressures, as well as density calibration services that support next-generation industrial flow measurement devices. It will support the company's Advanced Multiphase Facility (AMF), a high-pressure multiphase flow test facility currently being developed which will have the largest test range in the world.

The ST100 Series Thermal Flow Meter from **Fluid Components International (FCI)** provides precision CO_2 gas mass flow measurement in a highly reliable and fully HazEx agency approved no-moving parts instrument. It is particularly useful for EOR operations, where CO_2 is often used. The accurate measurement of CO_2 gas flow and pressure is critical to the success of the EOR process. In addition, accurate flow measurement is important for the efficient separation of the oil, natural gas, CO_2 gas and water components.The separated CO_2 gas and water components are then re-used to recover more oil. Accurately measuring the flow and pressure of the CO_2 gas is not only critical to the extraction process, but also helps reduce costs.

The ST100 Series Flow Meter can be calibrated to measure CO_2 gas and dozens of other specialty gases, as well as the mixed dirty or wet gases common in the EOR separation and re-pressurisation applications. Featuring a sophisticated thermal dispersion technology air/gas flow sensor design with optional pressure measurement, the ST100 meter combines repeatable measurement with feature- and function-rich electronics. It provides direct gas mass flow measurement and requires no additional sensors or flow calculating devices.

Countering oil and gas cybersecurity threats

The ongoing digitalisation of the oil and gas industry has introduced a new set of safety and security concerns that will need to be carefully managed. Schneider Electric has some advice.

Image Credit : Schneider Electric

Oil and gas facilities and other critical infrastructure are under threat from cyber attacks

CYBER-ATTACKS COST companies worldwide an estimated US$300-400bn each year in unanticipated downtime, and that number is projected to increase sharply. Some large industrial organisations estimate their cost of downtime in the millions of dollars per hour. When a plant shuts down unexpectedly, it takes three to four days to get everything started up again. These are sobering business continuity-related lost revenue numbers.

The more connected nature of oil and gas operations, driven in large part by the Industrial Internet of Things (IIoT) and related digitalisation trends, although beneficial to bottom lines, introduces an element of cyber-risk that should be addressed. In fact, inaction is not an option. Cybersecurity is now a cost of doing business. The question is, what is the optimal approach?

When considering the issue of cybersecurity and its impact on business continuity, several types of threats come into play. The first is the exposure of employees to outside emails. More than 400 businesses every day are exposed to email "spear-phishing" schemes draining US$3bn from businesses over the last three years. The percentage of emails that contain potential business disrupting malware today stands at one in 131, the highest rate in five years.

A second issue involves attacks by organised groups on critical infrastructure, such as oil and gas facilities. As such they are targeted not only by malevolent individuals but also by organisations that use cyberattacks as weapons to be used to weaken nation states and other global institutions.

A third element to consider when formulating a cybersecurity strategy is the proliferation of mobile devices. Cell phones, tablets, laptops and thumb drives in the hands of practically every oil and gas industry employee worldwide creates a need for the development of more modern and robust security policies. The added connectivity of these devices makes it easy for outsiders who guess or steal passwords to penetrate the control environment.

> "Cybersecurity is now a cost of doing business"

An approach for deploying cybersecure solutions

Fortunately, there are several steps that oil and gas companies can pursue in order to minimise the threat to cyberattack-driven disruptions to business continuity:

- Building firewalls to keep outsiders from entering the corporate network and gaining access to control systems. This will work in environments where entry points into the system are somewhat limited. However, in an IIoT world, cybersecurity will need to be built into every control system hardware and software component, protecting every node that has computing capability.
- A gradual approach to strengthening cybersecurity infrastructure. Responsible control systems manufacturers are now designing cybersecurity into every module they build and deliver so that clients don't have to concern themselves with building in cybersecurity after they purchase a new product.
- The education of employees. A cybersecurity-aware culture needs to be developed within oil and gas organisations to help employees understand or appreciate the major risks, so operations can be run in a secure manner (including basic password management or changeover management).

Such an environment should audit and enforce cybersecurity best practices on a consistent and effective basis, utilising available supervision and detection tools, so that exposure to risk can be minimised. In such a cybersecurity-aware process culture, the priorities of the IT and industrial control departments need to be aligned. Both employees and vendors coming in need to be aware of the security policies or risk being denied access to sensitive equipment and operations software. ■

See Schneider Electric's whitepaper 'A practical guide to achieving oil and gas operational efficiency through digitisation'. https://publish.ne.cision.com/l/udybljlac/ www.schneider-electric.com/promo/us/en/getPromo/75668P

Technology trends for oil shipping

Martin Clark looks at some techology trends shaping tanker industry safety on a global level.

OIL TANKER SAFETY is back in the spotlight. When the Panamanian-flagged Iranian-owned crude oil tanker Sanchi collided with the Hong Kong-flagged cargo ship CF Crystal in January this year, it led to one of the worst tanker incidents for several decades. After burning for more than a week, the Sanchi, which had been carrying 136,000 tonnes of natural gas condensate, eventually sank off the coast of Shanghai, China. The entire crew of 32 died in the incident, which was also the worst tanker spill in 35 years, according to the International Tanker Owners Pollution Federation.

This has it has been a wake up call for the industry. The underlying safety record in oil shipping is very good. In terms of total losses by type of vessel worldwide, only 16 tankers were lost between 2008 and 2017, according to Lloyd's List Intelligence Casualty Statistics, out of a grand total of 1,129 ships; more than half the losses were general cargo or fishing vessels. But all the underlying threats remain, while others have come into greater focus, including fire, which was the cause of loss for three of the 10 largest vessels lost in the past year.

"Tanker safety has improved significantly since a number of major pollution incidents led to improved ship design and improvements in risk management in the 1990s," a recent report by insurers Allianz states. "However, the large loss of life on board the Sanchi is likely to focus attention on the adequacy of fire protection for crew."

> "Unmanned aircraft systems could make a significant contribution to safety and risk management"

The report, *Safety & Shipping Review 2018*, also charts a number of other key trends shaping the industry, from the use of drones to the emergence of autonomous shipping.

Drones: Unmanned aircraft systems are finding a growing number of applications in the maritime sector, which could have the potential to make a significant contribution to safety and risk management, the report states. These include assessing environmental pollution, monitoring cargo loading and pirate activity along coastlines or carrying out cargo tank inspections. Drones could enable faster, more informed decision making on board, reducing the impact of any incident.

Cyber threats: This is an area the industry is taking seriously in the wake of the NotPetya cyber-attack of 2017, which led shipping giant Maersk to suspend operations and reinstall thousands of infected servers and computers organisationwide. The International Association for Classification Societies plans to publish guidelines covering cyber security practices in the shipping industry by the end of 2018. Last year, the International Maritime Organisation issued guidelines and called for cyber risks to be addressed in existing safety management systems by 2021.

Autonomous shipping: Like driverless cars, there is great interest around the world in crew-less vessels. These could one day, potentially, play a role in the energy shipping sector. However, legal, safety and cyber security issues are likely to limit the growth of such vessels for the foreseeable future, the Allianz report states. ■

The underlying safety record in oil shipping is very good

Image Credit : Kees Torn/Flickr

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Malfunctioning valves were behind the Deepwater Horizon disaster

Image Credit : US Coast Guard/Flickr

A strong performance **under fire**

Demand is growing for fire-safe valves, which can withstand explosions and blazes.

FIRES ARE A daily risk in the oil and gas industry. Fire hazards lurk in each step of the process – ranging from oil and gas production to transport, as well as in refineries and storage. Components thus need to be fire safe if they are to withstand threatening situations. No wonder demand is increasing for fire-safe valves.

Losses can be devastating in a case of emergency; therefore, safety is just as high a priority for valves as quality and a long life cycle. "Fire safe valves are mainly used in the oil and gas industry, as risk of fire is high," explains Stefan Keller, product manager at AS Schneider. The consequences could "understandably be substantial," he emphasises.

Explosions in refineries or on oil rigs are a threat to man and material. A defective blowout preventer with safety valves played a major role in the devastating catastrophe on the oil rig "Deepwater Horizon", in the Gulf of Mexico. The valves malfunctioned and 780mn litres of crude oil flowed uncontrolled into the ocean, causing several billion dollars of damage. Furthermore, eleven men died and 600,000 birds perished.

Other sectors also place their trust in fire-safe valves. Petrochemistry, for instance, where "filling processes of inflammable substances in tank farms" are usual, explains Vetec Ventiltechnik. In a critical situation, fire-safe valves have to stand the test in real conditions, particularly in view of having to handle fast filling times. Vetec developed a rotary plug valve with a double excentric plug design, which ensures that there is no contact between plug and seat while rotating, and no particles can adhere in between. "The housing is basically free of dead space, so no troublesome soot deposits can occur," states Vetec.

> "Fire-safe valves also provide the chemical industry with much needed security"

Testing for fire safety

Fire-safe valves also provide the chemical industry with much needed security. Ethylene oxide becomes highly flammable in contact with oxygen, reports Vetec. In an emergency, fire safe valves go through hell to keep the plant safe. Valves should not only have a fire-safe design, but also be certified as fire safe. Here, fire safe testing facilities come into play.

Specialised testing facilities leave nothing to chance and put valves through their paces. Take Amtec, for example. The company developed a new fire safe test rig to test valves according to DIN EN ISO 10497, API 607, API 6FA or API 6FB. "With this test rig, all important type acceptance tests for fire resistance can be conducted," says Manfred Schaaf, Amtec Advanced Measurement. Not only that: if needed, client-defined testing procedures can also be performed. This allows individual applications to be tested.

Safety is too important for things to stagnate. "Due to changing testing requirements the test rigs have to be modified again and again," states Schaaf. Investments are always required: just recently, the company put a test rig for cryogenic temperature applications into operation. Amtec is continuously expanding in the testing facilities field. Meanwhile, various testing facilities are available for testing seals, valves and stuffing boxes.

AS Schneider's valves and valve blocks have championed the load tests in a test rig. Even after extreme test conditions, the certified valves not only showed themselves leakage-free, but could also be fully operated, as well as opened and closed repeatedly without problems.

High-performance ball valves made by Hartmann Valves are another example. They can be operated in temperatures ranging between – 200 to +550°C, pressure stages up to 700 bar and with aggressive media. Realised entirely in metal, the sealing systems between ball and seat ring fulfil a leakage rate

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of A, or 0. Special construction features and safety-oriented functions such as DBB (double block and bleed), DIB (double isolation and bleed) and fire safe create higher levels of safety. This is a necessity, as the ball valves are used with all kinds of media, from oil, natural gas, acid gas, brine, oxygen or hydrogen, steam, thermal water and abrasive or degreasing media.

> “Fire safe has long become a seal of quality”

Material strength

What can increase the likelihood of a valve being certified as fire safe? Strength is important when choosing the material, especially as far as higher temperatures are concerned. “Not only do the materials used for the valve housing play a role, but also the material the screws are made from, and naturally also the material used for the seal are essential,” states Schaaf. Only then can a valve withstand its trial by fire.

Image Credit : Amtec

The test rig puts valves through their paces

“Fire-safe valves made from all common materials are in demand,” reports AS Schneider’s product manager Stefan Keller. “Exotic materials are more seldom,” he adds, as separate certification tests have to be made for different materials groups. Common and proven valves in the oil and gas industry are made from stainless steel and carbon steel.

Fire-safe products also let valve manufacturers score with special projects, such as power to gas plants.

Fire safe has long become a seal of quality. Companies in various sectors cannot do without this seal, and sometimes even are not allowed to. “We conduct fire safe tests for all new products to be used in such industrial sectors, from the ground up, in order to certify them,” states Keller. Demand, however, depends on the oil price, but is “continuing to rise”. Customers will always need fire-safe valves. ■

Innovations in these fields will be presented at Valve World Expo Düsseldorf from 27–29 November 2018. www.valveworldexpo.com

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Halliburton brings automation to hydraulic fracturing

Image credit: Ferrez-Frames / Adobe Stock

The new service uses automation to deliver better well performance

HALLIBURTON HAS UNVEILED its Prodigi™ AB Service, which automates the breakdown process of a fracturing treatment, helping to deliver better well performance. The service uses algorithmic controls and is supported by a Halliburton completion advisor who will tune the system to optimise the performance. Prodigi AB service helps improve overall efficiency, maximise the performance of perforation clusters and mitigate the risk of screen-out. It provides consistent design execution, better distribution of fluid across the perforated interval, and improved treatment pressures and rates. The service delivers improved precision to achieve a lower cost per BOE.

Michael Segura, vice president of the Production Enhancement business line said,"Prodigi AB Service offers a significant change in the way we are able to optimise our hydraulic fracturing operations in real-time, accelerate the learning curve to optimise well design and improve the overall consistency of our performance at the wellsite."

Halliburton has used Prodigi AB Service in the Permian basin for Primexx Energy Partners, which reduced overall treating pressures, increased consistency of the formation breakdown process and resulted in an immediate improvement in cluster efficiency. Sam Blatt, VP of Operations for Primexx said, "Prodigi AB Service is helping Primexx achieve our execution and production goals. The reduction in treating pressure and operational consistency is allowing us to execute treatments more efficiently, and the improved cluster distribution is helping us make better wells."

Gyro surveying service

SCHLUMBERGER HAS INTRODUCED the GyroSphere MEMS gyro-while-drilling service, which aims to increase drilling efficiency and reliability while reducing drilling risks for global E&P operators. As the first application of microelectromechanical system (MEMS) technology for gyro surveying while drilling in the oilfield, the GyroSphere sensor performs gyro surveys faster than conventional systems and avoids the need for recalibration between runs. Solid-state technology enables the GyroSphere sensor to withstand the downhole shock and vibration that occur during drilling beyond the limits of current gyro technologies. Additionally, the GyroSphere service can reduce gyro survey uncertainty by up to 45 per cent, providing more accurate access to smaller reservoir targets.

"The GyroSphere service substantially improves operational efficiency by enabling gyro surveying without taking any additional rig time," said Tarek Rizk, president, Drilling & Measurements, Schlumberger. "Two surveys can be completed using the GyroSphere service in the same amount of time conventional gyros take to start just one."

The GyroSphere service has been proven through extensive testing and field trials.


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Cutting costs using specification

st nd rdis tion

AkzoNobel's universal pipe coating (UPC) products are designed to reduce complexity and provide specification standardisation, resulting in savings throughout the contract chain.

THE CURRENT OIL and gas market demands cost savings; reduced maintenance budgets, shorter payback periods and increased efficiency have become the 'new normal'. Every part of the process is scrutinised to generate efficiencies and improve overall margins. Traditionally, this analysis manifests as a downwards pressure on suppliers to cut costs, but these pressures do not always help as rising raw material costs, e.g. zinc and epoxy resin, can drive prices higher.

One of the main challenges hindering oil and gas operators from making further cost savings is the enormous complexity associated with oil and gas facilities. Thousands of pipes, valves and vessels are required, operating at many different service temperatures as well as beneath insulation.

However, the complexity as well as change orders and modifications to existing design can cause challenges during the construction phase. Bulk supplied items such as pipes, valves and vessels have long lead times and are usually ordered three years in advance of the project start up. Project detailed design continues over this time and as a result, when items arrive onsite, up to 20 per cent may now be required at different service temperatures to where they were initially planned. Many items are standardised so they can be interchanged easily, however, the coating systems applied to these items are often carefully chosen for a specific operating temperature. The wrong coating at the wrong temperature is a quick route to early failure or production delays costing US$1-2 mn per day. Therefore, onsite rework is required to change the coating, increasing painting costs.

> "The wrong coating at the wrong temperature is a quick route to early failure or production delays"

Image Credit : AkzoNobel

Pipe coatings play a critical role in preventing corrosion

To help reduce the challenge of complexity, many high temperature coatings are specified with a coat of inorganic zinc silicate as a primer, providing ambient temperature corrosion resistance prior to project start up or during ambient temperature use. The topcoat is then applied after the item arrives onsite, ensuring that rework is minimised. However, the rising price of zinc continues to make this a costly solution, and this process also increases paint application costs due to double handling at the paint shop and at site.

Interbond UPC (Universal Pipe Coatings) from AkzoNobel is designed to reduce overall project and painting costs, whilst greatly improving productivity. Carefully formulated to show tolerance to a wide range of service temperatures, the universal pipe coating products are targeted with reducing complexity, providing specification standardisation which leads to cost savings all the way up the contract chain. UPC products are formulated to provide both ambient and high temperature resistance, with tolerance to carbon/stainless steel as well as insulated/uninsulated conditions – this allows them to replace many of the traditional painting systems used.

The UPC range is made up of Interbond 1202UPC and Interbond 2340UPC, two products linked by possessing both high temperature and Corrosion Under Insulation (CUI) resistance alongside excellent ambient temperature resistance as per the ISO20340 ambient temperature anticorrosive test, without a primer. This feature allows a truly universal approach with a simple two coat, direct to metal system, suitable for a wide range of operating environments, greatly reducing the dependence on expensive zinc-based primers. ■

Qualifying real-time bit wear through innovative monitoring of alkenes

GEOLOG DEPLOYED ITS BitLife services with Kuwait Oil Company (KOC) during drilling of deep exploratory HPHT wells in northern Kuwait, where predicting and judging the degree of bit efficiency was a concern. KOC wished to avoid potential NPT (non productive time) arising from loss of the bit or parts of bit in hole, or from drilling under-gauge hole due to excessive bit wear requiring subsequent reaming. A technique was required to qualify the condition of the bit in real-time in order to optimise drilling parameters so as to maintain as efficient drilling as possible, and then objectively justify POOH (pull out of hole) for bit change.

GEOLOG's BitLife service was deployed in a 22" hole section drilling from the Rumaila formation of interbedded carbonate and shales into the Burgan sandstone formation. As drilling continued following formation change bit wear was detected through the increasing presence of alkenes, accompanied by a gradual drop in average ROP from approximately 32ft/hr to below 18ft/hr and an increase in torque from an average of 12kft/lbs to more than 19kft/lbs; bit end-of-life was confirmed on surface by the damaged cutters and under-gauge bit condition.

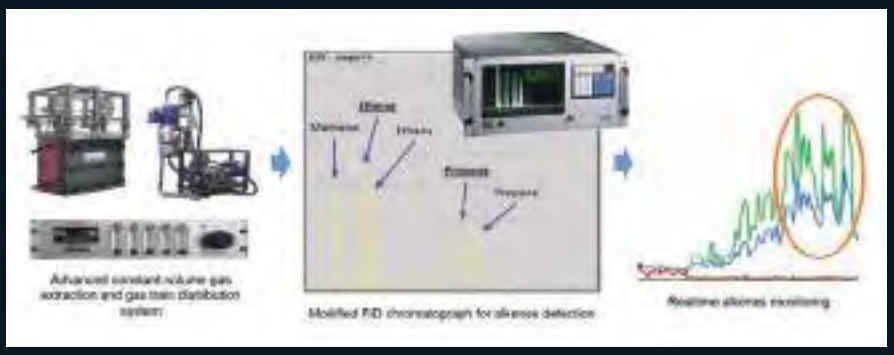

Image credit : GEOLOG

The BitLife services were used to qualify the condition of the bit in real-time

In the 16" hole section, drilling through the Zubair formation to the Minagish and Mahkul carbonates, significant alkenes were detected along with ROP dropping from an average of 25 ft/hr to 12 ft/hr, indicative of increased wear; in response the bit was pulled out of hole and showed a high degree of wear with chipped teeth, but still in gauge, showing the timeliness of the decision to POOH.

The GEOLOG alkene-detection BitLife service was deployed with both water-based mud (WBM) with diesel added and oil-based mud (OBM) drilling fluids. Drilling parameters were optimised to get maximum footage while effective bit cutting action could be seen, and to determine the optimal time to perform a bit trip once bit wear became terminal. This data was successfully utilised to study the efficiency of various bits with different drilling parameters in a variety of drilling conditions.

Allweiler introduces new compact marine centrifugal pumps

ALLWEILER GMBH, PART of CIRCOR International, Inc., has introduced its redesigned vertical centrifugal pump solutions for ship engine rooms. The innovative foot design reduces space requirements and improves operational safety.

"The new compact MA-S and MA-C series are vertically installed centrifugal pumps with axial inlets and radial outlets. The S version was designed for simple and rapid assembly and disassembly of the insert unit with impeller. The C version offers the same reliability with a significantly shorter installation height, so it's perfect for customers with severe space restrictions," says Christian Martin, senior director Product Management.

Imave credit: CIRCOR International

The new compact marine centrifugal pumps

Both versions use a new and patented foot design and have a footprint that is up to 23 per cent smaller than the predecessor model. In this shorter, lighter version, the suction flange was redesigned with integrated fixing holes for pedestal mounting on the ship's foundation.

This arrangement extends the pump's service life and reduces wear to the bearing and shaft seal by directing forces from the pipeline directly into the foundation. It also helps avoid damages at the impeller and casing.

New hand-held combustion emissions analyzer

THE E-INSTRUMENTS E1500 Hand-Held Combustion Emissions Analyzer is a new, rugged unit with the ability to measure CO & O2 from high efficiency and condensing boilers, burners, engines, turbines, kilns, furnaces, incinerators and other industrial combustion processes. Featuring a built-in printer, new large colour display, automatic data saving and expanded internal memory, the E1500 lets you easily see and save your sample data without worrying about running out of memory. The E1500 also features pre-calibrated, field replaceable sensors which allow for easy diagnostics and replacement to reduce "down-time" and costly repair charges, as well as bluetooth wireless communication with software and App.

Strainstall develops wireless monitoring solution

STRAINSTALL HAS PARTNERED with oilfield services company Baker Hughes to pioneer the development of a new wireless monitoring solution, now open to almost all upstream wellsite operations.

Wireline operations

Image credit: Strainstall

Strainstall engineered a 'plug-and-play' system that required no changes to existing sheave arrangements by integrating its highly accurate tension load cells with its hazardous area certified wireless technology, to provide both real-time and built-in data logging capabilities for line tension monitoring. This led to Strainstall's development of a modular, fully hazardous area certified wireless system which could integrate with any type of third party sensor for any application where operator safety is a key concern, without needing IECEx recertification.

Strainstall has now launched its suite of Wellsite Monitoring Solutions (WMS) that address wellsite safety and efficiency issues, initially focusing on wireline, slickline and measurement-while-drilling (MWD) activities. The wireless technology supports wellsite operations by eliminating the use of cabled sensors and removing trip hazards. Significant value is added by reduced rig up time and associated cable costs, as well as reduction of non-productive time (NPT).

WMS replaces existing cabled sensors with highly accurate, hazardous area certified (zone 1/class 1 division 2) wireless sensors that communicate directly with wellsite control, monitoring and data handling systems to provide real-time operational information, as well as storing the data for analysis for potential learning, improvement opportunities and incident investigations. WMS can be easily retrofitted and is compatible with existing wellsite equipment.

New wellhead sealing solution

TRELLEBORG SEALING SOLUTIONS has announced the launch of a new metal end cap seal specifically engineered for High Temperature / High Pressure (HTHP) wellhead tubing and casing hanger sealing environments, which combines the pressure and extrusion resistance of a metal-to-metal bonded component with the flexibility of an elastomer.

Image credit: Trelleborg

The new metal end cap seal

The high performance elastomer-to-metal bonded sealing elements provide the high level of extrusion resistance necessary for high pressure and temperature casing and tubing hanger applications. Combining the range of Trelleborg's proprietary XploR™ Rapid Gas Decompression (RGD) and sour gas resistant elastomers with corrosion resistant metal end caps, Trelleborg Sealing Solutions engineers can design a customised sealing solution to meet specific oilfield requirements.

David Brown, Trelleborg Sealing Solutions global director - lead Group Oil & Gas, said, "High pressure wellhead sealing environments, such as casing strings and tubing hangers, are safety critical applications requiring a robust and capable sealing product. The new metal end cap seal that Trelleborg has developed uses our proprietary and proven XploR™ materials, which provide superior RGD resistance, oilfield fluid compatibility and longevity in HTHP environments. These benefits accelerate the performance of our customer's equipment, allowing them to operate oil and gas equipment with optimal safety and reliability."

Sealing in the elastomer-to-metal design solution is achieved by controlled deformation of the elastomer and metal end cap elements during installation and operation. Optimal stress distribution throughout the elastomer body is modelled through Finite Element Analysis (FEA) to ensure appropriate design standards are applied to each customer's unique application. Extrusion resistance is provided by the specially designed metal end caps that provide positive metal-to-metal sealing interference with the hardware upon assembly and conform to any potential extrusion gaps under pressure.

The metal end cap seal can withstand pressures up to 103.4 MPa/15,000 psi and temperatures up to +177°C/+350°F in static applications. The sealing materials comply with NORSOK, NACE, API and Total standards.

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Cubility launches new version of solids control solution

CUBILITY AS HAS launched the latest evolution of its industry leading solids control solution, the MudCube X.

The MudCube is a compact, lightweight solids control system that eliminates the traditional process of shaking fluids from the drilled solids with the negative HSE impact. It uses a combination of high airflow and a rotating screen filtration system to improve separation efficiency, allowing more drilling fluid to be recycled back to the mud tanks and resulting in dryer cuttings and less waste. This leads to improved drilling efficiencies, reduced operational costs, as well as better HSE and working conditions, according to the company. Building on the capabilities of the MudCube, the MudCube X comes with an enhanced modular design allowing for easy integration into all rig designs; and fast installation and maintenance. It is engineered to allow for local manufacturing and/or assembly worldwide.

Image Credit: Cubility

The MudCube X

Even Gjesdal, Cubility CEO said, "We are enormously proud as to how the MudCube has revolutionised solids control and we look forward to even further market penetration with the MudCube X." With the rise in pad drilling and multiple wells, the MudCube X can be added to existing operations and start delivering value in drilling fluids and waste disposal within a matter of days. Furthermore, as opposed to shakers, the MudCube X processes 100 per cent of the mud, thereby immediately increasing performance with as much as 80 per cent more mud recovered than other technologies. When taking this across a field and hundreds of rigs, the impact on the bottom line and investor returns will be significant.

Over the last few years – both onshore and offshore – the MudCube has won significant contracts in the North Sea, the Middle East, Asia, South America, and the North American land drilling market, where Cubility has developed a major foothold in US shale.

New process heating control system

THERMON GROUP HOLDINGS has introduced the TraceNet Genesis Control & Monitoring System, a new solution for managing heat trace circuit performance on process lines, tanks and instrumentation. It gives instant access to comprehensive heat trace circuit information, including circuit performance history, fault analysis, and circuit drawings. helping maintenance personnel to predict failures and minimise downtime.

"Maintenance personnel must accurately predict and prevent heating system downtime. They require the right information at their fingertips to quickly and accurately troubleshoot issues as they arise," said Peter Baen, senior product manager for Thermon. "In response, we developed the TraceNet Genesis System to be a fully connected Industrial Internet of Things (IIOT) platform for controlling heat trace circuits that provides comprehensive and rich data at the point of use."

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS - SAUDI ARABIA

Project	City	Facility	Budget ($ US)	Status
Advanced Petrochemical Company - Jubail - Pyoil & Pygas Plant	Jubail	Industrial Production	580,000,000	Feasibility Study
Aramco - Berri - Gas-Oil Separation Plant Expansion	Berri	GOSP	1,700,000,000	FEED
Aramco - Duba - Tabuk Refined Products Pipeline	Duba	Multi Products	300,000,000	EPC ITB
Aramco - Manifa Oilfield Upgrade	Manifa	Oil Field Development	500,000,000	Construction
Aramco - Ras Tanura Pipeline	Ras Tanura	Oil	270,000,000	Construction
Farabi Petrochemicals Company - Yanbu Linear Alkyl Benzene (LAB) Plant	Yanbu	Linear Alkyl Benzene (LAB)	450,000,000	Construction
INOCHEM - Soda Ash and Calcium Chloride Complex	Yanbu	Detergents	300,000,000	Construction
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 - Clean Fuel Package	Rabigh	Naptha	950,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 (Overview)	Rabigh	Aromatics	5,000,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Common Facilities (U02) & Tank Farm Package (U03)	Rabigh	Naptha	500,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Clean Fuel - Naphtha Hydrotreater and SRU	Rabigh	Sulphur Recovery	150,000,000	Construction
Petro Rabigh Refinery & Petrochemical Complex Expansion - Phase 2 - Vanadium Processing Plant & Caustic Soda Disposal Unit	Rabigh	Caustic Soda	220,000,000	Construction
RCC - Jubail - Hydrocarbon Resin Complex	Jubail	Hydrocarbon Resin	500,000,000	Feasibility Study
SABIC (JUPC) - Jubail - EO/EG III	Jubail	Ethylene Oxide	700,000,000	Engineering & Procurement
SABIC - ARAMCO - Yanbu - Crude Oil To Chemicals (COTC) Complex	Yanbu	Petrochemical Complex	20,000,000,000	FEED
Sabic - Debottlenecking and Expansion of Petrokemya Butadiene Extraction Plant	Jubail	Butadiene	450,000,000	Construction
SABIC - Jubail Industrial - Corporate Headquarters	Jubail	Commercial Buildings	990,000,000	Engineering & Procurement
SAGIA - Saudi Aramco - Jizan City for Basic & Downstream Industries - Port Dredging and Reclamation Package	Jizan	Port	1,400,000,000	Construction
SASREF - Jubail - Refinery Modernization and Expansion	Jubail	Petroleum Oil Refinery	95,000,000	Engineering & Procurement
Saudi Aramco - Yanbu to North Jeddah NGL Pipeline	Yanbu	Gas	600,000,000	Construction
Saudi Aramco - Annual Onshore Maintain Potential Program (MPP)	Red Sea	Maintenance	5,000,000,000	Construction
Saudi Aramco - Arab Heavy Pipeline to Yanbu Crude Oil Terminal (YCOT)	Various	Oil	250,000,000	EPC ITB
Saudi Aramco - Arabiyah and Hasbah Gas Field Development	Arabiyah	Gas Field	3,000,000,000	Construction
Saudi Aramco - Bapco - AB Pipeline	Abqaiq - Sitra	Oil	350,000,000	Construction
Saudi Aramco - Berri Offshore Pipeline	Berri	Oil	400,000,000	EPC ITB
Saudi Aramco - Duba - Bulk Plant Terminal	Duba	Oil Storage Terminal	400,000,000	EPC ITB
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 - Freeflow Pipelines	Haradh	Flowlines	470,000,000	Construction
Saudi Aramco - Haradh Gas Increment Program - North Haradh Field Gas Compression Facilities	Haradh	Gas Compression	1,200,000,000	Engineering & Procurement

Project	City	Facility	Budget ($ US)	Status
Saudi Aramco - Haradh Gas Increment Program - South Haradh Field Gas Compression Facilities	Haradh	Flowlines	1,200,000,000	Engineering & Procurement
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	Engineering & Procurement
Saudi Aramco - Jizan Export Refinery (Overview)	Jizan	Petroleum Oil Refinery	2,100,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Crude Distillation Unit / Vacuum Distillation Unit, Flare & Pipe Rack Complex	Jizan	Crude Oil Distillation Unit	500,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Hydrocracker Unit	Jizan	Hydrocracker	250,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Marine Terminal Facilities	Bish	Marine Terminal	500,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Sour Water Stripper & Amine Regeneration Unit	Jizan	Oil Production	500,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Tank Farms	Jizan	Oil Storage Tanks	1,500,000,000	Construction
Saudi Aramco - Jizan Export Refinery - Utilities Package	Jizan	Offsites & Utilities	300,000,000	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 - Marjan - Oil Field Expansion	Marjan	GOSP	15,000,000,000	Construction
Saudi Aramco - Marjan Cogeneration Independent Steam and Power Project (ISPP)	Marjan	Co-Generation	500,000,000	EPC ITB
Saudi Aramco - Marjan Water Injection	Marjan	Water Injection	5,000,000,000	EPC ITB
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 - Master Gas System Expansion (MGSE) - Phase II - Package 1 - Western Region Pipeline	Western Region	Gas	830,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 3 - Eastern Region Pipeline	Eastern Region	Gas	374,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) - Phase II - Package 2 - Central Region Pipeline	Central Region	Gas	367,000,000	Construction
Saudi Aramco - Master Gas System Expansion (MGSE) Phase II - Booster Compressor Stations	Dammam	Compressor Station	800,000,000	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 - Shedgum to Yanbu Natural Gas to Liquids (NGL) Pipeline (SHY 1 Loops 4 & 5)	Shedgum	Liquefied Petroleum Gas (LPG) Pipeline	500,000,000	Construction
Saudi Aramco - Total - Satorp - Jubail - Petrochemicals Complex	Jubail	Petrochemical Plant	9,000,000,000	Feasibility Study
Saudi Aramco - Unconventional Gas Program - Shale Gas Production	Various	Shale Gas	7,000,000,000	Engineering & Procurement
Saudi Aramco - Unconventional Gas Program - Tight Gas Production Systems A	Turaif	Gas Field Development	200,000,000	Construction
Saudi Aramco - Unconventional Gas Program - Tight Gas Production Systems A and B (Overview)	Turaif	Gas Field Development	3,500,000,000	Construction
Saudi Aramco - Unconventional Gas Program - Tight Gas Production Systems B	Turaif	Gas Field Development	800,000,000	Construction
Saudi Aramco - Uthmaniya Gas Treatment Units	Uthmaniyah	Gas Network	800,000,000	Construction
Saudi Aramco - Yanbu - Storage Tanks and Associated Equipment	Yanbu	Gas Storage Tanks	270,000,000	Engineering & Procurement
Saudi Aramco - Zuluf Oilfield Expansion	Zuluf	Oil Processing Facility	1,700,000,000	Engineering & Procurement
Saudi Kayan - Jubail - EO/EG Debottlenecking	Jubail	Ethylene Oxide	120,000,000	Construction
SDC - Jubail - Surfactants Manufacturing Plant	Jubail	Surfactants	50,000,000	FEED
Yansab - Yanbu - Ethylene Glycol DBN	Yanbu	Ethylene Glycol	100,000,000	Construction

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Project Databank

Compiled by Data Media Systems

Project Focus

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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
Facility Type	Gas Compression
Status	Construction
Location	Haradh
Project Start	Q1-2014
End Date	Q2-2021
FEED	WorleyParsons
EPC Contractora	Tecnicas Reunidas, Saipem, China Petroleum Pipeline Engineering Company – CPPE, Tekfen
Award Date	Q4-2017

Background

Saudi Arabia plans to raise its gas production to be able to diversify its energy mix. The demand for natural gas is on the rise in the kingdom 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. The capacity of Hawiyah plant will also be expanded by 1.3bn standard cubic feet per day. Hawiyah and Haradh are part of Ghawar, the world's largest onshore oilfield.

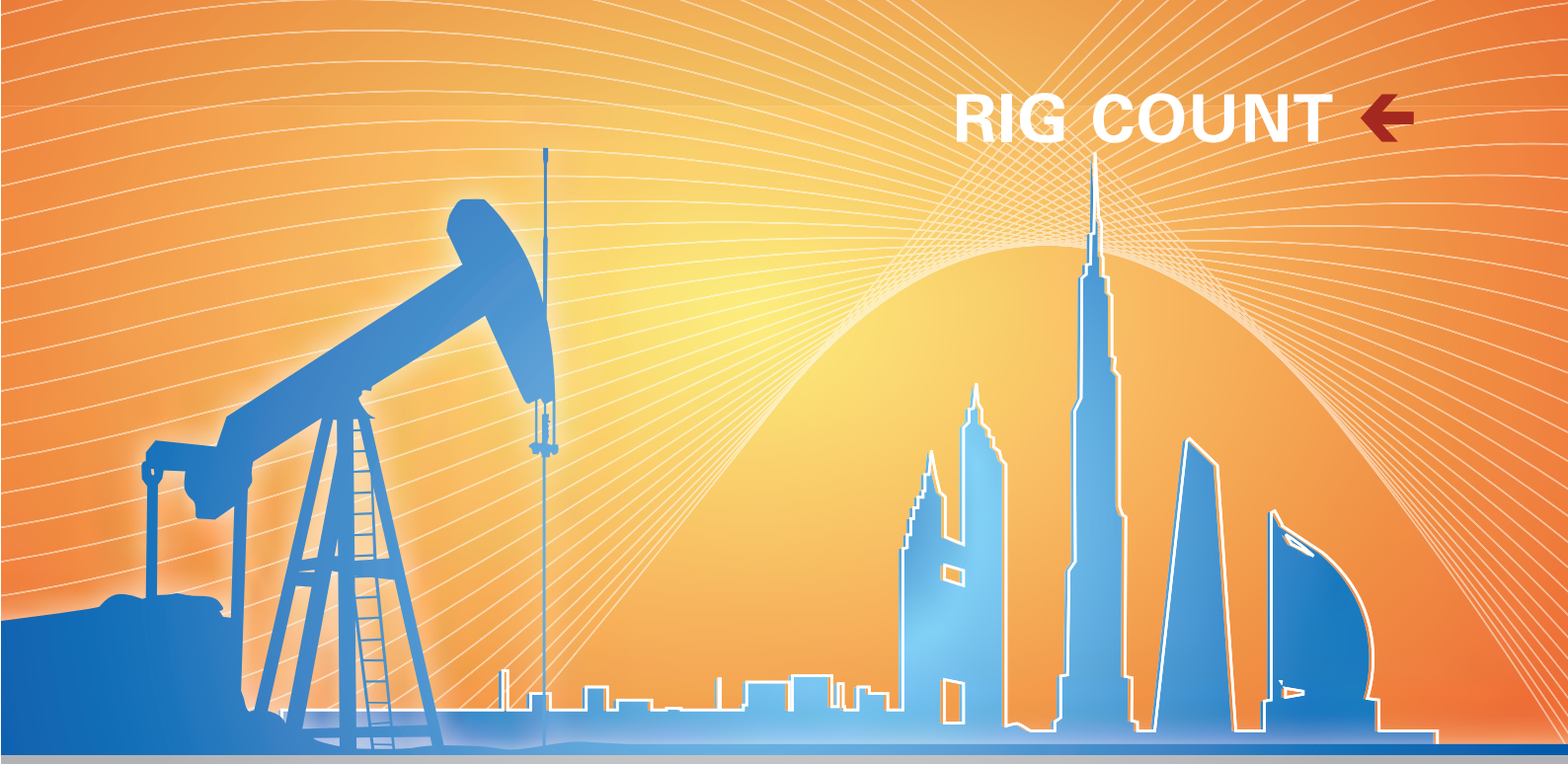
Project Status

Date	Status
31 Jul 2018	Saudi Aramco signs a $US590mn construction agreement with Tekfen to build Haradh's satellite gas compression plant pipelines. The duration of the project is 33 months.
29 Jul 2018	Aramco awards Saipem a contract for the construction of its South Gas Compression Plant Pipelines. The project is interconnected with the development of Haradh Gas Plant and will feature the development of a 700-km long system of pipelines, flow lines, trunk lines, transmission lines and associated facilities to transport gas from points of storage and distribution.
12 Jul 2018	Aramco awards China Petroleum Pipeline Engineering Company, a subsidiary of China National Petroleum Corporation, a US$569.35mn contract to build an 844 km pipeline for Haradh Field. The project is expected to be complete within 38 months.
Jul 2018	Field layout and schematic design for the pipeline connection of the North, South and Satellite gas compression facilities have been completed and bids for the LSPB contract are currently being evaluated for pipeline modifications and material provision.

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.



Middle East & North Africa

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

	THIS MONTH			VARIANCE	LAST MONTH			LAST YEAR		
Country	Land	OffShore	Total	From Last Month	Land	OffShore	Total	Land	OffShore	Total
Middle East										
ABU DHABI	38	17	55	2	38	15	53	34	18	52
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	57	0	57	-2	59	0	59	53	0	53
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	50	0	50	0	50	0	50	52	0	52
OMAN	53	0	53	0	53	0	53	53	0	53
PAKISTAN	24	0	24	1	23	0	23	25	0	25
QATAR	4	5	9	0	4	5	9	4	6	10
SAUDI ARABIA	100	21	121	4	100	17	117	98	17	115
SUDAN	0	0	0	0	0	0	0	0	0	0
SYRIA	0	0	0	0	0	0	0	0	0	0
YEMEN	0	0	0	0	0	0	0	0	0	0
TOTAL	326	45	371	5	327	39	366	319	43	362
North Africa										
ALGERIA	49	0	49	4	45	0	45	55	0	55
EGYPT	24	5	29	-3	26	6	32	18	6	24
LIBYA	7	1	8	3	4	1	5	0	1	1
TUNISIA	2	1	3	0	2	1	3	0	0	0
TOTAL	82	7	89	4	77	8	85	73	7	80

Source: Baker Hughes

بالإضافة إلى ذلك، منحت التغطية السيزمية ثلاثية الأبعاد للحقول البحرية اللبنانية (٨٠ في المائة) الشركات فرصة فريدة للحد من المخاطر المرتبطة بأعمال التنقيب المزمع استكشافها واختيار تلك التي من المرجح أن تُكلل بالنجاح.

• هل لديكم خططٌ لمنح مجموعة تراخيص ثانية؟ وهل بوسعكم تقديم أي مؤشرات على توقيت حدوث ذلك؟ وكيف تتطلعون لجذب اهتمام الشركات للمشاركة في المناقصات؟

■ بالطبع لدينا خطط. فقد قررت الحكومة في شهر مايو/أيار من العام الحالي إطلاق جولة التراخيص الثانية قبل نهاية العام وخلال ٢٠١٩ (من المتوقع منح الامتيازات قبل نهاية ٢٠١٩ إذا تسنّى لنا اختصار الإطار الزمني المتوقع).

وفيما يلي المراحل الرئيسية للجولة الثانية:

أ- جولة التأهيل المسبق (ثلاثة أشهر من البداية وحتى الإغلاق): من المقرر البدء فيها قبل نهاية عام ٢٠١٨، على أن يتم الإعلان عن التاريخ الفعلي في وقت لاحق خلال هذا الصيف.

ب- إتاحة تقديم العطاءات للشركات مسبقة التأهيل لمدة ستة أشهر.

ج- تقييم العطاءات وإرسال تقرير إلى وزير الطاقة والمياه (في غضون شهر واحد).

د- مراجعة الوزير ومجلس الوزراء لتقرير إدارة قطاع البترول اللبنانية ومنح مجلس الوزراء لمنطقة (مناطق) الامتياز (في غضون شهر واحد).

ونحن نقوم بالإعداد لحملة ترويجية وتسويقية، كما ستتم إضافة حوافز أخرى لشروط العطاء وإزالة الكثير من العوائق التي تحول دون تقديم العطاءات. كما أننا أيضا بصدد تقديم دراسات جيولوجية إضافية تسهم في الحد من المخاطر المرتبطة بأعمال التنقيب والأبحاث الجيولوجية، ومن ثم زيادة جاذبية العروض.

• ما هي الفرص المتاحة للشركات الدولية في قطاع النفط والغاز اللبناني حسبما يتراءى لكم؟ وكيف تتطلعون إلى خلق بيئة مواتية للاستثمار الدولي؟

■ تكمن الفرص الحالية بقطاع النفط والغاز في سلسلة القيمة بالكامل (قطاع التنقيب والإنتاج، قطاع النقل وخطوط الأنابيب، وقطاع الصناعات التحويلية) وهي على النحو التالي:

أ- قطاع التنقيب والإنتاج: مع الإغلاق الناجح للجولة الأولى من تراخيص الحقول البحرية ومنح منطقتي امتياز لعدد من الشركات الدولية الكبرى، ومع بدء الجولة الثانية، يطمح لبنان إلى جذب الشركات الرئيسية الكبرى القادرة على العمل في المياه العميقة، وتلك التي تمتلك الإمكانات المالية اللازمة لتتبع وتطوير أي كشف تجاري بشكل سريع. ويتم كل ذلك في إطار قيود بيئية صارمة لتفادي وقوع أي حوادث تهدد الصحة والسلامة والبيئة.

ب- قطاع النقل وخطوط الأنابيب وقطاع الصناعات التحويلية: طرحت وزارة الطاقة والمياه مناقصة دولية من المقرر إغلاقها في أكتوبر/ تشرين الأول، وهي تهدف إلى جذب مقدمي العطاءات من مختلف الدول لإنشاء وحدتين عائمتين للتخزين وإعادة الغاز إلى حالته الغازية، وذلك من أجل توفير وتخزين الغاز الطبيعي المُسال على سفينتين وإنشاء كافة خطوط الأنابيب والبنية التحتية اللازمة لتوصيل الغاز إلى محطات توليد الطاقة التي تعمل بالغاز، وهو ما يؤدي بدوره إلى تقليل تكاليف استهلاك الطاقة التي تتكبدها الدولة بنحو مليار دولار سنويا على وجه التقريب.وقد ثبتت أهلية أغلب الشركات المهتمة بقطاع التنقيب والإنتاج واهتمامها بهذه المناقصة.

ومن الجدير بالملاحظة، أن الإطار القانوني والمؤسسي لقطاع النفط والغاز اللبناني يتميز بالوضوح والاستقرار والقدرة على التنبؤ، مع التركيز بشكل أساسي على الشفافية والاتصال المتبادل مع الشركات الدولية. فقد نشرنا على سبيل المثال سيناريوهات تقييم المناقصة والمنهجية التفصيلية لذلك، ما كان من شأنه بعث رسائل الاطمئنان للشركات والتأكيد على موضوعية التقييم (لا يتحقق ذلك في أغلب جولات الترخيص على مستوى العالم). وقد نال ذلك استحسان وإشادة كل من مبادرة الشفافية في الصناعات الاستخراجية، ومبادرة إدارة الموارد الطبيعية، هذا فضلا عن الشركات.

• ما هو دور الشركات المحلية في تطوير قطاع النفط والغاز اللبناني؟

■ وفقا لدراسة حديثة أُجريت عن السوق اللبناني، سيكون للشركات اللبنانية دور يتزايد تدريجيا على صعيد صناعة الخدمات بشكل رئيسي. وأظهرت الدراسة أنه سيتم استيراد أكثر من ٩٥ في المائة مبدئيا من العناصر المرتبطة بالنفقات الرأسمالية، في حين يتم استيراد ٨٠ في المائة مبدئيا من الخدمات المطلوبة والناتجة ذات الصلة بالنفقات التشغيلية. ويمكن للشركات اللبنانية الاستحواذ على واحد أو اثنين في المائة من حصة النفقات الرأسمالية في السوق على أساس سنوي بعد التطوير، لتصل هذه النسبة إلى ٥٠ في المائة من حصة السوق الكلية بعد ٢٠ سنة (تتطلب الحصص الإضافية من السوق استثمارات ضخمة وتقنيات متطورة ليست متاحة للسوق المحلية بما يمكّنها من منافسة الشركات الدولية العريقة).

أما عن عناصر النفقات التشغيلية، فيمكن للشركات المحلية الاستحواذ على نسبة خمسة في المائة إضافية من حصة السوق من خدمات النفط والغاز والمساهمة بنسبة ٨٠ في المائة من قطاع الخدمات بعد ١٢ عاما تبدأ من اليوم (أي من بدء التنقيب).

• على المدى البعيد، كيف تتطلعون لاستغلال موارد النفط والغاز اللبنانية لصالح الدولة وشعبها؟

■ إن أولى الخطوات المنطقية قبل إدارة الإيرادات هي تقييم الموارد. وتقييم الموارد عملية مستمرة، غير أنه تتوفر لدينا بعض النتائج الإرشادية بعد مرور عدة سنوات على أعمال الاستكشاف. وبعد إجراء التقييم الأولي للموارد المتاحة، يمكننا فقط حينذاك تطوير إستراتيجية لإدارة الإيرادات لتحقيق الاستدامة والنمو الاقتصادي.

ويتعين في الوقت الحالي إيداع أي إيرادات للنفط والغاز في أحد صناديق الثروة السيادية (عملًا بالقانون ٢٠١٠/١٣٢). وقد بدأ مجلس النواب في دراسة مسودة قانون بهدف إنشاء صندوق ثروة سيادية. وكما ذكرت سلفا، فإننا سنتمكن من وضع إستراتيجية استثمارية لهذا الصندوق فقط بعد إجراء التقييم الأولي للموارد. والهدف الرئيسي من بنية صندوق الثروة السيادية هذا هو التأكد من تحويل الأصول الهيدروكربونية،غير المتجددة والكامنة في باطن الأرض، إلى أصول مالية مستدامة فوق سطح الأرض، وعدم منح أي جيل بعينه الحق في استنزاف هذه الأصول.

بدأ لبنان في التنقيب عن النفط والغاز في الحقول البحرية

مستقبل تطوير قطاع النفط والغاز في لبنان

يستهل لبنان أعمال التنقيب عن النفط والغاز بإصدار جولة التراخيص الأولى لحقلين بحريين، وفي هذا الحوار يتولى وسام شباط، رئيس وحدة الجيولوجيا والجيوفيزياء بهيئة إدارة قطاع البترول اللبنانية، شرح خطط وآفاق قطاع النفط والغاز في الدولة. وهو يقول إن لبنان يطمح إلى جذب الشركات الرئيسية الكبرى القادرة على العمل في المياه العميقة، وتلك التي تمتلك الإمكانات المالية اللازمة لتتبع وتطوير أي كشف تجاري بشكل سريع. ويتم كل ذلك في إطار قيود بيئية صارمة لتفادي وقوع أي حوادث تهدد الصحة والسلامة والبيئة. وإلى نص الحوار:

• ما هي تطلعاتكم فيما يتعلق بعمليات التنقيب في منطقتي الامتياز ٤ و٩ والتي يجريها تحالف الشركات بقيادة شركة توتال؟ وما الدلائل على الطاقة الإنتاجية؟

■ كنا نسعى من خلال الجولة الأولى من التراخيص لتحقيق هدفين تحققا بالكامل من خلال منح ترخيصين حصريين للتنقيب عن النفط في منطقتي الامتياز ٤ و٩. الهدف الأول هو تحقيق الاكتشاف التجاري، والهدف الثاني المحافظة على حقوق لبنان المتمثلة في السيادة على المنطقة الاقتصادية الخالصة التابعة لها، ولا سيما حدود هذه المنطقة. ومن هذا المنطلق، تعتقد الشركات -كما نعتقد نحن أيضا- أن منطقتي الامتياز ٤ و٩ تتمتعان بارتفاع احتمالات نجاح عمليات التنقيب عن النفط بناءً على البيانات الجيولوجية، وليس هذا فقط، إذ إن هناك العديد من الفرص الأخرى التي تلوح في الأفق وتعد أهدافا للتنقيب. وتحتوي كلتا المنطقتين على تكوينات الحجر الرملي (ناشئة عن الترسبات العكرة) وتكوينات الكربونات. وقد ثبت أن هذين النوعين من الأحجار لهما نظامٌ نفطيٌّ فاعلٌ في منطقة شرق المتوسط.

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العدد السادس 2018

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