www.oilreview.me

UK £10, USA $16.50

Oil Review Middle East

Oil · Gas · Petrochemicals

VOLUME 22 | **ISSUE 1 2019**

What lies ahead for the OIL MARKET?

- Drilling automation solutions
- The evolving oil and gas job market
- Complete lifetime efficiency for offshore terminals
- Advanced surface logging for well placement
- The latest in gas detection
- Bolted joint integrity

22 Years Serving the regional oil & gas sector since 1997

KAESER KOMPRESSOREN

Maximum Quality and Reliability

for the Oil & Gas Industry

KAESER instrument air skid packages provide users with a dependable, efficient and continuous supply of high quality compressed air – even under the toughest conditions.

MOBILAIR M 500-2 – The king of portable oil-free compressors

Under the hood of this two-stage dry-running rotary screw compressor hides the very latest compressed air technology and, as you'd expect from KAESER, it combines exceptional powerful and versatility with environmentally responsible design. The M 500-2 comes as standard with a spark arrestor and motor shutoff valve for installation in refineries and is mounted on a supporting chassis with parking brake so that it can be quickly and safely positioned anywhere. Furthermore, it is a perfect team player and can be easily integrated into compressor stations.

Variable FAD: 28.8 up to 45.8 m³/min, variable pressure: 4.0 up to 10.3 bar

Kaeser Kompressoren FZE
P.O. Box 17485 – Jebel Ali Free Zone – Dubai – United Arab Emirates – Tel: +971 4 805 0000 – Fax: +971 4 805 0077
E-Mail: info.dubai@kaeser.com – www.kaeser.com

Oil Review Middle East
Oil · Gas · Petrochemicals

Alain Charles Publishing
Serving the world of business

Editor: Louise Waters - louise.waters@alaincharles.com

Editorial and Design team: Prashanth AP, Miriam Brtkova Praveen CP, Manojkumar K, Nonalynka Nongrum, Samantha Payne Rahul Puthenveedu, Rhonita Patnaik and Deblina Roy

Managing Editor: Georgia Lewis

Publisher: Nick Fordham

Sales Director: Michael Ferridge

Group Magazine Manager: Graham Brown
+971 4 448 9260
graham.brown@alaincharles.com

Magazine Sales Manager: Tanmay Mishra
+91 80 65684483
tanmay.mishra@alaincharles.com

International Representatives

Nigeria **Bola Olowo**
+234 8034349299
bola.olowo@alaincharles.com

USA **Michael Tomashefsky**
+1 203 226 2882 +1 203 226 7447
michael.tomashefsky@alaincharles.com

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

Middle East Regional Office:
Alain Charles Middle East FZ-LLC
Office L2-112, Loft Office 2, Entrance B,
P.O. Box 502207, Dubai Media City, UAE
+971 4 448 9260, +971 4 448 9261

Production: Srinidhi Chikkars, Eugenia Nelly Mendes and Infant Prakash
production@alaincharles.com

Subscriptions: circulation@alaincharles.com

Chairman: Derek Fordham

Printed by: Buxton Press

Printed in: January 2019

 ISSN: 1464-9314

abc

www.oilreview.me
email: orme@alaincharles.com

Editor's note

WHAT LIES IN store for the oil market and the industry in 2019? That's a question we may well ask after seeing the oil price tumble from the mid-eighties to the mid-fifties in the space of a couple of months at the end of 2018. As economist Moin Siddiqui comments in his article on p12 which looks at the outlook for the oil market, "There are plenty of variables that could yet fuel more unwelcome oil market volatility."

As far as the MENA region is concerned, gas development will be a strong focus in 2019 in the bid to satisfy regional demand (p16-18), with Egypt fast emerging as regional hub for LNG trading (p11). It is encouraging that a newly released survey from DNV GL finds increased confidence about MENA growth prospects (p19).

Elsewhere in this issue, topics covered range from offshore construction to advanced surface logging and gas detection.

Contents

Back cover image courtesy of Saudi Aramco

➔Executives' Calendar 2019

FEBRUARY			
11-13	**Egypt Petroleum Show**	CAIRO	www.egyps.com
18-20	**2nd WPC Leadership Forum**	MUMBAI	www.wpcleadership.com
19-21	**Petro Environment 2019**	AL KHOBAR	www.petroenvironment.com
26-28	**ME-TECH 2019**	ABU DHABI	www.europetro.com/events
26-28	**IP WEEK**	LONDON	www.ipweek.co.uk
MARCH			
5-6	**Saudi Downstream Forum**	YANBU	www.saudidownstream.com
5-7	**Middle East Electricity (MEE) 2019**	DUBAI	www.middleeastelectricity.com
18-21	**MEOS**	MANAMA	www.meos19.com
25-26	**Gulf Safety Forum**	MANAMA	www.europetro.com
27-28	**OpEx MENA 2019**	MANAMA	www.europetro.com
27-29	**OMC**	RAVENNA	www.omc2019.it
APRIL			
2-4	**Lebanon Int'l Oil & Gas Summit**	BEIRUT	www.liog-summit.com
8-9	**Annual Middle East Petroleum & Gas Conference**	DUBAI	www.mpgc.cc
28-2 May	**SOGAT**	ABU DHABI	www.sogat.org
MAY			
1-4	**Iran Oil Show**	TEHRAN	www.iran-oilshow.ir
6-9	**OTC**	HOUSTON	www.2019.otcnet.org

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

IP Week brings together senior executives from around the world

HOSTED BY THE Energy Institute and put together by leading industry experts, International Petroleum (IP) Week is one of the biggest events in the oil and gas calendar. More than 1,500 senior executives from all over the world will gather in London for three days of conferences, seminars, round tables and social events, bringing together the knowledge, experience and expertise of the most senior figures from across the energy world.

Attend to hear the latest news and updates, debate critical issues, share new ideas and network to form partnerships with oil and gas operators, clients and investors.

Topics range from upstream and downstream oil and gas, technology, finance and investment, to specific regions.

This year shines a spotlight on the themes shaping the current global oil and gas markets and investment: geopolitics, sustainability and technology.

A diverse line-up from the international oil and gas industry is confirmed, including HE Suhail Al Mazrouei, Minister of Energy & Industry, United Arab Emirates, Bob Dudley, chief executive, BP, Amin Nasser, president and CEO, Saudi Aramco, Dr Pratima Rangarajan, CEO, OGCI Climate Investments, Andy Brown, Upstream director, Shell, Arnaud Breuillac, president, Exploration and Production, Total, and Datuk Mohd Anuar Taib, executive vice president and CEO Upstream, Petronas.

Image Credit: Energy Institute

UAE Minister of Energy, HE Suhail Mohamed Faraj Al Mazrouei, spoke at last year's event and will return this year.

The event will include a Middle East Summit on 28 February examining the outlook for the Middle East oil and gas industry, as well as its critical role as a demand and supply hub.

IP week is held from 26-28 February at InterContinental Park Lane, London.

For further information see the website at www.ipweek.co.uk.

MSA
The Safety Company

M1

YOUR SCBA PLATFORM FOR THE FUTURE

The new M1 is MSA's most advanced, ergonomic and modular SCBA.

Designed with you in mind, the M1 brings you:

- ✓ Greater modularity
- ✓ Future-ready field upgrade
- ✓ Enhanced hygiene
- ✓ Improved ergonomics and comfort
- ✓ Reduced cost-of-ownership
- ✓ State-of-the-art communication

INTERESTED IN A DEMO?

Visit MSAsafety.com/M1

Connect with us on facebook.com/MSAsafetyFire to always be informed about our latest product news.

WARRANTY 10 YEAR WARRANTY

TOGETHER AS ONE

Shining the light on opportunities to meet soaring power demand

MIDDLE EAST ELECTRICITY, the region's leading international trade event for the power industry, is readying for the biggest industry gathering in the event's history as the most recognised names in the Middle East and North Africa (MENA) power sector, energised start-ups and trailblazing national delegations demonstrate the latest trends and technological breakthroughs to meet fast-growing demand for electricity, diversification and conservation.

Image credit: Informa

The event takes place against the backdrop of increased regional power demand.

The annual event, which combines five dedicated shows within a single exhibition, will run at Dubai World Trade Centre from 5-7 March, 2019 against a backdrop of increasing regional power demand, keen investor appetite and shifting industry dynamics which see renewables rising up the agendas of governments across the region and beyond.

The unprecedented demand for power will see industry players, large and small, new starters and established leaders, utilising the unique platform of Middle East Electricity 2019 to engage visitors in game-changing, across-the-board opportunities throughout the show's five focused sectors: power generation; transmission and distribution; lighting; solar and energy storage and management.

"Massively upscaled demand, supply diversification and conservation have helped to create enhanced opportunities for industry players and boosted the potential of the region's power industry," explained Claudia Konieczna, exhibition director – Informa Industrial Group. "Analyst expectations for the region put the exhibition in the top global league of power investment, which explains why international interest in the show keeps rising annually."

The Arab Petroleum Investment Corporation (APICORP) estimates that between now and 2022, MENA power capacity will expand by an average of 6.4 per cent per year, corresponding to additional capacity of 117 gigawatts (GW) and sector investment of US$260bn. Of the investment total, US$152bn is expected to be allocated for generation with US$108 bn going into transmission and distribution (T&D).

The region's major focus on renewables and advanced technology solutions, including smart grids, for which the Northeast Group forecasts MENA investment will reach US$17.6bn by 2027, has opened the sector to huge end-to-end transformation. Informa believes the seismic shift will be evident among the more than 1,600 exhibitors from 131 countries due to take to the 2019 exhibition floor.

"All aspects of the industry will be represented, and we anticipate serious technological breakthroughs taking centre stage," explained Konieczna.

For further information see www.middleeastelectricity.com

Promoting environmental sustainability

HELD UNDER THE patronage of HRH Prince Saud bin Nayef bin Abdulaziz Al Saud, Governor of the Eastern Province, under the theme Innovative Technologies for Environmental Sustainability, PetroEnvironment 2019 – the 9th Symposium on Environmental Progress in the Petroleum and Petrochemical Industry offers an unrivalled opportunity for the global oil and gas, petrochemical and environment community to come together and focus on the future of environmental sustainability.

Under the auspices of ETMA (Environmental Technology & Management Association), led by Principal Sponsor Saudi Aramco, PetroEnvironment 2019, which takes place from 19-21 February 2019, at the Seef Center in Al Khobar, Saudi Arabia, is a unique three-day gathering of environmental practitioners, policy makers, scientists end users, technicians and engineers offering an unrivalled combination of technical and commercial content and attracting senior influencers worldwide.

The forum features an industry showcase exhibition dedicated to environmental progress in the upstream and downstream industry, featuring game-changing innovations and technological advances.

The PetroEnvironment symposium explores in detail a range of topics pertaining to the effective operation and management of environmental considerations within the petroleum and petrochemical industries. Developed by the technical committee, which is formed of environmental experts from Saudi Aramco, the General Authority for Environmental Protection, King Fahd University for Petroleum and Mineral Resources, Prince Mohammed University and Imam Abdulrahman Bin Faisal University, the programme will cover topics such as air quality, water and wastewater, biodiversity, naturally occurring radioactive materials, clean fuels, crisis management and emergency response, industrial and hazardous waste, marine protection, oil spill, laws and regulation and industrial hygiene.

For further information see www.petroenvironment.org

Meeting place for the downstream industry

ME-TECH, THE PREMIER technical downstream event for the Middle East, will take place from 26-28 February in Abu Dhabi, with ADNOC as strategic partner.

Now in its ninth successive year, ME-TECH continues to attract the best of the downstream sector, bringing together senior representatives and specialists from regional end-user companies with the leading licensors, technology companies and innovative service and solutions providers. The aim is to share the latest projects, discuss market trends and the challenges and opportunities that come with them, as well as become updated about the latest technological advances which will drive the refining and petrochemicals industries towards greater growth and efficiency.

Image credit: Shutterstock

The event will provide a platform to discuss the latest technological developments in the downstream industry.

The event will feature high-level strategic keynote speeches by end-users and NOCs, macro-economic scene-setting overviews from industry experts discussing the future of the industry, interactive panel discussions on topical subjects and technical presentations from technology companies and solution providers.

ME-TECH has proved to be the essential meeting place for the Middle East downstream industry and an excellent platform to keep up-to-date with developments in this important region.

Topics include major project updates from key regional producers; increased integration between refining and petrochemicals; development of Crude to Chemicals technology; options for maximising conversion and meeting evolving demand; clean fuels and latest innovations in catalysts; specialty petrochemicals technologies; feedstock diversification and alternative routes; and the latest in advanced olefins and polyolefins technologies.

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

Saga PCE

Primary Cementing Equipment
Liner Hanger Equipment & Services
Inflatable Packers
Well Testing Services
Saga-Lancaster Chokes

Compact, Robust and Reliable Production Chokes from SAGA-Lancaster

Production chokes play a critical role in the safe and economical delivery of the worlds oil and gas reserves. The demands of modern-day oilfield production dictate that safety and reliability is paramount.

For over 20 years, SAGA-Lancaster Flow Automation have designed and manufactured a high-performance production choke, specifically engineered to process aggressive fluids composed of sand and other solid particles.

Our engineering and manufacturing processes are characterized by our commitment to innovation. Our testing and research produce important information, but our best feedback comes from our customers.

The advances in our production chokes reflect the need to accommodate increasing operating pressures while delivering outstanding efficiency and reliability.

We've designed a long list of important advances in our chokes. For example, our equipment requires extremely low operating torque; our stainless operating lever is only 7.5-inches long. There's no need for large hand wheels or additional personnel.

Automation is really simple with a lightweight, low-powered actuator that can be installed while the choke is in service. Any type or brand of actuator is compatible, regardless of the trim type.

A tungsten-carbide trim is standard, however we offer multiple trim types with a single configuration bonnet and body. All seat assemblies utilize a non-threaded design that cannot be loosened from flow-induced vibration; which means there are no seat-to-body seal failures and body damage.

All of our choke bodies are forged and have a reinforced inlet nozzle area and large body reservoirs that reduce internal erosion and extend the trim life span. Our superior manufacturing processes deliver improved corrosion resistance of the standard stainless steel trim components and superior seal performance.

SAGA-Lancaster has manufacturing facilities in Houston, Texas and Samarinda, Indonesia. And, we have a service facility in Abu Dhabi in the UAE.

To learn more information about SAGA-Lancaster Chokes, contact sales@sagapce.com

Singapore, Indonesia, U.S.A., Australia, Oman, UAE

Saipem wins two EPIC contracts from Saudi Aramco

SAIPEM HAS BEEN awarded two engineering, procurement, installation and construction (EPIC) contracts by Saudi Aramco to develop offshore fields in Berri and Marjan, located in the Gulf.

The contract, worth US$1.3bn, is part of the long-term agreement for offshore activities in Saudi Arabia, which will be in force until 2021, Saipem stated in a statement.

Image credit: Toxic Web/Flickr

Saipem activities will include the design, engineering, procurement, construction, installation and implementation of subsea systems.

Saipem activities will include the design, engineering, procurement, construction, installation and implementation of subsea systems, as well as the laying of pipelines, subsea cables and umbilicals, platform decks and jackets.

Saipem is one of the leaders in drilling services, as well as in the engineering, procurement, construction and installation of pipelines and complex projects, onshore and offshore, in the oil and gas market.

Saudi Arabia to support South Africa's oil industry

SAUDI ARABIA HAS plans to invest US$10bn in South Africa through the construction of an oil refinery and petrochemicals plant, according to Khalid Al-Falih, Saudi Arabia's energy minister.

After meeting with South African energy minister Jeff Radebe in Pretoria, Al-Falih stated that the planned refinery is expected to be run by Saudi Aramco and would use Saudi oil.

"There have been exchanges of talks by Saudi Aramco teams and they have been supported by the South African Energy Ministry," Al-Falih noted.

Radebe stated that the exact location of the refinery and petrochemicals plant will be finalised in the coming weeks.

"Saudi Aramco and South Africa's Central Energy Fund are moving forward with the feasibility study and identifying the parameters of the project," Falih concluded.

Ministers Jeff Radebe and Khalid Al-Falih have also signed a Memorandum of Understanding (MoU) to cooperate on oil and gas undertakings in both countries.

Also discussed was the possibility of Saudi Aramco using tanks at the strategic location of Saldanha Bay to store crude oil.

Borouge awards contract to ADNOC Logistics & Services

BOROUGE HAS AWARDED ADNOC Logistics & Services (ADNOC L&S) a three-year contract to transport 11mn tonnes of polymers from its Ruwais container terminal to Khalifa and Jebel Ali Ports.

The contract recognises the diverse capabilities of ADNOC L&S and strengthens partnership with Borouge to support the expansion of activities at its Ruwais terminal.

Image credit: ADNOC

The agreement will see the transportation of more than 11 million tonnes of polymers over three years.

In May 2018, ADNOC L&S signed a five-year agreement with Borouge for the management of its cargo handling at the terminal of up to 800,000 Twenty-foot Equivalent Units (TEUs) per annum, requiring a broad range of services, from skilled labour and management expertise, together with safety and operational excellence.

"This is the second cooperation of its kind between Borouge and ADNOC L&S in which we have entrusted the handling operations of our shipping cargo at the Ruwais container terminal," said Ahmed Omar Abdulla, CEO of Abu Dhabi Polymers Company (Borouge).

"This represents another developmental milestone for Borouge and a successful step towards strengthening our supply chain activities, to ensure the best and safe delivery of our products to customers around the world."

Eni's aggressive Middle East strategy

ITALY'S ENI SCORED several Middle East oil and gas successes in January. It won three exploration and development concessions for onshore oil and gas fields in Sharjah in partnership with Sharjah National Oil Corporation, and signed an MoU with the National Oil & Gas Authority of Bahrain (NOGA) for the exploration of the largely unexplored offshore Block 1. Together with BP, Eni signed a Heads of Agreement (HoA) with Oman's Ministry of Oil & Gas to pursue the award of a new exploration and production sharing agreement (EPSA) for Block 77 in central Oman.

Will Scargill, oil and gas analyst at GlobalData, commented, "Eni's recent acreage captures in the Gulf are part of a strategy for major growth in the Middle East. Over the past two years, the company has acquired major development and production assets, and these new exploration licenses will make it a key player in the region's exploration in the coming years.

"In March 2018, Eni announced its acquisition of interests in the producing Lower Zakum and Umm Shaif and Nasr concessions in the UAE. Combined with an increase in production from the Zubair field in Iraq – Eni's only pre-existing production asset in the region – we expect these acquisitions to drive strong production growth."

Eni's Middle East production in 2018 is estimated to have been more than double the 2017 figure, with a further 20 per cent growth expected in 2019, according to GlobalData.

"On top of these production acquisitions, Eni has also secured a 25 per cent interest in the UAE's Ghasa sour gas development. This will add further production when the fields come on stream, expected in 2022-23," continued Scargill. "Eni will hope to secure longer-term production growth in the region through its new exploration acquisitions. Such intentions were already shown by the acquisition of Block 52 offshore Oman in 2017 and the company's unsuccessful bidding for two blocks in last year's Iraqi bid round. The new blocks in Bahrain, Oman and the UAE will make it a major acreage holder in the region.

"Operational synergies resulting from a concerted regional growth strategy may also benefit Eni. For instance, the company hopes that the proximity of the new UAE acreage to its development and production assets may support rapid development of any discoveries, emulating the successes that it has had with this approach elsewhere."

MARSOL

INTERNATIONAL LIMITED

MAXIMISE OPERATIONAL LIFE FOR OIL AND GAS MARINE HOSES

Marsol International provides a comprehensive hose management service that ensures a safe, reliable and fit-for-purpose operation of marine hoses.

Our Hose Management Service is designed with the "asset's integrity" in mind. It is aimed at knowing the condition of the hoses and its environment to realise the optimum life expectancy at a particular location. Maximising operational life and minimising operational costs and risk is the goal.

Our innovative solution includes a more effective and efficient hose assembly system designed to reduce risk and degradation of the hoses as well as achieve considerable savings on changeout time and cost. We aim to minimise downtime or rework during a changeout and avoid unnecessary stress on the asset in the process. The overall result is the achievement of long-term, cost-effective functionality of the terminal facility and assets.

Our services include: Hose Inventory Management • Hose Integrity & Life Extension • Hose Testing • Hose Dynamic Analysis • Hose Repair • Hose Change Out

Tel: +971 4 886 2822
Email: sales@marsol.biz
Web: www.marsol-international.com

Petrofac launches graduate programme

PETROFAC HAS LAUNCHED its 2019 global graduate programme as part of its commitment to supporting and developing young talent. Since launching its graduate programme in 2004, Petrofac has employed 1,500 graduates. The company also aims to enhance its already diverse workforce by encouraging graduates from across the world to apply for this year's programme.

Through the Petrofac Academy – the company's in-house Centre of Excellence for employee and career development – successful candidates will undergo a four-year structured programme whilst working in the business. Alongside technical training in their chosen discipline, graduates will have the opportunity to develop their skills through on-the-job learning, often on live projects. Additionally, they will have access to support to create tailored development plans.

Ayman Asfari, group chief executive, said, "Our global workforce comprises more than 80 nationalities across 30 countries. We are a people business, so our talent makes us who we are and sets us apart from our competition.

"The entire oil and gas industry is working hard to reverse a historical gender imbalance and skills gap. At Petrofac we are committed to playing our part by ensuring our graduate programme embraces diversity of ethnicity, nationality and gender," Asfari added.

Dentons advises OOCEP on sale of Khazzan stake to Petronas

DENTONS HAS ADVISED Oman Oil Company Exploration & Production LLC (OOCEP), the exploration arm of the state-owned Oman Oil Company SAOC, on the sale of a 10 per cent stake in the giant Khazzan gas onshore field and project in Oman to Malaysia's Petronas.

The Petronas unit, PC Oman Ventures Ltd, has acquired the stake in the Block 61 Contract Area, which is expected to produce around 1.5 bcf of natural gas per day by 2020.

Makarim Gas Development LLC, OOCEP's subsidiary in the EPSA, continues to hold a 30 per cent stake in the project while UK-headquartered BP holds the remaining 60 per cent.

In support of OOCEP's general counsel, Richard McLaughlin, Dentons advised on the regulatory and contractual structure of the deal, drafted the sale and purchase agreement and assisted with all the consents, pre-emption requirements and other conditions precedent leading up to the closing at the end of December 2018.

TechnipFMC signs offshore agreement with Saudi Aramco

TECHNIPFMC, IN CONSORTIUM with Malaysia Marine and Heavy Engineering Sdn Bhd (MMHE), has signed a long-term offshore agreement with Saudi Aramco.

This agreement, valid for six years, covers engineering, procurement, fabrication, transportation and installation of offshore facilities for the development of Saudi Aramco's offshore projects.

This agreement builds on the long-term relationship between TechnipFMC and Saudi Aramco, as well as the strong partnership between TechnipFMC and MMHE which has a proven track record of successful project execution and delivery. In support of this project, TechnipFMC will continue hiring and training Saudi engineers, supporting the on-going Saudisation initiative.

Nello Uccelletti, president of TechnipFMC's onshore and offshore business, said that the agreement willl leverage the know-how and expertise of all parties, eventually benefitting the Saudi industry.

ADNOC among five lowest GHG emitters

AS GLOBAL OIL consumption crosses the 100 mmbbl per day mark, the Abu Dhabi National Oil Company (ADNOC) is reinforcing its commitment to environmental stewardship, as it strengthens its position as one of the oil and gas industry's lowest emitters of greenhouse gases (GHG).

While addressing rising global energy demand, ADNOC is investing in new measures to reduce its environmental footprint. It plans to further reduce GHG emissions by up to 10 per cent by 2023, substantially increase its use of Carbon Capture, Utilisation and Storage (CCUS) technology, reduce its use of potable water and cut the volume of waste sent to landfill sites.

According to the International Association of Oil & Gas Producers (IOGP) Environmental Performance Report for 2017, ADNOC ranked in the top five lowest GHG emitters, with less than half the industry average, at 39.68mn tonne CO_2e, and has one of the lowest methane intensities of 0.01 per cent. At the same time, ADNOC has reduced the volume of natural gas flared by more than 72 per cent since 1995.

Dr Sultan Ahmed Al Jaber, UAE Minister of State and ADNOC Group CEO, said, "ADNOC's commitment to environmental stewardship has been a cornerstone of our operations since the company was founded in 1971. It reflects the foresight and vision of the Founding Father of the United Arab Emirates, HiH Sheikh Zayed bin Sultan Al Nahyan, who understood the importance of sustainability and protecting the country's natural ecosystems. The principles behind Sheikh Zayed's environmental legacy guide us today and will continue to do so in the future."

Golden age beckons for Egypt's gas industry

Egypt is at the centre of an emerging eastern Mediterranean gas energy hub, right on the doorstep of Europe, says Martin Clark.

Image Credit : Carabay/Adobe Stock

Egypt is now exporting 520mn cubic feet a day from its Idku plant.

THE OIL AND gas sector has played a key role in Egypt's economic revival of late, as it regains lost ground after the tumult of 2011. Massive investment in the nation's energy industry post-independence has fuelled a raft of discoveries offshore in the prolific Nile Delta area, driving up oil and gas production and opening up new export opportunities. The activities of big investors such as Eni and BP, among other industry majors, have all helped to position the eastern Mediterranean as one of the world's current exploration hotspots.

That looks set to continue, restoring Egypt to a 'new normal' after the so-called Arab Spring derailed growth and undermined investor sentiment some years ago.

This revival was, in large part, triggered by the discovery of the mighty Zohr field in 2015, the largest gas field in the Mediterranean with around 30 trillion cubic feet (tcf) of reserves. The field was brought on stream just two years later by Eni and is now producing some two billion cubic feet of natural gas per day (bcfd), or around 365,000 barrels of oil equivalent per day (boed). Eni hopes to raise this to a plateau production of 2.7 bcfd during 2019, in collaboration with state-owned Egyptian Natural Gas Holding Company (EGAS).

It has had an uplifting effect not only on production numbers and the economy in general, but also on the rest of the oil and gas sector. Multiple discoveries followed, bringing with it further investment in its trail.

BP – a partner in the Shorouk concession which contains the Zohr field – is working towards first gas in its Harmattan and Qattameya shallow projects by 2020. At the end of 2018, BP also announced plans to invest in the Nour deepwater gas concession off the northern coast of Sinai – near the Zohr field – in partnership with the UAE's Mubadala Investment Co.

Egypt also signed US$1 billion worth of deepwater exploration deals with Shell and Malaysia's Petronas for the drilling of eight more wells in the West Nile Delta area.

With more deals and drilling set to follow, Petroleum Minister Tarek El Molla has said he believes the sector will generate US$10bn worth of foreign investment in the coming year or so.

> "Cairo hopes to position Egypt once again as a regional hub for LNG trading"

Significantly, this upswell in gas output could spell a resumption of Egypt's export hopes. Once a big gas exporter, the country has only recently been able to halt costly imports, saving US$250mn a month by no longer buying in liquefied natural gas (LNG) from abroad, according to El Molla. Egypt started importing LNG back in 2015 as diminishing gas output failed to meet soaring domestic demand.

It could equate to a new lease of life for the country's LNG exports out of the Idku and Damietta plants on the Mediterranean coast. Egypt is now exporting 520mn cubic feet of LNG per day from its Idku plant, a petroleum ministry official disclosed in early January. The Idku facility is part-owned by Shell.

Going forward, Cairo hopes to position Egypt once again as a regional hub for LNG trading. That means building ties with neighbouring states as well as securing markets further afield. It has already signed a deal with Cyprus for the construction of a pipeline that will channel gas from the island's Aphrodite field to facilities in Egypt.

Links with Israel have also been resurrected after the suspension of Egyptian pipeline gas exports several years ago. An existing pipeline runs from El Arish in northern Sinai in Egypt to Ashkelon in Israel but was frozen in 2012 following repeated terrorist attacks. But a year ago, an Egyptian company signed a new deal worth around US$15 bn to import gas from Israel for processing in Egypt – this time moving the gas in the other direction – further enhancing the nation's reputation as a trading hub.

It's still early days, but there are plans to build a new underwater pipeline between the two countries to carry gas from Israel's offshore Leviathan and Tamar fields to Egypt's existing LNG plants for processing and re-export.

Things rarely go smoothly in this corner of the world, but with investors warming to Egypt and its growing gas reserves, the potential is huge. ■

The outlook for the oil market in 2019

Economist Moin Siddiqi looks at factors shaping the oil market and prices in 2019.

CRUDE OIL PRICES were volatile during H2 2018, spiking to four-year highs in early October of US$86.74/barrel, as US sanctions on Iran went into force. However, that rally unwound spectacularly, as spot Brent plunged to the mid-US$50s by year-end (a 15-month low). There are plenty of variables that could yet fuel more unwelcome oil market volatility as we head into 2019.

Key questions over the coming months are:
Is fuel demand slowing due to a subdued global economy with heightened risks to trade and investment, particularly in China and India where two-thirds of the growth in demand is projected to come from?
Will US shale production maintain its incredible pace?
Will chronic decline in Venezuelan output continue?
What will 'full-blown' US sanctions do to Iranian exports?
Will OPEC+ partners (chiefly Russia) enforce output discipline?

BMI Research (Fitch Group co.) wrote, "Global GDP growth has desynchronised, with the Eurozone and Japan disappointing expectations and a number of emerging markets showing signs of strain. Several factors signal a more challenging backdrop is forming, including slowing credit growth, a rising dollar and tightening monetary conditions."

Global oil demand and supply balance (mn bpd)

	2016 *	2017 *	2018 /	2019 /
Total petroleum consumption	95.61	97.29	100.00	101.54
of which: OECD 35 countries [1]	46.97	47.42	47.63	48.05
Emerging & developing economies	48.64	49.87	52.38	53.49
Total production [2]	95.65	96.39	100.41	101.79~
of which: Non-OPEC supply	56.65	57.53	63.17	65.54\
Global balance (closing year-end)	0.04	-0.9	0.41	0.25
OECD commercial inventories	3,002	2,853	2,883	2,951>

1.Organisation for Economic Cooperation & Development, representing industrial nations. 2.Crude oil, shale oil, oil sands, & natural gas liquids. *OPEC est; /EIA est; ~ Assuming OPEC output averages 30.88mn bpd; >EIA latest projection.
World oil consumption rose by an average of 1.7mn bpd in 2015-17, up from 1.1mn bpd over 2012-14 (BP data).

Sources: OPEC Secretariat & EIA Short-term Energy Outlook, January 2019.

Big Five oil producers, by production, 2018 (mn bpd)

	2016	2018	% chg 2018-16	Proved 2017 reserves (bn barrels)	R/P 2017 ratio * (years)
Russia (incl. NGLs)	11.10	11.39	2.6	106.2	25.8
USA (excl. liquids)	8.86	10.90	23.0	50.0	10.5
Saudi Arabia (excl. NGLs)	10.40	10.30	-0.9	266.2	61.0
Canada (incl. oil sands)	4.52	5.21	15.2	168.9	95.8
Iraq (excl. NGLs)	4.39	4.55	3.6	148.8	90.2
Total	39.27	42.35	7.8	740.1	
% of World Total	41.00	42.10		43.6	50.2//

***Reserves-to-production ratio - if existing reserves at the end of any year are divided by output in that year, the result is the length of time that those reserves would last if output were sustained at that rate; //global average.**
US and Canada reserves comprise shale oil and oil sands (synthetic crude).

Sources: OPEC, EIA, & BP Statistical Review of World Energy June 2018.

The threat of a protracted US-China trade war could exacerbate economic slowdown and depress fuel demand even further, also hitting other asset classes, mostly equities. "Trade tensions might escalate and lead to slower economic growth, and in turn lower oil demand," warned the International Energy Agency (IEA). Higher US interest rates (relative to other prime economies) and currency crises in emerging economies amid a stronger US dollar hiking the costs of oil imports could impact the market. Sweeping energy subsidy reforms across emerging markets may also weigh on fuel consumption.

Pricing scenarios

The oil price is dictated by three variables – supply, demand and market speculation. Short-term, supply is not very elastic, neither is demand, but 'daily' actions of hedge funds and money managers on futures/options markets are unpredictable. A one-third cut in combined net long positions of the latter group was reported last December, according to the Commodity Futures Trading Commission.

> "Is fuel demand slowing due to a subdued global economy?"

The latest OPEC+ deal to slash output by 1.2mn bpd in HI 2019 (Iran, Libya and Venezuela exempted) should at least put a 'floor' under prices, whilst resulting in a 'balanced' rather than 'tight' market. Although cuts might prevent inventory build-up, this will perhaps not be visible until mid-year, which could force extending cuts until end-2019. "The global supply surplus is not resolved, and would likely re-emerge if OPEC+ let up on its production cuts," said the IEA.

Global inventories have normalised, albeit with monthly deviation, thus broadly price supportive. "The oil market is a lot cleaner now from a positioning standpoint. Given that inventories are still not too high, we believe oil prices should find some support from a fundamental perspective," said Bank of

America Merrill Lynch. Barclays Bank also pointed to fundamentals indicating, “Things aren’t as bad as they seem.” For instance, OECD stocks (crude and products) in terms of “days of demand cover,” remain below the five-year average.

Geopolitical strains and risk of severe disruptions from Iran, Venezuela and Libya cast a shadow not only on the supply-side but also the future path of oil prices. The CEO of Total, Patrick Pouyanné, noted that the world has entered "a new world… where geopolitics are dominating the market again." Iranian exports will plunge as the Trump administration is unlikely to extend the granted exemptions to importers (including China, South Korea and India) in early May, which combined with shrunken global spare capacity (well below 2mn bpd) will expose prices to supply shocks and may tilt the market into deficit from H2 2019.

Furthermore, global financial uncertainty strengthens the US dollar in which oil transactions are denominated. Continued depreciation in emerging countries’ currencies versus the greenback makes crude imports more expensive, thus hitting both fuel demand and prices. Most oil exporters (including in Middle East) peg their currencies to the dollar, which offsets oil price weaknesses.

However, much depends on relentless growth in non-OPEC supply (notably US). The Energy Information Administration (EIA) expects US output to surge by one-tenth to 12.1mn bpd in 2019. But can the shale boom continue in a bear market? Shale producers need US$40-$50/barrel to pay the high-yield bonds used for financing. “If WTI crude remains around current levels (US$50/bbl), US growth should start to slow,” noted Morgan Stanley.

Oil futures in Q4/2018 moved into ‘contango’ (i.e. near-term prices dipped below long-dated ones), reflecting concerns over a supply glut. For spot prices to rise, the futures curve needs to shift back into a stronger ‘backwardation’ (i.e. where near-term prices trade at a premium to longer-dated futures). “The good news for oil prices is that the current data does not justify the recent and sudden flattening of the curve. That is because inventories are not elevated, demand growth is likely to beat low expectations, Iran exports will decline further and ultimately core OPEC will reduce output in our view,” noted Goldman Sachs.

In essence, oil prices are subject to periodic changes in supply side, inventories, dollar value, OPEC’s actions, and global demand, which underpin market volatility. On supply/demand dynamics, a fairer price is probably closer to US$60-65/bbl rather than in the US$70-80 range during 2019. Shale is a technological revolution that will cap oil relatively cheap over the medium-term.

Market fundamentals

Supply and demand is approaching the historical 100mn bpd threshold on an annual basis. The EIA expects 2019 non-OPEC output to increase +2.37mn bpd to 65.54mn bpd – above OPEC’s estimate (64.19mn bpd). This reflects a continuous surge in North America and new offshore projects online in Brazil, but Mexico, Norway and China are expected to see hefty declines in mature fields in the absence of new projects.

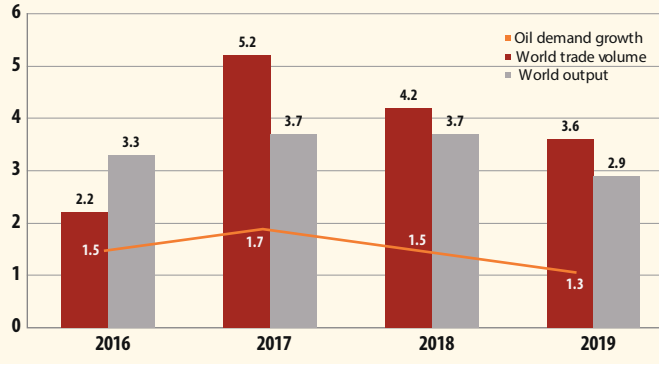
The IEA foresees supply continuing to outpace demand throughout 2019, as a "relentless" rise in output offsets consumption growth that is at risk from a slowing economy. That, in turn, poses a dilemma for

Oil price projections, 2019*

	US$/bbl
Bank of America Merrill Lynch	70.00
Barclays	72.00
Citi Research	60.00
Goldman Sachs	62.50
JP Morgan Chase	72.60
RBC Capital Markets	68.00
UBS	68.50
Energy Information Administration	60.52
Standard & Poor's	65.00
Morgan Stanley	61.00

Brent benchmark for global crude prices.

Correlation between global economic activity and oil demand growth, per cent (year on year)



The increase in world trade was instrumental in boosting global GDP growth to higher levels in 2017 and H1 2018. Should trade disputes rise further amid geopolitical tensions,it could impact business and consumer sentiment. This may then reduce investment, capital flows and consumer spending, with a subsequent negative effect on the oil market.

Sources: IMF, World Economic Outlook, October 2018, OPEC Oil Market Report, January 2019 and World Bank Global Economic Prospects, January 2019.

OPEC’s kingpin (Saudi Arabia) to sanction even deeper cuts to restore market balance. Concurrently, there could be less call on OPEC crude – projected at 30.8mn bpd in 2019 – down 0.9mn bpd on 2018 – based on OPEC data. Saudi oil minister Khalid al-Falih tried to reassure the market that we will not see a repeat of the 2014-16 meltdown. “We

remain focused on fundamentals, I can tell you we will achieve balance between supply and demand in 2019."

However, the oil industry has changed in recent years with the dominant 'Big Three' (Saudi Arabia, Russia and the USA) now comprising two-fifths of total liquids production. Global supplies grew rapidly in 2018 as record output from three big producers more than offset declines from Iran and Venezuela. OPEC cuts should allow for a rebuilding of spare capacity, reducing supply risks going forward.

Global oil demand – highly sensitive to expansion or contraction of industrial activities – could remain broadly 'healthy', with growth forecasts of 1.54mn (EIA); 1.30mn (IEA); and 1.29mn (OPEC), respectively, in 2019. These projections are subject to downward revisions if global GDP growth falters in 1Q or 2Q 2019. Goldman Sachs sees the potential for a sharp collapse in demand as a "low probability outcome" given the current economic momentum.

As for refined products (light and middle distillates), there are uncertainities to demand related to economic developments in major consuming markets; substitution with natural gas and renewable/alternative sources of energy; subsidy programmes and their removal strategies; commissioning, possible delays, or cancellation, of petrochemicals and refinery projects; technological improvements in transportation sector for fuel efficiencies; and slow/steady growth of hybrid and fully electric vehicles worldwide.

Long-term investment

The past year saw an uptick in capital expenditure (capex) by the oil and gas industry driven by price revival and lower development/project costs, which may continue into 2019. After collapsing between 2014-2016 by a hefty 40 per cent amid oil recession, global upstream investment rose five per cent last year, accounting for projects worth US$472bn, according to the IEA's *World Energy Investment 2018* Report. The US shale success story is fuelling much of the growth; exploration budgets of US producers reached US$132.5bn in 2018, up from US$88.2bn in 2016, reported Texas-based CWT Energy, Resources & Marine.

2018 stood as the best year for upstream investment since 2015, according to Rystad Energy. It reported: "Global exploration activity and discoveries have halted their year-after-year decline and look set to rise in 2019. This is an exciting recovery which runs contrary to a decline in global exploration spending from 2014 to 2017." Last year, monthly discoveries of conventional oil and natural gas were estimated at 826mn barrels of oil equivalent (boe), up one-third on 625mn boe in 2017; offshore finds represented four-fifths of total volumes.

"Four years of deep capital rationing have had a severe impact on resource renewal, especially in the conventional sector," said Wood Mackenzie. Although upstream capex is rebounding post downturn, sustainability is an issue. It expects energy groups to spend a total of US$425bn, up from US$400bn during 2016-17, but significantly below 2014 capex (US$770bn) before prices crashed. Annual capital budgets of upstream players need to rise by one-fifth or US$600bn to cope with the future demand surge in the next decade.

However, WoodMac doesn't expect E&P firms to significantly raise investments amid uncertainties over oil prices and the pace of energy transition. Oxford Institute of Energy Studies (OIES) thinks the majors' exposure to long-term risks remains a big concern. "We do see upstream investments persisting into short-run cycle projects, as well as greenfield projects continuing to be delayed or cancelled. What this shows is that there's still not a lot of confidence around, despite the price recovery." While brownfield boosts near-term output, greenfield projects help expand future capacities. The IEA estimated greenfield investment comprised just one-third of total oil and gas investment in 2018, as the industry sought to limit upfront costs and in some cases rewarded shareholders with higher dividends, rather than implementing ambitious expansion projects.

> "Energy companies are budgeting on a lower-for-longer basis"

Preliminary analysis on global 2018 E&P investments based on the supply segment group shows that investment in shale was the highest, with a projected growth of 18 per cent compared to five per cent for conventional onshore investments. In contrast, combined offshore (shelf, mid-water and deep-water) investments fell by nine per cent last year – reflecting higher risks and costs.

Anticipated supply crunch

Although data suggests possible oil prices of US$60-70, fundamental market changes make a return to 'triple-digit' territory unlikely, thanks to booming shale output which turned scarcity into a glut, while offsetting a decline in new conventional projects. Energy companies are budgeting on a lower-for-longer basis. Oil majors' cost-cutting efforts have positioned them to make profits and generate cash at conservative US$50-60 or US$55-65/bbl price assumptions. According to JP Morgan estimates, the break-even oil price for BP is US$46; Total (US$55); Shell (US$58); Equinor (US$48); and ENI (US$59). BP sees a range of between U$50-70 as "sensible" and plans on that range.

Exploration austerity, fewer new project starts-ups and depleting global spare capacity could lead to market tightness from 2020 onwards. Goldman Sachs said there was currently enough oil to meet demand, but warned that "global spare capacity is dwindling to the lowest level that we can document ... meaning any further supply disruptions would be difficult for the market to manage – and could lead to spiking crude oil prices."

If 'conventional' E&P capex doesn't increase substantially from today's modest levels and US shale peaks, future supply security will be at greater risk, thus posing a threat to the global economy. ■

OPEC surplus production capacity (mn bpd)

				Projections	
2015	2016	2017	2018	2019	2020
1.5	1.3	2.0	1.54	1.9	2.3

Source: EIA Short-term Energy Outlook, January 2019.

Saudi Arabia accounts for more than a third of OPEC´s total production and over half of the group´s spare capacity. The UAE and Kuwait also hold some excess supply capacity.
In the medium-term, around 160 projects with an estimated cost of some US$156bn, are being undertaken by core OPEC countries to boost their production capacities.

Global upstream development capex* (US$bn)

	2014	2015	2016	2017	2018	2019
Total investment by non-OPEC	760	585	434	450	460	490
OPEC upstream investment	120	39	38	40	36	30
Oil price (Brent) yr-avg. US$/bbl	98.95	52.39	43.73	54.17	71.22	60.52/

****Also known as exploration and production (E&P) spending; / EIA proj.***

Sources: Rystad Energy and OPEC Secretariat.

There is a strong correlation between spending and discovering productive oil resources. In the early 2000s, exploration found eight billion barrels of oil annually. That figure has plunged by three-quarters since 2014, according to Wood Mackenzie. Global upstream exploration spending plunged from US$60bn in 2014 to US$25bn in 2018, leading to a steep fall in new finds.
Reserve replacement ratio (RRR) in 2017 reached only 11 per cent for oil-gas combined, compared to 50 per cent in 2012. 2018 saw an uptick in RRR to about 15 per cent (Rystad Energy).

Inspired by the past. Leading into the future.

INNOVATION. COLLABORATION. EXECUTION.

We've come a long way since 1919. What started with a single product in a small town is now a global organization with more than 60,000 employees around the world. For 100 years, we have earned our reputation as "the execution company," delivering unparalleled customer service and innovative solutions to the oil and gas industry. Our inspiration comes from our people—past and present—and the values we stand for: integrity, safety, collaboration, competitiveness, creativity, reliability, and respect. Together, we are committed to continuing our legacy as one of the most well-respected energy services companies in the world as we prepare to lead into the future.

HALLIBURTON

100 YEARS

hal100.com

What does 2019 hold for the MENA region?

Wood Mackenzie's upstream MENA team identifies the themes that will define the region's oil and gas development over the next 12 months.

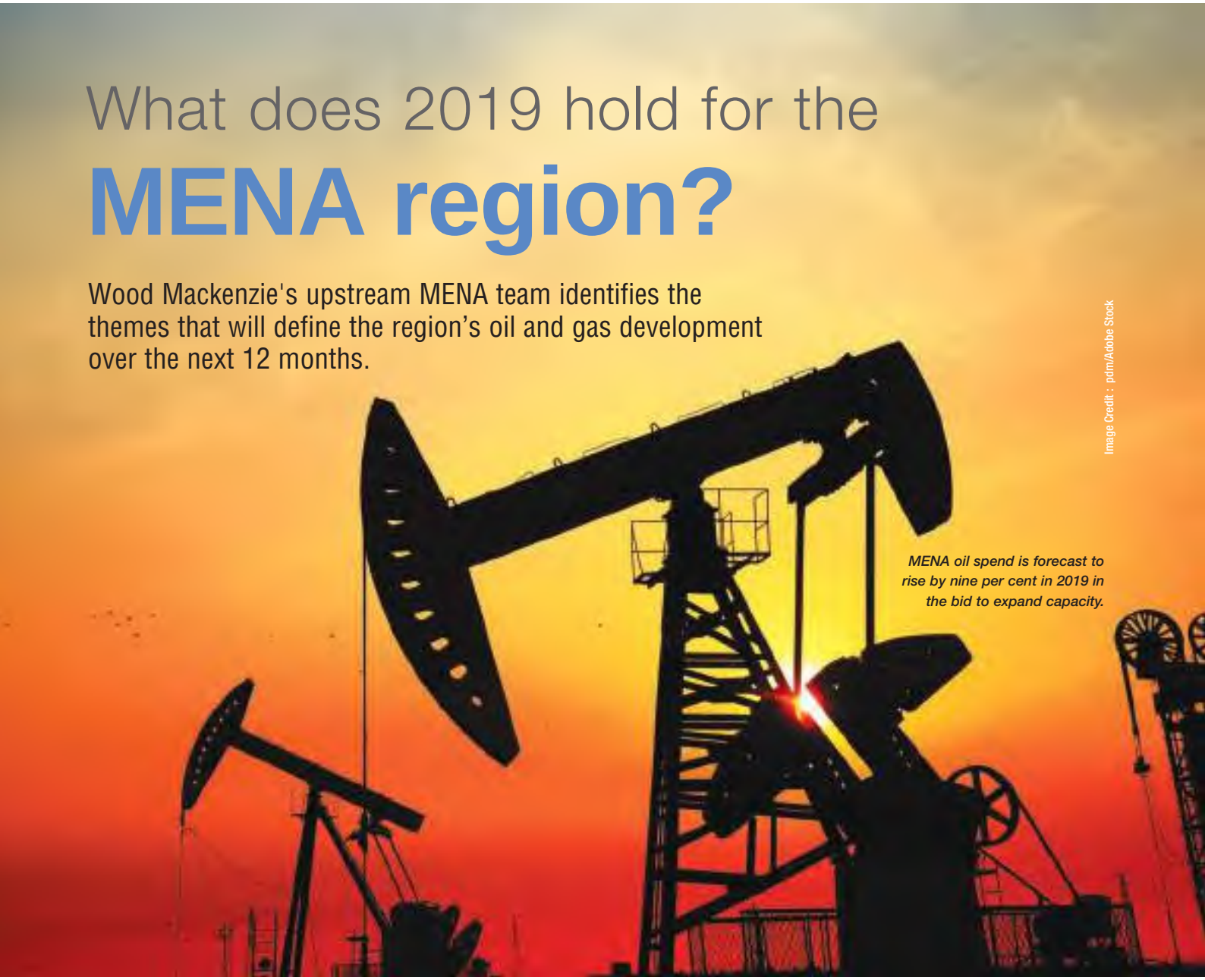


Image Credit : pdm/Adobe Stock

MENA oil spend is forecast to rise by nine per cent in 2019 in the bid to expand capacity.

Middle East investment offsets North Africa declines

Upstream capital investment will remain relatively flat in 2019 at US$85bn – but this isn't the whole story, as North Africa declines will be offset by Middle East gains. Oil spend dominates the Middle East, up nine per cent year-on-year at US$56bn, as the OPEC nations expand or, in the case of Saudi Arabia, maintain capacity. Brownfield expansions in shallow water drive the increase at Safinayah, Marjan and Zuluf in Saudi Arabia, and Bul Hanine in Qatar. With numerous projects to chase, the service sector is in for a bumper year. The mood is buoyant and confidence is on the rise. But with 12bn barrels of oil equivalent (boe) in the region sanctioned in 2018, and the potential for more than five billion boe in 2019, there are questions about the supply chain's capacity to take on all the extra work.

In contrast, North Africa spend will fall 25 per cent year-on-year to US$12bn, due mainly to the winding down of investment at Egypt's deepwater Zohr and West Nile Delta fields. Oil investment will be down 10 per cent year-on-year, but should recover in 2020 to around US$4.5bn, similar to 2017's spend. This year, however, Algeria may offer some relief. Following on from two FIDs in 2018, three more gas projects could be sanctioned in 2019 – the Hassi Mouina fields, Hassi Ba Hamou Area and Bourarhet Nord – equating to more than 0.5 billion boe.

> "With numerous projects to chase, the service sector is in for a bumper year"

Five projects will drive gas production growth

- Zohr gas production is set to grow from two billion cubic feet per day (cfd) to three billion cfd in 2019 as the stage 2 wells and gas processing modules are commissioned.
- The BP-operated West Nile Delta will add around 400mn cfd as phase 2 (Giza and

OUT HERE, FAILURE ISN'T AN OPTION.

When purchasing a Sullivan-Palatek portable air compressor, you acquire a machine expertly engineered for superior performance and reliability. For the drilling industry, our 1300-1800 CFM units are the ideal partner for the job. With pressures up to 150 psi, these Tier 3 units are offered with either a Caterpillar or Cummins engine. Designed and built in the USA, there's nothing cookie cutter about them. Sullivan-Palatek equipment and service are dependable by design. For more information, contact our Regional Sales Director, Rajesh George, at *rgeorge@palatek.com*.

Sullivan Palatek

»LEARN MORE AT: www.Sullivan-Palatek.com / +97150 6269709

Dependable by design.™

Fayoum fields) ramps up and Raven starts production. Egypt's gas balance will move to surplus in 2019 with these supply increases. Domestic demand will absorb most new volumes, but excess gas will support increased exports out of Egypt LNG, and a restart of the mothballed Damietta plant.

- In Israel, Leviathan is scheduled for start-up in late 2019. It is a large fixed platform development with 1.2bn cfd capacity. At least 350 million cfd is contracted for delivery to Egypt.
- In Iraq's Kurdistan region, the Khor Mor gas project is targeting a 500mn cfd expansion. The project will deliver gas to the local market. More significantly, it will open up gas exports beyond 2019.
- In Iran, the super-giant South Pars gas field should add four billion cfd of production capacity as various platforms at phases 13 and 22-24 are commissioned. The associated condensate produced from this will create a headache for Iran, with US sanctions constraining exports.

Qatar's megatrains will attract interest

Partner selection for Qatar's planned LNG expansion is ongoing, and we expect awards to be made in advance of FID in 2020. Qatar Petroleum (QP) has bold ambitions to increase the country's LNG export capacity from 78mn to 110mn tonnes per annum (tpa) next decade. This will be achieved with four new liquefaction trains of eight million tpa each, supplied with four billion cfd of gas from a dedicated section of the North Field. We expect to see all the incumbents, primarily the majors, jostling for position.

> "Investments in gas developments are picking up significantly"

OPEC will continue its balancing act

December 2018's OPEC+ agreement combined with Iran's already reduced output means that the region's oil production will fall year-on-year. The benefits of near-term production restraint will help pay for longer-term capacity expansion. Saudi Arabia will lead the reductions, while the UAE and Kuwait will likely comply too. Libya is exempted, so could go produce more than the 1.3mn bpd it reached at the end of 2018. But sustaining that level will be tough – we expect Libya to average close to one million bpd in 2019. Iran's six-month sanction waivers mean that its production will stabilise around 2.9mn bpd, at least for the first half of 2019. We expect production to drop to around 2.7mn bpd for the rest of the year. The OPEC wildcard is Iraq. The country has been steadily building oil capacity and could go beyond five million bpd in 2019. Of the MENA OPEC members, Iraq has been the least compliant with output cuts. Even if it does continue to increase oil production, we still expect an overall year-on-year reduction in MENA output of around one million bpd, or four per cent.

Frontier exploration plays will pique IOC interest

Egyptian offshore gas remains a popular theme. There are high hopes for Eni's Nour-1 well, targeting a multi-trillion cubic feet carbonate prospect in the shallow waters of eastern Nile Delta. A similar play is targeted by Dana Gas on its North El Arish block. In 2018, BP teamed up with Eni in its Libyan exploration acreage. After four years under force majeure, drilling will resume in the second half of the year. Offshore exploration will step up. A Total-led consortium will spud Lebanon's first ever offshore exploration well. The wildcat, expected on block 4, could prove transformational for the country. Bahrain's offshore unconventional gas discovery, Khalij al Bahrain, will see at least one appraisal well. In Oman, Eni will survey its large Block 52. The UAE's three bid rounds – Abu Dhabi, Ras al Khaimah and Sharjah – are expected to be awarded early in the year. Sixteen blocks are on offer with interest expected from the Majors through to smaller independents. Egypt is set to offer access to two frontier plays – the Red Sea in Q1 and the west Mediterranean in Q2. Fresh bid rounds are also planned for Israel and Oman. ■

Middle East investment surge forecast in 2019 to meet gas demand

THE GLOBAL OIL and gas industry's investments in new projects are set to double in 2019, with Qatar, the UAE and Saudi Arabia fuelling growth.

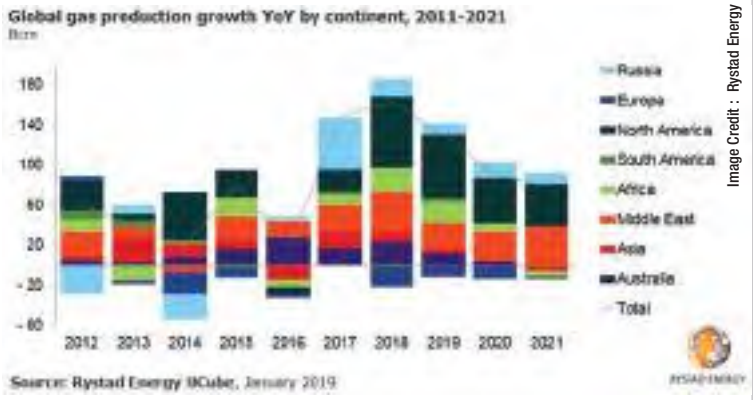
Rystad Energy forecasts that projects involving more than US$240 billion in greenfield investments will be sanctioned in 2019, with almost 25 per cent expected to come from the Middle East region.

"The industry in the Middle East is aiming to ramp up gas production in order to meet rising regional demand, while also increasing oil output," Rystad Energy senior analyst Aditya Saraswat said.

Middle East greenfield investments are forecast at about US$56bn in 2019, more than six times the investments sanctioned in 2018. Investments in gas developments alone are expected to jump to US$30bn this year from around 1.7bn in 2018.

"The growth is primarily driven by offshore gas developments in Qatar and the UAE, as well as oil developments in Saudi Arabia," Saraswat added. "Notably, investments in gas developments are picking up significantly. Gas development projects in Qatar and the UAE account for almost a third of the resources expected to be sanctioned next year, while Saudi Arabia's oil expansion projects at Berri, Marian and Zuluf account for more than half."

Rystad Energy estimates that Qatar's plans to boost its LNG capacity to 100 million tpa will require more than US$35 billion in greenfield investments, making it one of the biggest projects to be approved in the region over the last decade.



The UAE is prioritising offshore gas projects to increase gas availability for domestic consumption and reduce its dependence on imported gas and LNG, looking to add 1.6bn boe of resources. Rystad Energy expects these plans will require around US$14.5bn in greenfield investments.

Saudi Arabia will develop around 9.8bn boe of additional resources by investing more than US$24.5bn in greenfield projects at the Marjan, Berri and Zuluf oilfields.

According to Rystad, the Middle East achieved the second largest increase in gas production globally in 2018 after the USA, with a net production increase of 39 bcm.

DNV GL survey finds increased confidence about MENA growth prospects

EIGHTY-THREE PER cent of senior oil and gas professionals in the Middle East and North Africa surveyed in new research are optimistic about the sector's growth in 2019, compared to 63 per cent last year and to 76 per cent globally now.

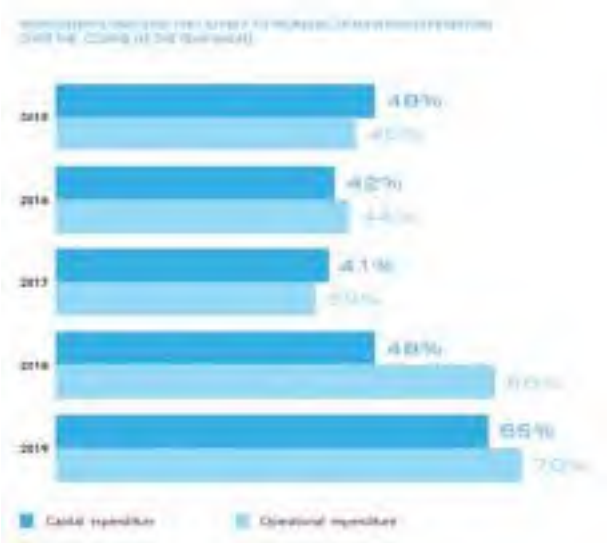


Image Credit : DNV GL

These findings appear in *A test of resilience*, the ninth annual benchmark study on the outlook for the oil and gas industry by DNV GL. The research is based on a global survey of nearly 800 senior and gas professionals, and in-depth interviews with industry leaders.

MENA respondents' optimism over overall prospects for their own organisations in 2019 has also risen over the past year, from 78 per cent to 85 per cent, and is second only to China (92 per cent). As confidence grows, 83 per cent in MENA predict their companies will increase or maintain capital expenditure in 2019, the highest such level of confidence among regions in DNV GL's analysis. Nearly two-thirds (62 per cent) in MENA believe their organisations will favour projects that are adaptable within shorter time-frames.

"This research shows the industry in the Middle East and North Africa gearing up to dominate global oil and gas production for decades to come. It aligns with DNV GL's September 2018 *Energy Transition Outlook* (ETO) forecasting that more than half of conventional onshore oil production and the majority of offshore oil production will come from here. The ETO model of world energy supply and demand also sees the region becoming the largest producer of on- and offshore gas by mid-century," said Ben Oudman, regional manager, Continental Europe, Middle East, East Africa and India, DNV GL – Oil & Gas.

DNV GL has previously suggested that greater supply of oil and gas from MENA in coming decades will be driven by large-scale, low-cost production with operators responding to growing relative abundance by asserting competitive advantage. The technical advisor argues that realising this huge opportunity will involve companies maintaining focus on costs while making the massive investments required to meet anticipated demand.

DNV GL's new research underlines undoubted challenges to achieving this as the upswing continues and the easiest cost efficiencies have already been made and embedded. More than half (53 per cent) of MENA respondents saw price inflation from suppliers in 2018. Only around 15 per cent say their organisations were highly successful in achieving cost-efficiency targets, compared to 22 per cent in 2017, while 47 per cent expect higher supply chain costs in 2019. The same proportion say their organisations' contracts are exposed to cost inflation because of the recovery in oil prices in 2018.

Image Credit : DNV GL

While the percentage anticipating that cost control will be a top priority in the year ahead has fallen from 41 per cent to 26 per centin a year in MENA, *A test of resilience* is encouraging on long-term prospects for achieving sustainable margins. More than half (53 per cent) of the region's senior oil and gas professionals now agree that companies will be able to achieve high profitability in the next decade, well up on the 39 per centwho thought so in 2018. In addition, cost controls remain firmly in place: 89 per cent expect them to increase or stay the same this year, compared to 82 per cent last year.

Resilience through talent and technology transformation

The 21st edition of the Society of Petroleum Engineers (SPE) Middle East Oil & Gas Show and Conference (MEOS) takes place from 18-21 March 2019 at the Bahrain International Exhibition and Convention Centre.

MORE THAN 8,500 oil and gas professionals will convene to hear from more than 400 expert speakers and meet with more than 200 exhibitors at the event, held under the patronage of HRH the Prime Minister of Bahrain Prince Khalifa bin Salman Al Khalifa.

This year's conference theme 'Resilience through Talent and Technology Transformation' reflects on how the industry can stay the course as it stands on the brink of a technological revolution while dealing with the implications of a long-lasting low oil price environment, via a series of high level panels, open discussions and workshops.

Technical presentations and poster presentations will cover real life case studies, best practices and the use of emerging technologies across 12 key topics: the 4th industrial revolution, drilling and completions, EOR, exploration geology and geophysics, HSSE, human resources and diversity, production and facilities, reservoir characterisation, unconventionals, reservoir engineering, project management and energy efficiency and innovation.

A three-day exhibition runs parallel to the conference from 19-21 March. More than 200 exhibitors from 25 countries will showcase the latest innovations, products and services in all areas of the upstream sector. GCC national oil and gas companies will be exhibiting alongside international supermajors, service industry giants and independent specialist suppliers and distributors from across the globe.

Image Credit : UBM AEM

The busy exhibition floor at MEOS 2017.

New features

The packed agenda at MEOS 2019 opens with two brand new features – the MEOS 2019 Energy Awards and the SPE Middle East Energy Summit.

The inaugural MEOS Energy Awards recognise the outstanding efforts of individuals in the upstream oil and gas industry across five categories: technology and innovation, transformation and industrial development, performance and project delivery, HSE and social responsibility, and talent and capability development.

The new one-day Energy Summit takes place under the theme 'Towards Resilient and Sustainable Energy Strategies'. Ministers and energy kingpins will discuss the need for countries reliant on non-renewable natural energy sources to generate secure, sustainable and practical energy strategies to guarantee future economic prosperity.

Conference highlights

High level discussion continues at the conference opening and ministerial panel session, where speakers will address the role of the oil and gas industry in the evolving global energy mix as forecasts indicate new sources of energy are to become large contributors to the global economy, and the role of government in addressing this new balance of global energy supplies.

Presidents and CEOs from Saudi Aramco, Schlumberger and Baker Hughes, a GE Company will reflect on resilience in the future, at the subsequent executive plenary session.

Other conference highlights include an industry keynote session exploring how the oil and gas sector is adapting to demands for cleaner technologies and energy sources; a workshop sharing best practices to support cultural transformation and build a truly diverse workplace; and six panel sessions featuring CEOs, presidents and managers. ■

For further information contact Joanne Blundell, UBM AEM, email: joanne.blundell@ubm.com, www.meos19.com.

NCS MULTISTAGE

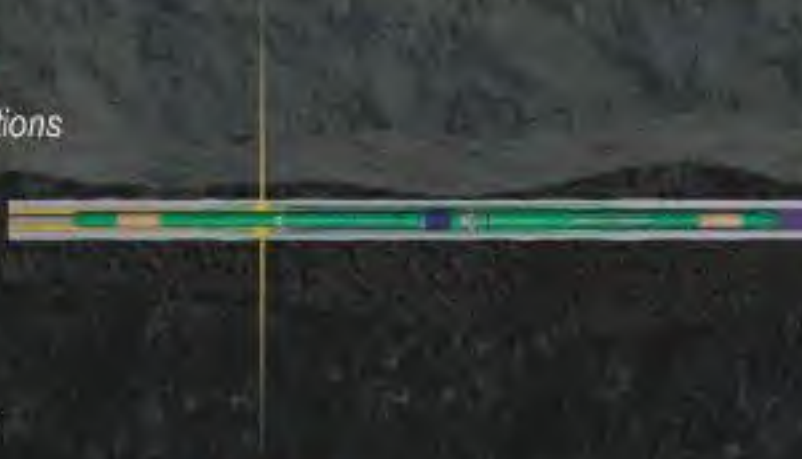
Visit NCS Multistage in Sanabis!

At the SPE Middle East Oil and Gas Show and Conference
March 19-21, 2019
Bahrain International Exhibition and Conference Centre

WORLD'S LEADING PINPOINT HYDRAULIC FRACTURING TECHNOLOGY

Predictable, verifiable, and repeatable stimulations

- Enables controlled optimization for completions and reservoir development
- Sand control options
- Minimize post-completion well cleanouts
- More than 10,000 wells completed
- More than 170,000 sleeves installed
- North America, North Sea, Argentina, China, Russia



THE UNIQUE AIRLOCK® CASING BUOYANCY SYSTEM

Land long casing strings on 99+% of first attempts

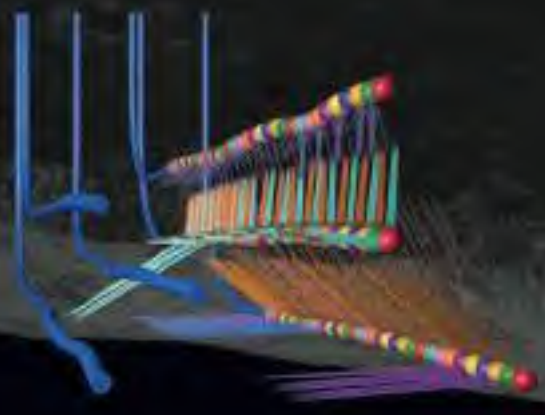
- More than 4,500 installed
- Interventionless
- Leaves full-ID wellbore for cementing, production, and remediation

After casing lands, pressure shears dome free to crush itself

TRACER DIAGNOSTICS

Chemical and radioisotope tracers map reservoir connectivity and reservoir fluid movement

- Extended-life oil tracers
- Extended-life formation-water tracers
- Natural gas tracers
- Fracture-fluid identifiers
- Radioisotope tracers plus logging services



Tracer Applications

- Detect and diagnose frac hits and interwell connectivity
- Verify stage contributions
- Calculate cluster efficiency
- Locate wellbore obstructions
- Monitor waterflood efficiency

ncsmultistage.com

Delivering the energy needs of tomorrow

The Egypt Petroleum Show (EGYPS), North Africa and the Mediterranean's largest oil and gas exhibition and conference, will be held at the Egypt International Exhibition and Conference Center (EIEC) from 11-13 February.

HELD UNDER THE patronage of the Egyptian President Abdel Fattah El Sisi and with the support of the Ministry of Petroleum and Mineral Resources, EGYPS 2019 is expecting more than 20,000 attendees from more than 40 countries to convene for three days to engage in dialogue, build partnerships and do business with local and international participants.

The Mediterranean and North African region offers an array of opportunities for today's oil and gas industry. Fast becoming the new regional energy hotspot, EGYPS 2019 brings together the global industry to discuss collaborative approaches within the upstream, midstream and downstream industries, reflecting growing global interest in the oil and gas industry's prospects across the region.

Under the theme "Delivering the Energy Needs of Tomorrow", the third edition of EGYPS will see industry leaders discussing developments and trends that will influence the strategies of companies investing in and operating in the region, and will showcase oil and gas innovations and technologies that will change the way these companies operate their assets.

This year, the exhibition will span 28,000 sq m of floor space with more than 400 exhibitors, including 22 National and International Oil Companies, featuring 13 official international country pavilions from Bahrain, Canada, China, France, Italy, Norway, Russia, Scotland, United Arab Emirates, the UK and USA, plus for the first time, pavilions from Germany and Cyprus. Additionally, the exhibition will also feature a new Digitalisation in Energy zone, providing a much needed focus on companies enabling the future advancement of the industry. This theme will also run through the high level conference panels, where discussions to support and enable companies to embark on the transformation journey will take place.

Returning in 2019 are the Women in Energy Awards, a platform created to celebrate the achievements of exceptional women in Egypt, North Africa and the Mediterranean oil and gas sector. New for 2019 is the introduction of the HSE Excellence in Energy Award, recognising outstanding projects, case studies and strategies in health, safety and environmental protection across the oil and gas value chain.

Image Credit : Adobe Stock

EGYPS 2019 takes place in Cairo.

> "New for 2019 is the introduction of the HSE Excellence in Energy Award"

EGYPS 2019 has two new features, a Global Meetings Programme, a high level service for facilitating face-to-face meetings, and a Youth Engagement Programme, an "edutainment" module created to inspire and encourage students to pursue a career in the oil and gas sector.

The EGYPS 2019 Conferences include a Strategic Programme, Technical Programme, Finance & Investment Briefings, Women In Energy Conference and new for 2019, a HSE In Energy Conference and Security In Energy Conference. Confirmed speakers include His Excellency Tarek El Molla, Minister of Petroleum and Mineral Resources, Arab Republic of Egypt; His Excellency Azhari A. Abdalla, Minister of Petroleum & Minerals, Republic of Sudan; Patrick Pouyanné, Chairman and CEO, Total, Bob Dudley, CEO, BP and Marco Alverà, CEO, Snam.

EGYPS 2019 offers a platform for leaders of today to discuss subjects ranging from new discoveries, investments, downstream diversification and integration, data-driven operations and digital innovations through to human capital and talent management.

Participants will hear directly from the Egyptian Ministry of Petroleum and Mineral Resources about the next wave of projects, reforms and policies, learn from global industry leaders on the latest market trends and project advances, and receive exclusive insights directly from government representatives and industry-leading financiers about Egypt's IPOs and economic developments. ■

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

HEAVYWEIGHT LIFTING WITH EASE

Check out our industry renowned Dozers & Pipelayers

8 models of dozers from 78 to 536 hp

3 models of side-boom pipelayers from 33 to 100 tons lifting capacity

Service & Parts support from a network of World-class dealers across Middle East

▸▸▸ More on www.dressta.com | ✉ info@dressta.com

DRESSTA
ENGINEERED FOR YOUR BUSINESS

Marsol International has developed engineering solutions for the fabrication, commissioning and operation of offshore terminals and infrastructures.

Image Credit: Marsol International

Complete lifetime efficiency for **offshore terminals**

Mike Young, director of Marsol International, argues for a full lifecycle approach involving all stakeholders to optimise costs and efficiency.

WHEN IT COMES to designing and constructing offshore terminals, investors and owners have traditionally appointed EPC contractors. The natural assumption was that this would be the optimal cost management incentive for construction contractors. However, those responsible for constructing the terminal will not be the ultimate operators, so it is fair to ask:

- Have the interests of all stakeholders been considered?
- Does it not stand to reason that those who will use and regulate the facility are involved in the process to ensure capital costs and operating expenses are optimised, while the ongoing integrity of the system is maintained?

It became obvious through the years, and the development process, that there were inconsistent contractual priorities when converting the FEED concepts into reality.

We have to keep in mind that the owners, or financiers, will not be the operators of the terminal. "This means that by the time these facilities are completed, the contracting structure, from FEED through to project champion will consist of investors' consultants, the EPC contractor, contractors' consultants, subcontractors and vendors. The 'Missing Man' here is the future operator, who will, inevitably take full care and custody of the facility under the O&M contract," says Young. He continues, "The needs and vulnerabilities of the other stakeholders will not have been considered by any of the preceding contractors, as it's not the scope of any individual participator. However, this very important consideration must be integrated into the design, engineering, fabrication, installation and operation processes right at the start of the project design. It should be addressed by creating an operating philosophy document that deals with the entire value chain and lifecycle of the project."

> "OPEX optimisation is best achieved by influencing the facility's design and engineering at an early stage."

Focusing on operational costs

For any project there needs to be a minimum viable product (MVP) with a focus on OPEX optimisation. "This is in part achieved through the conversion of the operating philosophy into a basis of design, thus ensuring that operability is considered and catered for in the end design," Young adds.

OPEX optimisation is best achieved by influencing the facility's design and engineering at the early stages of the project; changes can then be made with the lowest cost impact while, at the same time, maximising the design effect on long term OPEX. This is Marsol's operational engineering approach.

There are numerous components involved in ensuring the integrity of the system throughout its operating life including design life realisation, life expectancy and possible life extension. "All of these factors are considered as part of our basis of design inputs," Young

explains. “As an operating company, we are not only focused on sound design principles in order to optimise OPEX, but also to ensure sound design and component inputs to offer an underwritten long-term integrity management service.”

This is where Marsol’s Advanced Systems Integrity Management (ASIM) comes to the fore. ASIM uses data collection, analysis, holistic field condition data and methodologies (both physical and operational) to arrive at the optimum design for the site and service.

A continuous process of improvement should be present throughout the lifecycle of the project and not just at the design and engineering stages, as the Deming Cycle suggests. The Deming Cycle (also known as PDSA Cycle) is a continuous quality improvement model consisting of a logical sequence of four repetitive steps for continuous improvement and learning: Plan, Do, Study (Check) and Act). The old cliché of the only constant we have is change is very relevant here, as one needs to fully understand the implications of the changes, and adjust accordingly, as part of the integrity management regime.

“Over the last 50 years Marsol International has developed engineering solutions for the fabrication, commissioning and operation of offshore terminals and infrastructures,” Young continues. “During that period, we have increasingly identified and reengineered points of failure in many different systems. Some were generated by design and engineering, but many by the changing environmental conditions and by operational practices not suited to that particular facility.”

Controlling CAPEX

Although operating expenditure is crucial to a project’s success, the up-front capital expenditure (CAPEX) is equally important. Young explains, “It is true to say that a sound OPEX MVP is maximised by sound design and engineering at the CAPEX stage. However, if CAPEX is considered in isolation, OPEX can be negatively affected.”

This being the case it is vital to focus on design and engineering optimisation that not only takes into account the end goal and client requirements, but also considers expediency and cost-effective fabrication, material and component selection and installation methodologies.

Within the CAPEX there are separate cost drivers that should be identified and accommodated. Right from the outset, during the FEED process design, decisions should not be governed simply by minimising the design and fabrication costs. Consideration should include the cost of installation and operation, including preventative, and corrective and preservation maintenance principles. Young continues, “Assigning the responsibility for design and installation to an EPC contractor may facilitate the first step, but not the second; generally, the design has been approved already by the client before issuing the tender.”

An example of the above is the pipeline design: a pipeline needs specialist equipment, which in itself will require significant mobilisation and operating costs; at this stage, the advantages that could be gained by acquiring a more robust and costlier pipe (one that could eventually result in savings in installation costs and have potential for a longer lifespan) will have been forsaken.

It is the same principle as the OPEX optimisation model: First we need to take the operational philosophy, and resultant basis of design inputs, and then create a design, engineering and installation regime that encompasses all the requirements. It must optimise fabrication and installation costs while at the same time supporting the long-term integrity management service. “When all is said and done, a facility that has a reduced risk of failure allows the parties to offer and underwrite such a service,” Young says. “This approach then addresses not only the client’s requirements, but also the needs of the other stakeholders, as regards operability.”

A full lifecycle approach should result in optimised costs and operational efficiency over the life of a facility.

Image Credit: Marsol

> “Decisions should not be governed simply by minimising the design and fabrication costs.”

Minimum Viable Product (MVP)

Marsol have developed a holistic approach to CAPEX optimisation that has been established with a focus on SPM integrity management. This means that by combining the two skills sets the client can be offered a full turnkey solution from FEED to operations. This supports the owner, EPC contractor, OEMs and future operators.

“This approach allows the smooth transition from FEED to long-term operations and protects all parties’ interests,” Young adds. “This avoids costly and reputation damaging contractual discussions and disputes and replaces the blame game with sound technical solutions.”

ASIM was originally developed to address similar criteria at brownfield installations without the benefit of being involved at FEED or basis of design phase. “The principle of ASIM is to enter an existing field with the intent of establishing a holistic picture of the field and its operations,” Young says. “Then through the assessment of design criteria, historic information, new data and using experience gained on multiple sites, at different geographic locations, over extended periods of time, arrive at a site-specific integrity protocol.”

By adopting a rounded, full lifecycle approach it is possible to ensure that all stakeholders take an approach that optimises both cost and operational efficiency at the minimum acceptable risk level over the entire life of a facility. The result is a win-win situation for all concerned. ■

Different types of opportunities will arise for a more diverse group of employees, with women making up a larger percentage of the workforce.

The evolving oil and gas job market

Jon France, regional director, Petroplan and James O'Neill, client development manager, Petroplan, discuss current trends in the oil and gas job market in the Middle East.

Image Credit : Structuresxx/Adobe Stock

How do you view the oil and gas job market in the Middle East, currently, and how does it compare with other areas of the world?

The Middle East job market picked up in 2018 after a fairly slow 2016 and 2017 following the downturn. Across the region we have seen an upsurge in requests from clients for qualified technical personnel. We have also seen an increased demand for permanent hires due to clients having more of a push to increase their internal headcounts following a few months of stability in the market, increasing oil prices and the need to regain their internal skill sets in preparation for the increased workloads.

Do you see any particular countries and any particular sectors that are experiencing growth in demand?

Our office in Muscat, Oman experienced steady growth throughout 2018 on the back of an increased number of major projects either starting or entering the execution phase. The downstream sector in Oman in particular is currently growing rapidly, and qualified personnel with relevant experience in refineries and petrochemical complexes are in demand. Overall the UAE and Iraq have seen an increase from operators focused in exploration-based roles, and we are seeing an increased demand in EPC projects across these areas.

How do you see the job market evolving in the future?

There is a strong push on nationalisation in the region and this trend will continue, especially as employees gain exposure to newer technologies and different sectors of the energy industry such as renewables. Digitalisation, Artificial Intelligence (AI) and Machine Learning (ML) will also see changes to the traditional "core discipline" positions offered by employers, and we will see different types of opportunities for a more diverse group of employees. We are also seeing the way people are now utilising social media such as LinkedIn and Facebook to seek and promote employment opportunities, which has enabled candidates and clients to get a lot more visibility throughout the market place.

What are the main workforce challenges the region is facing?

Historically, the public sector has been the primary employer of GCC nationals, and expats have been hired to fill jobs and gaps in the private sector. The oil and gas sector faces a challenge in attracting the best local talent while also achieving more diversity in the workforce. The industry is still very male dominated but this is starting to slowly change in the Middle East, with women making up larger percentages of the workforce, particularly in areas such as supply chain and human resources. Also with the

drop in oil prices we saw a lot of highly experienced personnel leave the industry through retirement as well as career changes, and with this large demographic skills gap, the industry is more likely to experience some difficulties in attracting this level of experience back into the region due to the decline of expat packages.

What type of skills are in demand, and to what extent are skills shortages an issue?

We are seeing an increased demand for degree-qualified discipline engineers with design experience, project control personnel and senior drilling/subsurface personnel. Skills shortages are not really an issue as the global market is still recovering and oil and gas personnel laid off in the downturn are still available and are turning to work. As clients have more confidence within the market we are seeing increased permanent positions from operators within the exploration field, and more focus on candidates possessing regional experience.

Can you comment on salary levels in the region?

Following the downturn, salary levels dropped across the region as companies adjusted to the lower oil price and tried to remain competitive. We saw salaries and day rates increase slightly in 2018, but levels have not returned back to the pre-downturn highs that they once were. This will probably remain the case for some time as many engineering and service companies are conscious of remaining competitive. Another trend that has been seen across the region is a focus more on local packages, with the traditional expat packages no longer being offered by clients.

> “People are now utilising social media to seek and promote employment opportunities”

How successful do you think the region is in attracting and retaining personnel in the oil and gas sector?

Most Middle East locations are still viewed as attractive postings for expatriate workers. However, the erosion of traditional expat packages ie. large living allowances, schooling fees paid, flights home etc. in recent years has resulted in a number of expats returning to their home countries or moving on to other regions. In order to retain their local workforces, employers in the oil and gas sector need to be able to offer their employees training and genuine career progression, as talented locals are highly sought after by employers in the government and financial sectors. The retention of personnel within the region will depend on the oil price and how clients filter down their increasing profits into employee remuneration packages. We are already seeing candidates pushing for more competitive packages following on from increased opportunities in the market and the high cost of living within the region. ■

New approaches needed to avert oil and gas skills crisis

THE NEWLY-RELEASED THIRD annual Global Energy Talent Index (GETI), the world’s largest energy recruitment and employment trends report, shows that oil and gas businesses must continue evolving their approach to attracting and recruiting talent.

The report by Airswift and Energy Jobline, which provides insights into skills shortages and attracting talent, indicates that 48 per cent of oil and gas professionals are concerned about an impending talent crunch. Forty per cent of survey respondents believe the sector to already be in the grips of a crisis, with a further 28 per cent expecting one to hit within the next five years.

However, when asked whether they would pursue a career in the sector if they were entering the energy industry now, a large majority of oil and gas professionals said yes. Encouragingly, 81 per cent of those aged 25 and under remain enthusiastic about a career in oil and gas. While the pace of recruitment may have slowed during the downturn, it is clear that the quality of these efforts remains strong.

Image Credit : Airswift/Energy Jobline

Janette Marx, CEO at Airswift, says, “Having cut graduate schemes, apprenticeships and training during the downturn, the sector is playing catch-up. But it’s making good progress. And, most importantly, companies now realise that no matter what happens economically, they need to consistently invest in their talent strategies.”

Main findings within oil and gas include:

- Remuneration is on the up. Forty-one per cent of non-hiring professionals report an increase in pay over the past 12 months, with 21 per cent citing a raise of more than five per cent
- Sixty-five per cent of non-hiring professionals anticipate further pay rises in 2019. Hiring managers share their optimism, with 63 per cent expecting to see an increase
- 92 per cent of professionals would consider relocating to another region for their job, with the Middle East topping the list of preferred regions. Career progression opportunities are the number one factor attracting talent to a region
- Renewables remains the biggest source of competition for talent, with 42 per cent of those open to switching sectors attracted to the industry.

Hannah Peet, managing director at Energy Jobline, says, “Competition between sectors remains as fierce as ever, but oil and gas employers are well set to succeed.

“Leaders and hiring managers recognise that the world has changed and the desires of young people are different, with only 30 per cent of those aged under 25 believing that higher pay effectively attracts talent. The trick now is to respond by working to provide individuals with more opportunities to grow their careers, travel and work with new technologies.”

Airswift and Energy Jobline surveyed more than 17,000 energy professionals and hiring managers in 162 countries across five industry sub-sectors: oil and gas, renewables, power, nuclear and petrochemicals. The report is available to download at http://www.getireport.com/download-report.

Advanced surface logging for well placement

Michael Macdonald and Rabie Ali, GEOLOG, discuss the benefits of advanced surface logging and its applications in well placement.

THE MEASUREMENT AND monitoring of mud gas data and the collection of drill cuttings while drilling is a standard practice in mud logging during the drilling of both exploration and development wells. Continuous gas monitoring enables operators, in general, to indicate the presence of hydrocarbon bearing intervals in addition to safety purposes. The collection of cuttings allows for a basic geological study to be completed on-site while preserving the cuttings for additional potential analysis in the future.

A suite of services which extend beyond conventional mud logging to more advanced analysis, inclusive of: gas while drilling (GWD), cuttings while drilling (CWD), real-time isotopic analysis, flow monitoring and drilling optimisation, is available. These services are enabled by recent technological innovations in surface acquisition technology and have already demonstrated huge potential in improving the characterisation of reservoirs while providing operators with direct cost savings. The results, validated by correlation and comparison with other data such as downhole logs, well tests, PVTs, etc., have allowed for a new set of applications, such as:

- Well placement and geo-steering
- Gas/oil and hydrocarbon/water contact identification
- Vertical and horizontal heterogeneity in organic tight rock formations
- Reservoir zonation, fluid characterisation and maturity
- Vertical changes in fluid over a thick mono-layer pay zone

> “These surface datasets have proved to be key components of the integrated data model used in optimal well placements.”

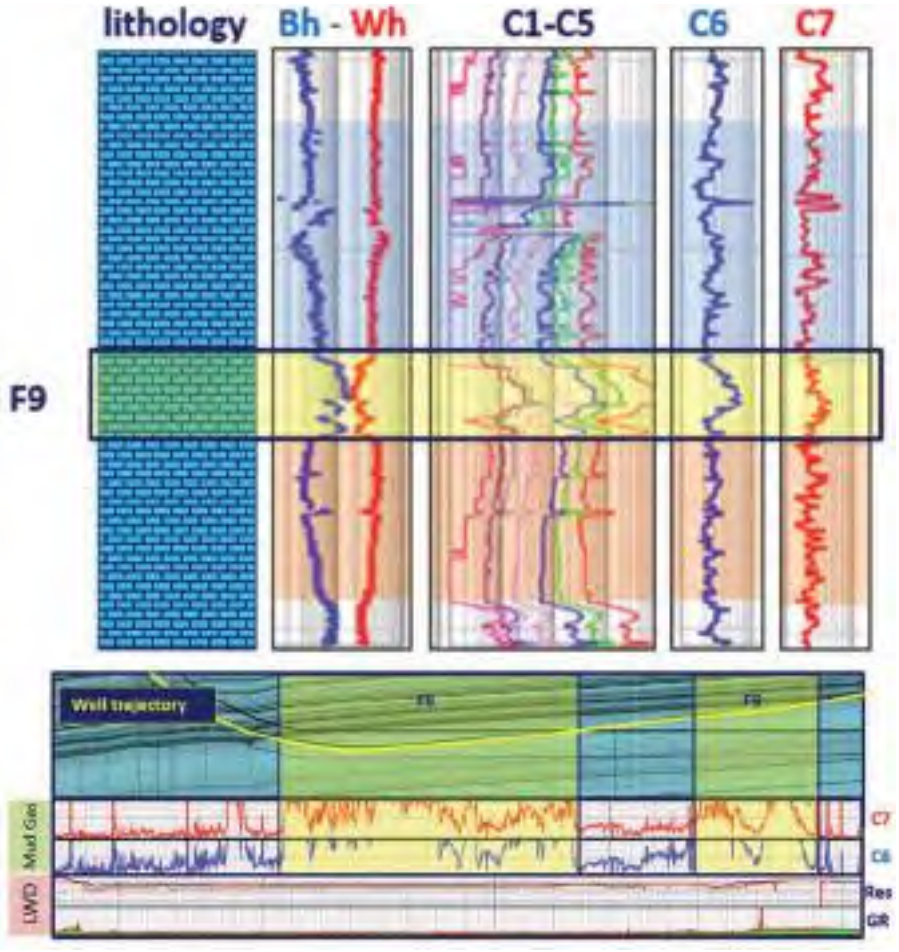


Image Credit : GEOLOG

Figure 1. Geosteering, using the mud gas data, along with LWD GR and Resistivity. Advanced Gas Detection System from GEOLOG, the G8.™

- Drilling optimisation (ILT), risk mitigation (NPT) and optimising well delivery.

Well placement traditionally refers to the real-time positioning of wellbores using measurements acquired mainly downhole. The term is often used in reference to directional or horizontal wells that are oriented to maximise contact with the most productive parts of reservoirs. Due to the economic advantages of maximising reservoir contact, horizontal and multi-lateral development programmes have quickly become the new norm in the Middle East and globally.

GEOLOG contributes to the challenge of well placement by providing near real-time analysis of either advanced mud gas data or the elemental and mineralogical signatures of the cuttings which return to surface (chemostratigraphy).

MASTERCLASS ON HR Metrics & Analytics

19th - 21st February 2019 | Dubai, United Arab Emirates

Accredited cpd
The CPD Standards Office
CPD PROVIDER: 21736
2018 - 2026

An intensive training course on how to effectively align human capital analytics with business and HR strategies to turn your HR data and metrics into actionable business intelligence.

Course Overview:

In order to add real value to an organisation, HR has to show that we are not just an expense - "a necessary evil". To do this effectively, we need proof, not anecdotal evidence or inferred cost savings, but instead, hard facts and numbers. Many HR departments find this difficult as they themselves are not in agreement as to what value they offer the organisation. In order to help HR do this there are two major questions that we need to answer:

- **What is the most important thing that HR is there to do?**
- **What should we measure to see how well we are doing it?**

The solution seems obvious, HR needs to learn to speak in quantitative, objective terms, using numbers to express their activity and the value it adds. This three day Training Course will explain how to do this and give you a framework for developing a set of HR measures and analytics to help show the real value of HR to your business. HR professionals will learn how to drive organisational change around human capital activities by linking evidence based data to business strategy and performance, as well as learn to apply HR analytics to a broad spectrum of human capital activities. From facilitating outcome-based conversations, to interpreting and benchmarking organisational results, this course provides HR professionals with hands-on expertise that will help to acquire the confidence needed to build consensus and acceptance around human capital measures that support operational goals.

Contact:
UAE: +971 4 4489260 | India: +91 8147053107
E-mail: training@alaincharles.com | Web: www.alaincharlestraining.com

In both cases, either through pre-drill analysis of offset wells or by analysing the data from a pilot hole, the mud gas and/or mineralogical/elemental signature of the target reservoir(s) are identified. These signatures can then be monitored from surface to ensure the well remains within the target zone. GEOLOG has deployed both of these methods in the Middle East and has been able to clearly demonstrate added value by reducing the number of downhole measurements and, in some cases, by providing the sole dataset used to place the well after downhole failures. These surface datasets have proved to be key components of the integrated data model used in optimal well placements in both conventional and unconventional reservoirs.

Figure 1 shows an example of one of the potential benefits of utilising mud gas data in well placement. While drilling a lateral well in Kuwait Oil Company's Middle Marrat carbonate reservoir, GEOLOG's G8™ service was utilised to complement the LWD resistivity and gamma ray readings. While drilling the pilot hole, the target reservoir was initially identified (F9). Once the lateral section commences, utilising the mud gas data, it is quite clear when the reservoir has been left. This is seen by the sharp drop in the C6 and C7 components of the hydrocarbons in the mud gas (between the highlighted zones in Figure 1). However, looking at the LWD resistivity and gamma ray in this case, there is very little movement. This is due to the increased cementation once the carbonate reservoir has been exited. In a case such as this, the mud gas data becomes invaluable in geosteering the well back into the zone of interest.

Gas ratio analysis has been used effectively for real-time gas evaluation. These ratios generally compare the relative quantities of the heavier components with the lighter

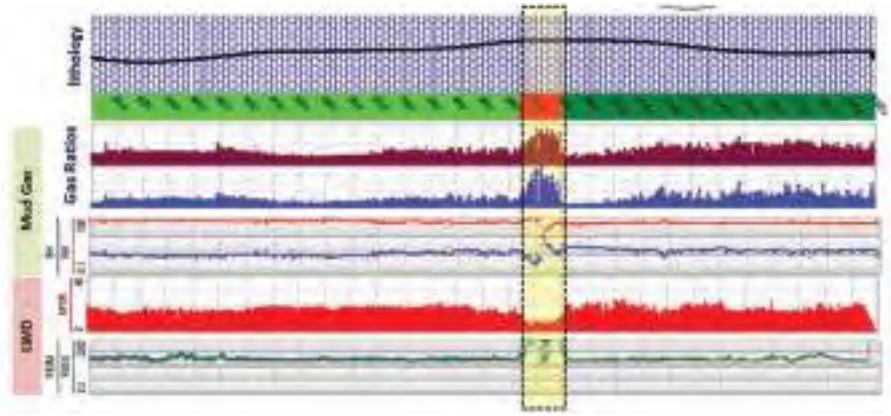


Image Credit : GEOLOG

Figure 2. Geosteering, using the mud gas data, along with LWD Porosity and Resistivity. Advanced Gas Detection System from GEOLOG, the G8.™

> "Versatile services and advanced technologies utilised in well placement have demonstrated substantial value to operators worldwide."

fractions, with different ratios corresponding to different reservoir and fluid types. Analysis of the different combinations of gas fractions can lead to fluid type identification and yield other significant information. Ratios bring out these indications by enhancing the aspects that are not easily picked up by visual examination of raw data. Figure 2 shows an example from a well drilled by Chevron in the South Fuwaris field located in the partitioned zone between Saudi Arabia and Kuwait. This lateral section was drilled through a sub-layer of the Rawati Oolite. Again, LWD is on the bottom and the GEOLOG G8™ mud gas can be seen on top. While in the previous example (Figure 1), the LWD resistivity did not provide a good indication that the reservoir had been exited, that is not the case here. When the tight upper ceiling is penetrated, the spike in resistivity is clear. This is matched by an equally large change in the mud gas ratios. In this case, the mud gas data provides an independent validation of the LWD data. Seeing this leaves no doubt of a potential tool failure and ensures that corrective action can be taken immediately.

Chemostratigraphy service provides detailed chemical and mineralogy rock characterisation on drill cuttings and core chips. A combination of X-Ray Fluorescence (XRF) analysis and X-Ray Diffractometry (XRD) measurements are obtained in near real-time at the well site. All key chemical, mineralogy, and geomechanical information are delivered within one to two hours of drilling through a formation, providing an extremely valuable and much needed alternative to the conventional long wait times for lab results and the costs associated with them.

Through a thorough pre-drill analysis of the Burgan formation in Kuwait, the elemental signatures of faulted zones were determined. As seen in Figure 3, tracking these signatures then supported the geosteering of the well through a relatively homogeneous sandstone sequence. The presence of faults dislocated the target, and the identification of specific chemical markers (in this case, zirconium, potassium, aluminum and titanium) with the GeoROX™ service helped not only to identify the faulted zones but also to isolate them in the production string to optimise overall production.

Versatile services and advanced technologies utilised in well placement have demonstrated substantial value to operators worldwide. In the Middle East, where more and more of the wells are drilled deviated, horizontal or extended reach (ERD), the need for integrated data will always be an added value to the operators. ■

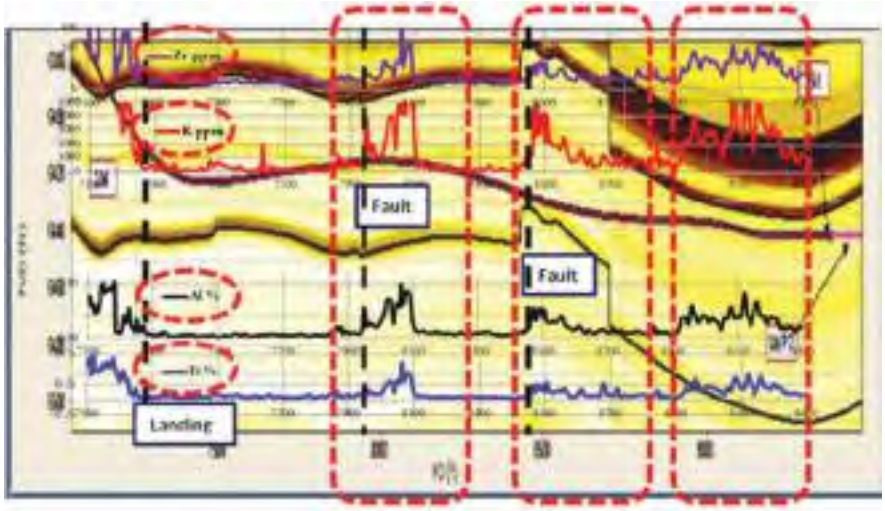


Image Credit : GEOLOG

Figure 3. GeoROX™ Service provides the elemental signatures used to identify the fault zones in the horizontal well.

FFS & Life Extension Study for offshore platforms

An Abu Dhabi oil firm turned to Tebodin ME to conduct risk assessment and fitness for service for more than 20 offshore platforms in the Gulf. Brooke Azem, product marketer, Structural Analysis, Bentley Systems, reports.

Bentley's SACS software can be used to model, analyse and design offshore structures.

TEBODIN MIDDLE EAST Ltd., part of the Bilfinger Tebodin company, is a consulting and engineering firm that offers consultancy, design, project management, procurement, and construction management in the oil and gas industry all over the world. An Abu Dhabi-based oil company retained Tebodin Middle East to carry out a Fitness for Service and Life Extension Study of 20+ offshore platforms located in the Arabian Gulf. The platforms include complex platforms, wellhead towers and flare towers, all of which were installed in the early 1980s. Given the age of the platforms, this study was expected to estimate how much longer the platforms could remain functional, and risk assessment and risk-based inspection (RBI) plans needed to be carried out. Furthermore, if the platforms' remaining lives were less than 20 years, strengthening and mitigation plans to extend their lifecycles needed to be deployed.

Tebodin conducted data collection, site survey, gap analysis, and reviews of design criteria in accordance with the latest edition of international standards and structural recommendations. The objectives on this US$312,000 project included the establishment of current stress levels per design standards, structural strengthening and mitigation designs to ensure life extension for the next 20 years. Additionally, Tebodin sought to perform spectral fatigue analysis of joints to establish joints life, pushover analysis to establish reserve strength ratio of the structures, and boat impact analysis to establish energy absorption during ship impact. The complete structural integrity assessment and life extension study, as well as the preparation of the RBI plans, needed to be completed within six months.

Tebodin faced its biggest challenge in having to complete the assessment and study within a constrained budget and timeframe. The organisation was able to meet these demands by utilising a unified and highly interoperable software solution to model and conduct the analyses, which saved 1,000 resource hours on the project. Tebodin deployed SACS, Bentley Systems' offshore structural analysis and design software, to successfully complete this project. The organisation used SACS to model the platforms and perform in-service analysis, which also incorporated the dynamic behaviours of the structure. This model was then used for pushover and boat-impact analyses, as well as spectral fatigue analysis, which assessed the remaining life of the joints. Conducting these analyses with varying strengthening parameters optimised the structural strengthening and mitigation procedures on the project. Tebodin was also able to incorporate site conditions into the analyses, streamlining the engineering process.

Image Credit : Tebodin Middle East Ltd

A SACS model of a complex offshore platform.

The project team performed 120 reports within a challenging schedule of 24 weeks. Requalifying platforms for 20 more years of service deferred the expense of new construction, saving the oil company up to US$15mn per platform. Moreover, accessing the SACS modules for collapse and fatigue saved Tebodin approximately US$50,000. This structural assessment was carried out without interrupting production from the platforms, guaranteeing cash flow for the oil company. Additionally, successfully extending the life of the platforms reduced global environmental impact, protected marine life, and saved the oil company significant costs. Overall, the structural evaluation of all 20+ platforms was critical, and it ultimately improved the safety conditions of the platforms. This safety enhancement was especially important on the living quarter platform, which accommodates more than 50 people. ■

The value of investing in high quality bolted joint integrity

Hi-Force, UK-based designer, manufacturer and supplier of hydraulic tools, discusses the importance of ensuring bolted joint integrity.

An average-size oil, gas or petrochemicals facility will contain in the region of 30,000-50,000 bolted joints.

Image Credit : Hi-Force

SINCE THE INVENTION of the bolt and nut around 400BC we have used them to join various components together in a wide variety of applications. Over the centuries, the technology and how it relates to bolted joint integrity has improved significantly. Whether this method of joining components together is simply for the purpose of assembly of component parts, for example a wheel to a bicycle, or for more sophisticated applications like a turbine rotor, the integrity of the joint, i.e. the consistent and sustainable "clamping force" generated within the bolt to maintain the two components together without risk of loosening and loss of joint integrity, cannot be underestimated. This is particularly relevant when bolted joint technology is used in pipelines, pressure vessels, valves and heat exchangers where hydrocarbons and combustible fluids and gases are processed and moved around. Bolted joints in such applications are usually of a flange design utilising a number of bolts in a circular pattern, in conjunction with a sealing material (gasket), to provide a clamping force to hold two flanges together, maintaining a leak-free condition.

Typically an average size oil, gas or petrochemical facility will contain in the region of 30,000 to 50,000 bolted joints, all of which have the potential to leak and create a risk to the plant, the environment and potential loss of life. Yes, some leaks could and do result in a minor, low risk incident, but others could lead to a catastrophic loss of life and assets, as well as major damage to the environment, within the local proximity of the plant. This can also easily escalate to the wider area, dependant on the location of the plant, with the inevitable damage to the reputation of all involved. History has shown us that major catastrophes can and do happen and the costs can run to millions and sometimes billions of dollars.

So why do we use bolting technology to join components together? Firstly, it makes the whole construction process easier to manage, secondly by bolting components together it provides the essential access required to carry out regular maintenance, or in the case of a failure of an individual component, it can be dismantled and removed in order that the failed component(s) can be repaired or replaced. Pipelines and pressure vessels that move and process hydrocarbons

need to be regularly cleaned and maintained, and this process is usually carried out during a planned maintenance shutdown or outage. Clearly the planning of this is key to ensure that a clear and defined work scope is prepared that includes all the necessary tooling and expertise required.

Image Credit : Hi-Force

Hi-Force offers complete on-site bolted joint integrity management.

Correct "bolt-up"

During construction and commissioning of new facilities, the issue of correct "bolt up" of critical and non-critical joints is often an oversight during the construction contractor bidding phase, which usually results in conflict between the plant owners, EPC contractors and construction sub-contractors around who is responsible for the cost and provision of the required bolting tools and the necessary expertise to carry out the bolting work. In many cases, due to a lack of available tooling and expertise, the construction contractors suffer from conflict with the pre-commissioning and commissioning teams, as a result of leaks from incorrectly assembled bolted joints during the construction phase and from incorrectly pre-assembled components, supplied by third parties, that only come to light during pre-commissioning and joint integrity pressure testing. Plant owners often apply severe penalties to the EPC contractors for late delivery of the plant, delays which in many cases are due to rework and rectification of leaking joints. It is generally agreed that improvement in bolted joint integrity is one of the most significant areas requiring attention, both on the site and at all levels of plant facilities management.

> "A mind-set of "First Time Right" is key to the success of the bolted joint integrity programme"

Improving the process

So how can the whole process around "bolted joint integrity" be improved and implemented, to help reduce the risks and costs related to loss of life, assets, environmental issues and project completion delay penalties? Firstly all parties involved need to change their mind-set and buy into the benefits of implementing the necessary policies and procedures required to deliver a comprehensive joint integrity programme at the respective project. This is particularly applicable to new-builds but can also deliver significant time and cost savings during shutdown maintenance, provided everything is planned in advance. A mind-set of "First time right" is key to the success of the implementation of the entire bolted joint integrity programme. Rework costs will always be multiples of the original assembly costs, so surely a significant reduction in rework is something everyone involved is keen to achieve?

As a major UK headquartered manufacturer, Hi-Force, with overseas regional offices in Holland, Italy, UAE, Saudi Arabia, Azerbaijan, Malaysia and South Africa, has over thirty years' experience in the design, manufacture, operation and use of manual, pneumatic and hydraulic bolting tools.

Hi-Force UK operates from a state-of-the-art manufacturing facility located in Daventry, England, that houses everything from product design, through to manufacture, assembly, testing and certification, of an extensive range of bolting tools, as well as many other types of high pressure hydraulic tooling. Hi-Force also offers full after sales and service support, through all of its strategically placed regional offices and authorised and trained distributors, in almost 100 countries worldwide. For many years Hi-Force has also offered clients short and long term tool rental, and in 2016 this service was formally extended to offering complete on-site bolted joint integrity management, during plant construction and maintenance shutdown activities.

The Hi-Force On-Site Bolting Services Division, managed from the Hi-Force UK Head Office, can now offer clients pre-start on-site surveys, full and comprehensive analysis of bolted joint needs and requirements, development of correct procedures, including all required bolted joint load calculations, on-site supervision, using ECITB qualified and trained supervisors, on-site bolted joint integrity training courses, for the nominated contractors technicians, full flange management control, utilising the Hi-Force BOLTRIGHT PRO calculation software and of course high quality UK-manufactured bolting tools. As part of the Hi-Force On-Site Bolting Services offering, the company is able to mobilise to site bespoke twenty foot containers, fully equipped, as either a bolting tool store, or a mobile on-site training facility, incorporating all the necessary training equipment, to deliver bolting training courses to the highest possible standard.

Group managing director of Hi-Force, Kevin Brown, is directly heading up this new division within the Hi-Force Group and comments, "Hi-Force is always looking to expand its offering to clients worldwide, and this new venture has already delivered significant results in recent months. We currently have four containers mobilised, two each to two different plant construction sites, and our clients are already seeing the benefit of employing a specialist bolting services company to manage all of their joint integrity needs at site. A further two bespoke containers have also recently been ordered. The issue of purchasing of capital intensive bolting tools is no longer a requirement for the site, because we are offering competitively priced tool rental throughout the project, with our own on-site tool service repair facilities, fully supported by readily available spare parts, to ensure bolting work is continuously carried out. Our on-site supervisors have all the necessary skills to supervise the bolting work, carry out bolting work when necessary, conduct high quality training courses at site and of course carry out any required tool service and repair work." ■

For further information on Hi-Force On-Site Bolting Services and bolted joint integrity management please go to www.hi-force.com.

The role of natural gas in the energy transition

Speaking at the Atlantic Council Global Energy Forum, Crescent Petroleum CEO Majid Jafar highlighted the role of natural gas in the energy transition to a low carbon economy.

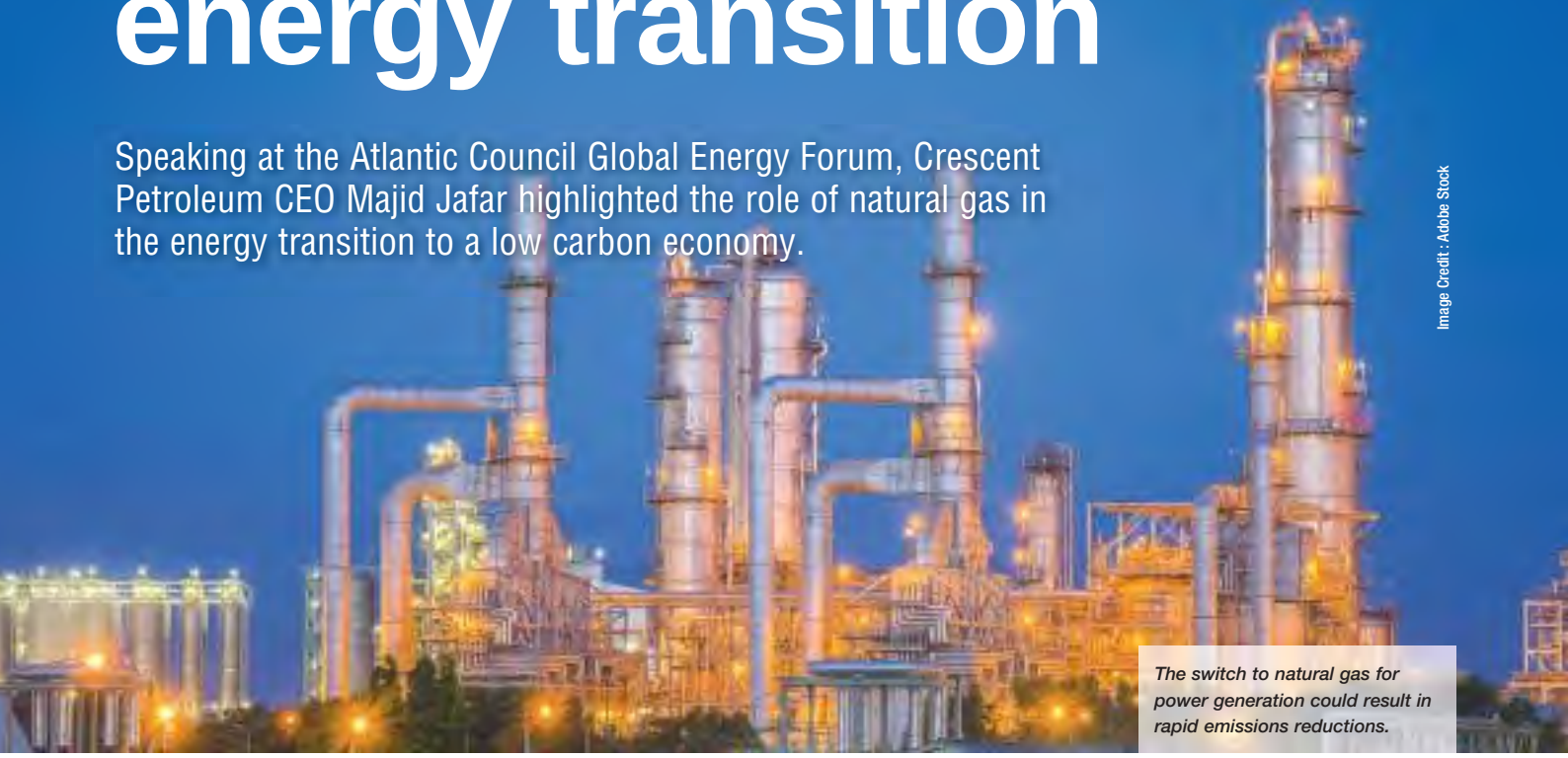


Image Credit : Adobe Stock

The switch to natural gas for power generation could result in rapid emissions reductions.

AS GLOBAL DEMAND for energy rises, natural gas is emerging as a fuel of choice for power generation in the 21st century, serving as a central ingredient in a more sustainable energy mix in combination with renewable energy sources such as solar and wind, Jafar said.

"The switch to natural gas from coal and oil for baseload power generation could result in the kind of rapid emissions reductions that are needed and could have a definitive impact on the global carbon footprint," he commented. "The growing use of natural gas has is estimated to have avoided over two billion metric tonnes of carbon dioxide between 2005 to 2016, and its impact will only increase as gas adoption expands in growing regions like Asia."

Speaking on a panel entitled "Setting the Energy Agenda for 2019" Jafar joined HE Suhail Al Mazrouei, Minister of Energy of the UAE, as well as Lisa Davis, managing board member and CEO, Energy, of Siemens AG in discussing the future of energy, OPEC and the latest developments and outlook for the industry worldwide.

"The Middle East and North Africa region contains almost half the world's proven reserves of natural gas but still only one sixth of global production, so the potential for growth is clear. Almost every government in the region and across Asia is looking to boost its gas supplies, much of it for internal consumption, as natural gas becomes synonymous with electricity generation and fuelling industry for economies with growing populations and energy needs."

> "The Middle East and North Africa region contains almost half the world's proven reserves of natural gas."

Forward looking governments have embraced the changeover from coal or oil to gas as an opportunity. He cited, for example, the UAE's announced national energy strategy, which targets that by 2050 the power generation needs of the country will be supplied around 40 per cent each by natural gas and renewables.

Policymakers around the world will continue to grapple with slowing, if not reversing CO2 levels. To be truly sustainable, energy solutions must be affordable, reliable and scalable, while contributing to lowering global carbon emissions. And oil and gas companies must confidently show the way forward and embrace their role as central players in the debate.

"In a rapidly changing world, this transition must be approached as an opportunity and not a threat," he said. "The future of the industry, and indeed that of sustainable energy supply worldwide, depends upon it."

The Atlantic Council Global Energy Forum, convened in partnership with the Ministry of Energy & Industry of the United Arab Emirates, Abu Dhabi National Oil Company (ADNOC), and Mubadala Investment Company, with Crescent Petroleum as Platinum Co-Chair, took place from 12-13 January in Abu Dhabi as part of Abu Dhabi Sustainability Week. It saw regional and global policymakers and industry leaders gather to discuss the geopolitical and economic impact on the energy agenda.

This year's forum focused on four major themes: the future of oil, digitisation of energy, diversification within energy companies and countries, and a regional focus on east and southeast Asia. ■

3rd EDITION REFRIGERATION CONFERENCE 2019

Conference - 24 February 2019

Masterclass Training - 25 February 2019

Dubai, UAE

REFRIGERATION

for the Food Manufacturing, Packaging and Distribution Industry

Researched & Developed by

TECHNICAL REVIEW MIDDLE EAST

FOR MORE INFORMATION AND TO REGISTER:

UK: +44 20 7834 7676 **UAE:** +971 4 448 9260 **INDIA:** +91 8147053107

E-mail: register@technicalreview.me

www.refrigeration-forum.com

Engineering out human error with automation technologies

New drilling and well construction automation technologies are engineering out human error and bringing cost, efficiency and safety benefits.

WEATHERFORD LAUNCHED VERO automated connection integrity at ADIPEC, where it attracted a lot of interest. Speaking exclusively to *Oil Review Middle East*, Dean Bell, the company's president of Well Construction, commented,

"This is the most disruptive technology w've ever released in the tubular running services industry or product line. We're taking what was the current status quo in that product line and bringing AI, automation and digitalisation into this space. In this industry we often haven't done that as well as we should.

"There are two things that enable Vero. One is Automakeup, that autonomously controls the tubulars that are permanently installed in the well. So the make-up is done with automation, rather than using human judgement to decide whether those connections are made up properly.

"The evaluation of the torque when it's completed is also done autonomously with automation, engineering out human error. That's where digitalisation comes in, because a lot of data analytics went into evaluating all the types of connections.

"One of the main value points of Vero is that it reduces the risk associated with well failure from improperly made up connections, saving non-productive time and avoiding huge remediation costs which can run into tens or even hundreds of millions of dollars if it involves the workover of an offshore well.

"It also helps to mitigate safety risks. Because we automate the process, we eliminate people from that high risk environment on the rig floor. That has value everywhere, regardless of the cost of the operating environment.

"Vero also offers cost savings in terms of reducing wasted pipe, which can be very expensive. Here in the Middle East a number of operators run high strength chrome, where the cost of a string of completion pipe could be US$15mn dollars. Many of the operators send as much as 15-20 per cent extra pipe to the site, with the logistics expenses and risks of damage and loss that entails.

"The other benefit is general efficiency. A crew doing things the traditional way can run a connection as fast as Vero, if it's properly made up. But there is always variance in behaviour. By simply eliminating the variance in human behaviour we can save 10 per cent makeup time.

"With existing systems in the market the variance from the original equipment manufacturer (OEM) specification is 20 per cent. Vero stops perfectly at the torque and reduces the variance from 20 to two per cent away from the OEM-specified torque.

"The point about Vero is it's all about the connection, not the types of equipment used to make up the connection. We have various types of make-up system that are going to be Vero-enabled."

Vero has been successful trialled in Saudi Arabia, Azerbaijan, Qatar and the North Sea, with jobs soon to take place in Oman, Brazil and the Gulf of Mexico.

> "Vero reduces the risk associated with well failure from improperly made up connections."

"We were able to tweak the algorithm associated with the automatic make-up through testing in real time," added Bell. Record run rates were recorded in the North Sea, with more than 1,200 connections in completions made up, and a rate of zero rejected connections, zero laid down joints and zero damaged connections have been achieved on recent jobs following the test period, said Bell.

Efficient and safe pipe tripping

ENSCO launched its Continuous Tripping Technology™ in December 2018, a new proprietary solution that provides more efficient and safer pipe tripping and helps to lower customers' offshore project costs. The patented Continuous Tripping Technology, in concert with other key equipment, sensors and process controls, fully automates the movement of the drill string into or out of the well at a constant controlled speed. When deployed during offshore activities, it enables pipe-tripping speeds of up to 9,000 feet per hour – up to three times faster than tripping times achieved by current conventional stand-by-stand methods.

Continuous Tripping Technology can be retrofitted to both floaters and jackups, and is particularly well-suited for ultra-deepwater drillships and larger modern jackups. Ensco recently completed the installation of Continuous Tripping Technology on ENSCO 123, and commissioning of this system is currently underway. Upon completion of the system's commissioning and the rig's acceptance testing, ENSCO 123 is expected to be delivered in March 2019.

President and CEO Carl Trowell said, "Continuous Tripping Technology is a step-change efficiency improvement that uses automation and innovative technology to address a repetitive, time-consuming process that is ubiquitous in offshore projects today. Tripping pipe is on the critical path for all drilling and workover activities and, as a result, meaningful time is spent performing this process over the life cycle of every offshore well. Continuous Tripping Technology significantly reduces the amount of time spent tripping pipe, and the faster tripping time that this technology offers is expected to lead to cost savings for customers regardless of water depth or well type."

In addition to increased efficiencies, Continuous Tripping Technology makes the pipe-tripping process safer by using automation to eliminate human error and personnel exposure associated with the conventional stand-by-stand method. Furthermore, the constant speed that the technology delivers has the added benefit of minimising surge and swab pressure on the wellbore by eliminating intermittent stopping and starting as well as excessive peak speeds that typically occur when using current industry practices. ■

MultiFlame detectors certified SIL3

AMONG 3M GAS & Flame Detection's wide range of gas and flame detection equipment is the MultiFlame series DF-TV7-T. The first triple IR flame detector on the market certified up to safety integrity level SIL3, the device is in compliance with IEC 61508:1-7 and abides by stringent functional safety assessments.

The MultiFlame DF-TV7-T series flame detector provides fast and accurate detection of hydrocarbon fires while ensuring reliable false alarm immunity. Based on a multi-infrared spectrum (3IR) technology, the detector provides one of the longest distance-to-detection ranges on the market (260 ft for n-Heptane). In addition, the 3IR detectors are highly sensitive to fire, and ideal for use in dirty environments and for smoky fires.

Image credit: 3M

The MultiFlame DF-TV7-T series flame detector

Also available in the MultiFlame product line is the DF-TV7-V, a UV/2IR version certified for use in SIL2 applications. The MultiFlame DF-TV7-V uses combined ultraviolet/infrared optical technology that provides industry-leading immunity to false alarms based on the two IR channel design. Both solutions lead to a very efficient false alarm rejection while keeping optimum sensitivity to fire.

All MultiFlame detectors are equipped with a continuous optical lens auto-check to ensure that the optical path is clear and that the detector functions properly. Sensors can be replaced easily in the field without removing any cable glands.

Each detector is constructed as follows:

- A stainless steel (316L) explosion-proof housing contains a set of tropicalised electronic cards as well as a display and infrared communication electronic card allowing communication with the remote control (TLU600)
- The sensor cartridge contains the flame detection circuitry, so it is possible to change the cartridge easily. The multispectrum IR detector is also available in a high sensitivity version.
- An IR communication head is located below the detector housing. It is used for communication with the maintenance hand-held terminal (TLU).
- A metallic support cable (optional) connects the wall mounting support and the housing, making maintenance easier.

The MultiFlame DF-TV7-V flame detector

Image credit: 3M

For more information on the company's range of products and services, email: gasandflamedetection@mmm.com or check the website at http://gasdetection.3M.com

Crowcon launches high-temperature sensor providing H2S detection for oil and gas industry

TO SUPPORT THE oil and gas industry in the Middle East, Crowcon has developed a high-temperature hydrogen sulphide (H2S) sensor to work alongside its XgardIQ fixed point detector and transmitter.

Ala Ayoub, regional general manager at Crowcon, explains, "The Middle East oil and gas industry contends with high levels of H2S in their gas production operation. More recently, oil production is experiencing increased risks from H2S gas, as they extract more, heavier oils. Employees working in these extreme conditions need reliable, effective equipment to help minimise risk."

Image credit: Crowcon

The new H2S sensor

Detection of H2S and protection of workers is a high-profile safety issue at well heads, and further down the pipeline (unless the gas or oil has been 'sweetened'). Hydrogen sulphide is a highly toxic gas which is lethal at 1,000 parts per million (or 0.1 per cent). Traditional H2S sensors do not survive well in the hot, dry environments, increasing the risk of an accident.

Crowcon has developed a sensor capable of operating at 70°C, improving on electrochemical technology to produce a sensor to retain moisture levels, so preventing evaporation of the electrolyte, even in the harsh Middle Eastern climate.

Crowcon's new HT H2S sensor works with the XgardIQ. The optional remote sensor housing means the sensor can be installed for optimal leak detection, while the transmitter's display screen and push-button controls are located for easy and safe to access, up to 15m away.

The technology reduces expensive maintenance downtime, according to the company. A combination of high temperatures and low humidity can cause the electrolyte to dry out in the traditional sensor design, impairing performance so they must to be frequently replaced. This incurs excessive costs in replacement sensors and in the time and manpower. The new sensor avoids this occurrence.

New H2S gas detector watch

FOLLOWING MORE THAN three years of research and development, and in response to customer demand, North Eagles has launched the World's first Swiss watch specifically designed for the oil and gas industry, with H2S detector built into a smart watch.

Using the latest generation of electrochemical sensors, the H2S detector watch, engineered and manufactured in the village of La Neuveville, Switzerland, combines ergonomics and readability and is stamped with the Swiss Made quality label. The Watch connects digitally to a mobile device and comes with a free app download.

If the watch detects a certain concentration of H2S, it vibrates, flashes an LED light, and sounds a 96db alarm. The gas detector watch can transmit the alarm directly to the control room via a smartphone or using the company's SmartNetwork technology. The watch is able to directly transmit the user details, its geolocation on the site, the gas concentration and the time of activation.

It can operate in temperatures ranging from -40 to +70°C.

The watch has a replaceable four-year sensor and battery and conforms to ATEX, IECEx, UL and CE standards.

Tenaris acquires stake in Saudi Steel Pipe

TENARIS HAS ANNOUNCED that it closed its previously announced acquisition from a private group of 47.79 per cent of the shares of Saudi Steel Pipe Company (SSP), a welded steel producer listed on the Saudi stock market, for a total amount of SAR 529.8mn (approximately US$141mn).

SSP's facilities are located in the Eastern Province of the Kingdom of Saudi Arabia (KSA) and have a manufacturing capacity of 360,000 tons per year. The company, which started its operations in 1980 and serves energy, industrial and commercial segments, is qualified to supply products with major national oil companies in the region, including Saudi Aramco.

Tenaris will begin consolidating SSP's results from January 21, 2019 and together will have more than 1,000 employees in Saudi Arabia. Tenaris has been serving the Saudi market for decades, and the combined portfolios coupled with the strengthened technical capabilities will allow Tenaris to better meet customers' requirements.

The result of the transaction is expected to expand Tenaris's industrial presence in Saudi Arabia, one of the largest markets for OCTG and line pipe products, and the range of products it supplies to Saudi Aramco. Since its first industrial investment in Saudi Arabia in 2010, Tenaris has continuously invested in the expansion of its local operations, supporting the industrialisation of the country.

"The official integration of Saudi Steel Pipe into Tenaris marks an important step to further expand the company's footprint and capabilities in Saudi Arabia," said Mariano Armengol, who has been appointed as managing director and CEO for SSP. "I would like to recognise the efforts of both Tenaris and SSP teams who contributed to the successful closing of this acquisition. We are very positive to what the future holds in terms of business growth and people development."

Commenting on the acquisition, Ahmed Al-Debasi, SSP's former managing director and newly appointed chairman of the Board of Directors said, "We are pleased to join Tenaris, a global leader who shares our industrial legacy, our commitment to customers and our willingness to contribute to Saudi Arabia's oil and gas development. The integration will strengthen our technical capabilities, allowing us to better meet customer requirements and become an industrial hub for the region."

Image credit: Tenaris

The Tenaris facility in Saudi Arabia.

SSP operates five pipe production lines, covering an outside diameter range from ½" to 20" outside diameter which complements Tenaris's existing offering in Saudi Arabia. Tenaris' premium OCTG threading facility in Dammam covers a range from 4½" to 14" for the threading of full length pipes and accessories, with an annual capacity to produce 120,000 tons. The combined portfolio will provide Saudi Aramco and regional customers with a comprehensive range of products including welded pipes, commercial pipes and a full range of line pipes, as well as expanded services offer incorporating coating and bending.

Cortec introduces the next generation of corrosion-inhibiting fuel additives

APPLYING A GOOD corrosion inhibiting additive to fuel tanks and systems is an important part of the preservation process, especially when vehicles, tanks, or equipment will be going through a period of disuse. Otherwise, harsh environments and stagnation can lead to sludge formation and the deterioration even of new metal components.

Cortec has developed the next generation of VpCI® fuel additives for more potent corrosion protection of fuel systems. Cortec VpCI-707 has been specially formulated to protect fuel tanks and systems from corrosion and sludge formation without damaging copper and aluminum. It is a powerful option for keeping new and existing fuel tanks and systems in good condition during day-to-day operation and especially during vulnerable times such as intermittent operation, storage, or shipment. Other benefits of VpCI-707 are its improved water handling and good injector-cleaning capabilities. VpCI-707 does not contain trace metals, chlorides, chromates, nitrites, phosphates, or secondary amines.


Image credit: Cortec

VpCI-707 can be used in applications such as fuel storage tanks.

Because of its combined contact-phase and vapour-phase action, VpCI-707 effectively provides corrosion protection to metal surfaces not only in direct contact with the treated fuel, but also in the void space above the fuel line. This means it be applied at a very low dose compared to the volume of the tank being protected. VpCI-707 can be added directly to gasoline or diesel fuel in blending, storage, or vehicle tanks. It can also be fogged as a concentrate into dry fuel tanks before storage and shipment.

VpCI-707 can be used for fuel stabilisation and corrosion protection in applications such as large or small fuel storage tanks; heavy equipment or vehicles being shipped overseas; equipment operating in harsh industrial or offshore environments; generators or other equipment going into seasonal storage; and industrial plants going into temporary layup.

MIDDLE EAST ELECTRICITY

ENERGISING THE INDUSTRY

5 - 7 MARCH 2019 | DUBAI WORLD TRADE CENTRE, UAE

44th EDITION

21,000+ VISITORS

130+ COUNTRIES REPRESENTED

60+ EXHIBITING COUNTRIES

80,000+ SQM

1,600+ EXHIBITORS

REGISTER FOR FREE

www.middleeastelectricity.com

#MEE2019

SABIC joins new alliance to end plastic waste

SAUDI BASIC INDUSTRIES Corporation (SABIC) has joined the 27-firm Alliance to End Plastic Waste (AEPW), which works on finding advanced solutions to limit the misuse of plastic waste.

SABIC has also developed a project that aims to recycle low-quality mixed plastic waste to turn it into feedstock for the company's steam crackers in Europe.

SABIC vice-chairman and CEO Yousef Al-Bunyan said that the use of plastic facilitates modern life. Yet, the most beneficial products might become harmful if misused or not eliminated properly.

"Through this alliance we wanted to clarify global companies, which produce and use plastics, can be part of the solution," Al-Bunyan added.

Image credit: Adobe Stock

The alliance will be a stand-alone, not-for-profit organisation composed of companies from across the plastics and consumer goods value chains.

Solving the environmental problem stemming from plastic waste requires society's joint efforts and a strict commitment by consumers, manufacturers and those developing new techniques, Al-Bunyan stressed.

AEPW will make investments and drive progress in infrastructure development to collect and manage waste and increase recycling; innovation to advance and scale new technologies that make recycling and recovering plastics easier and create value from all post-use plastics, as well as education and engagement of governments, businesses, and communities to mobilise action.

RESMAN and Tracerco agree patent licence deal

RESMAN AS AND Tracerco, part of Johnson Matthey Plc, have mutually agreed to discontinue litigation. The two companies have entered into a global patent licence agreement under which Tracerco will have access to RESMAN'S inflow monitoring patents.

Both RESMAN and Tracerco provide essential reservoir monitoring services enabling oil and gas companies to maximise efficiency and hydrocarbon recovery.

Reservoir director Paul Hewitt commented, "Tracerco's industry-leading hydraulic frac, acid stimulation and interwell tracing technologies, together with inflow technology, delivered through our global network using in region engineering expertise will provide our customers with enhanced insight into reservoir performance."

Hewitt added, "We create value for our customers through the development of innovative technologies to offer cost effective alternatives to traditional methods of gaining critical data, allowing overall lift costs to be reduced. Entering into a patent licence agreement with Resman provides an opportunity for us to grow our offering as we strive to solve customer measurement challenges with innovative thinking, and service excellence."

Total exhibits SeaExplorer at World Future Energy Summit

THE SEAEXPLORER UNDERWATER glider attracted a lot of attention on Total's stand at the World Future Energy Summit (WFES), held from 14-17 January in Abu Dhabi.

The SeaExplorer underwater glider is a powerful autonomous sensing platform designed to collect water column data profiles with very wide spatio-temporal coverage (thousands of km and weeks to months of endurance). Driven by buoyancy changes, the vehicle glides up and down the water column while collecting physical, chemical, biological and/or acoustic data depending on the fitted sensors.

Oil Review Middle East

SeaExplorer at the Total stand.

The SeaExplorer glider is a very cost-effective solution for data collection as it reduces reliance on large vessels with high daily running costs: no surface supervision boat is required during the mission. The SeaExplorer is easy to operate and can be deployed and recovered by reduced crews in coastal waters using small boats.

Guy Zahan, Total's external events project manager, explains that the device can analyse oil and gas content in water, and when it detects oil is able to determine whether it is natural oil coming from the earth, or if it is from an oil spill.

"There is no engine, and during its lifetime of three or four weeks it navigates the course it is set and gives us all the information it obtains. This is something first made for oceanographic and defense purposes, but we are turning it into a tool for the oil and gas industry. It is a smart way of turning something to pure civilian purposes."

Real-time cavitation detection system from Yokogawa

YOKOGAWA ELECTRIC CORPORATION'S new cavitation detection system provides an early indication of conditions that can result in degradation in pump performance. By detecting problems early on, before damage occurs that can cause an increase in both vibration and noise levels, this solution improves the efficiency of plant maintenance.

Cavitation in fluids can cause damage to pumps. Until now, there has been no way to quantify cavitation since it occurs inside the equipment. It is usually detected by field personnel who rely on know-how gained on the job to detect changes in vibration and noise levels that are caused by excessive cavitation. However, even an experienced specialist can miss these early signs, and such problems may go undetected until the inevitable increase in vibration and noise occur.

The system that Yokogawa has developed consists of a STARDOM FCN-500 network-based control system, a Yokogawa cavitation detection logic programme, and DPharp EJX110A differential pressure transmitter, that relies on the FOUNDATION Fieldbus industrial digital communication standard to link these components.

At 100 ms intervals, the DPharp transmitter measures the pressure inside the target equipment, and this data is transmitted via the fieldbus network to the STARDOM FCN-500 system for processing in real-time by the logic programme. This system is able to detect cavitation issues early on, enabling field personnel to take quick remedial action.

This tool contributes to efficient operation and maintenance of the plant by detecting and making "cavitation" visible which is one of "production obstacles" that hinders plant operation from the information of the field device. This uses the pressure information of the field device, so cavitation can be detected earlier.

Valves, pumps, and other types of plant equipment can experience cavitation caused by opening/closing of a valve, change in viscosity level or some other physical property of a liquid, or a change in the external environment. Field personnel have conventionally relied on their own know-how and the use of analytical tools to find out what is causing these problems. Thanks to the development of this new system, field personnel now have a tool that will help them troubleshoot problems with greater efficiency by identifying and quantifying cavitation in plant equipment.

Researched & Developed by

TECHNICAL REVIEW MIDDLE EAST

4th EDITION REFRIGERATION CONFERENCE 2019

Conference – 25 March 2019

Masterclass Workshop – 26 March 2019

Manama, Bahrain

REFRIGERATION

for the Food Manufacturing, Packaging and Distribution Industry

Supported by

المجلس الأعلى للبيئة
Supreme Council for Environment

KINGDOM OF BAHRAIN
Ministry of Industry, Commerce and Tourism

FOR MORE INFORMATION AND TO REGISTER:

UAE: +971 4 448 9260 **INDIA:** +91 8147053107 **E-mail:** register@technicalreview.me

www.refrigeration-forum.com

Two new screw pumps from KRAL for tank terminals

AUSTRIA-HEADQUARTERED KRAL AG launched its Z Series, a new line of two screw pumps specifically designed for use in the tank farms and tank terminals for the oil and gas industry.

In this market, screw pumps are becoming increasingly popular because their flow rate can easily be controlled by the engine speed and pumping media with different viscosities and high gas fractions can be conveyed. They are capable of delivering contaminated, aggressive and low- or non-lubricating media. These technical advantages reduce operating costs and make screw pumps more viable for the oil and gas industry.

Image credit: KRAL

The KRAL Z Series is specifically designed for the oil and gas tank farm and tank terminal market.

These new KRAL screw pumps feature an unlimited variability to arrange inlet/outlet connections and thus offer maximum flexibility for connections. Existing systems often have limited options for arranging the pump. Using the KRAL Z Series, the user can freely choose how to arrange both suction and pressure flanges. All the connections can be arranged either for horizontally or vertically installation inline at several angles.

The innovative delta shape of the pump housing allows a very good suction performance and best dry running properties, even with a gas content of up to 80 per cent. The housing is standardised. This simplifies warehousing and speeds up spare parts delivery.

The series Z screw pumps by KRAL feature significant advantages in service. Thus, multi-part rotors can be braced with little effort and without loss of quality on site which reduces the downtime of the systems and saves costs. Due to the type of bracing, the rotor can be loaded higher.

Unlike other products in the market, the KRAL Z Series offers adjustable screw design. This enables the pumps to be used in a very broad range of applications. The KRAL Z series can be designed with one-piece or multi-piece screws. Thanks to parts reduction, one-piece screws offer considerable cost benefits, whereas multi-piece screws have the advantage that combinations of different metals can be used. For example, a combination of steel and bronze can be used to convey salt water.

Tendeka secures AICDs contract to boost oil recovery

INDEPENDENT GLOBAL COMPLETIONS service company Tendeka has secured another multi-million-pound contract with a major national oil company in the Middle East.

The agreement will see Tendeka provide reservoir modelling and the installation of its FloSure autonomous inflow control devices (AICDs) to boost production and improve reservoir performance in several mature fields.

Tendeka will perform reservoir simulations for each well, working closely with the client to ensure optimum reservoir performance, with the technology helping in the reduction of unwanted fluid production.

Image credit: Tendeka

Scott Watters, chief operating officer at Tendeka

Having carried out several similar projects in the region, the company has vast experience of the challenges of brownfields and carbonate reservoirs that form a large proportion of oil fields in the Middle East.

Scott Watters, chief operating officer at Tendeka, said, "This is a major contract for the business and one that continues a long and well-established relationship with the client. We are renowned for our FloSure technology with a strong track record in supporting clients and driving efficiencies.

"Our FloSure technology and global supply chain capability has allowed us to bring real value to major Middle East projects. We are committed to the continuous development of this technology to tackle future challenges and smooth field development planning for the long term. It is an area we aim to grow over the coming months and years."

Tendeka has installed more than 7,000 passive ICDs and more than 28,000 autonomous ICDs globally.

JDN air hoists make for safe and reliable lifting in tough environments

THE JDN PROFI range of air hoists are known for their robust design, a characteristic that makes them suitable for tough industrial applications, even in continuous working processes. Safety features, such as duty rating and explosion protection, are important advantages when working in hazardous areas. In line with customer requirements, various control systems are available, including remote controls and while for traversing loads, different trolley designs can be specified.

The air hoists are now deployed in applications that range from chemical – including pharmaceutical, paints and varnish, foundries, and food and beverage, to list few. In such industries, the design attributes of Profi hoists are proven that they can perform safe, high-performance and cost-effective lifting and lowering operations.

Unlike electricity, compressed air does not generate sparks, while overload protection is available and is often provided as standard. The chain and hook are manufactured from high-quality tempered steels with a breaking strength some five times the nominal load.

Carrying capacities from 250kg to 100 tonnes can be accommodated by Profi series air hoists, with four or six bar pressure compressed air. As standard, sensitive, infinitely variable speed control allows the precise positioning of loads, a function that is supported by frequent switching and extended duty cycles. Simple operation, sound absorption and suitability for lube-free operation are among further benefits of these low-headroom, lightweight hoists.

Low maintenance is another attribute of the Profi series, and remains insensitive to dust, humidity and temperature (from -20°C up to +70°C). In addition, the chain sprocket in the mid-section runs in dustproof, maintenance-free ball bearings, while the planetary gear, featuring teeth made from tempered or hardened high-grade steel, is lubricated with grease.

In chemical and pharmaceutical sectors, Profi air hoists lift and transport raw and finished goods, as well as auxiliary equipment such as submersible pumps, big bags and mounting tubes. Explosion-proof operation is clearly paramount in such operating environments. Here, Profi hoists offer explosion protection as standard, providing sensitive lifting and lowering, complemented by insensitivity to fumes and other environmental influences.

Blockchain-based oil and gas trading platform launched

PERMIANCHAIN TECHNOLOGIES HAS launched the prototype of its platform for trading potential oil and gas reserves that have yet to be developed.

The platform, being developed on IBM's Hyperledger Fabric, takes a blockchain-based approach using the PermianToken (XPR) to put a value on potential oil and gas reserves and a market where these tokens can be traded securely and transparently. By digitising oil reserves, it becomes far easier to get a comprehensive understanding of a project's viability and current status. The approach will also dramatically reduce the administrative costs involved in a trade, creating savings that could potentially change the status of marginal fields.

Image credit: Adobe Stock

PermianChain's blockchain-based approach will make it easier to put a value on reserves before they have been produced, enhancing efficiency and improving understanding of a project's viability.

The Permian platform is built around five integrated pillars which have been tailored to support different aspects of oil well developments, investment and trading processes.

"The crypto asset-class has inevitably become an integrated part of the global financial markets, and the blockchain economy is becoming more and more important. At the same time, the oil and gas industry has reached a critical point where it needs to find new efficiencies and ways of assigning value," says Mohamed El-Masri, co-founder of PermianChain Technologies. "The introduction of new sources of energy from shale gas, tight oil or coal seam gas creates an opportunity to examine how we trade before the current inefficiencies become entrenched. PermianChain will help generate early revenues for suppliers, provide higher discounts to buyers and increase value across the industry, complementing rather than disrupting the way that businesses currently operate."

PermianChain Technologies is working closely with King & Spalding to license the PERMIAN platform and have PERMIAN Token (XPR) issued as a regulated crypto asset-class.

Forum Subsea Technologies introduces electric ROV

FORUM SUBSEA TECHNOLOGIES has launched XLe Spirit, the first observation-class remotely operated vehicle (ROV) to utilise Forum's Integrated Control Engine (ICE) to bring greater functionality commonly only found in larger work-class vehicles. The advanced control electronics pod fitted to all Forum XLe observation class vehicles enables superior connectivity and expansion capabilities. Ethernet interfacing allows for seamless integration with other industry sensors using common IP architecture and ease of remote data transfer.

Image credit: Forum Subsea Technologies

The XLe Spirit electric ROV

Kevin Taylor, VP of Subsea commented, "As the subsea market continues to recover from a sustained downturn, cost efficiency is high on the agenda for the industry. Forum recognised the opportunity to apply our leading software to a more compact vehicle to enhance capabilities and meet the changing demands of the sector. By utilising the same system across all vehicles, pilots only have one interface to learn as the skills are transferrable between the smallest observation vehicle and the largest trenchers."

The XLe Spirit incorporates a number of features to maximise its stability for use as a sensor platform, including regulated propulsion power, optimised thruster orientation and location, accurate thruster speed control and a wide range of auto-functions for positioning and flying.

The XLe Spirit will be sent for sea trials in the first quarter of 2019.

Tracerco launches new measurement solution

TRACERCO HAS LAUNCHED HyperionTM, the latest addition to its nucleonic instrumentation portfolio. Hyperion is a non-contact, no moving parts measurement solution that provides accurate and extremely reliable bulk level and density measurements.

Externally mounted, Hyperion is not affected by adverse process conditions such as high pressures, extreme temperatures, fouling or corrosive fluids. It also comes with unrivalled stability and automatically compensates for the effects of ambient temperature changes, allowing for sustained accuracy and virtually no age-related drift in its measurements.

Housed in 316L stainless steel as a standard, Hyperion is highly ruggedised, ensuring that vibrations or dust settling have no impact on its operation. Internal sealing also safeguards its condition, even in the event of water ingress. With an enhanced self-diagnostics capability and built-in condition monitoring, Hyperion can monitor health status and relative humidity, predict component failures, and provide an end of life estimation. This allows operators to diagnose why errors in measurement may be occurring, providing a proactive and cost-effective approach to the planning of any maintenance on equipment.

ExxonMobil and IBM sign partnership agreement

EXXONMOBIL HAS SIGNED a partnership agreement with IBM to advance the potential use of quantum computing in developing next-generation energy and manufacturing technologies.

As part of the agreement, ExxonMobil becomes the first energy company to join the IBM Q Network, a worldwide community of Fortune 500 companies, start-ups, academic institutions and national research laboratories working to advance quantum computing and explore practical applications for science and business.

"The scale and complexity of many challenges we face in our business surpass the limits of today's traditional computers," said Vijay Swarup, vice president of research and development for ExxonMobil Research and Engineering Company. "Quantum computing can potentially provide us with capabilities to simulate nature and chemistry that we've never had before. As we continue our own research and development efforts in the areas of energy and chemical manufacturing, our agreement with IBM will allow us to expand our knowledge base and potentially apply new solutions in computing to further advance those efforts."

Advances in quantum computing could provide ExxonMobil with an ability to address computationally challenging problems across a variety of applications, including the potential to optimise a country's power grid, and perform more predictive environmental modelling and highly accurate quantum chemistry calculations to enable discovery of new materials for more efficient carbon capture.

"The advancement of new breakthroughs, coupled with the creative application of current technologies available to us from outside the energy sector, will be critical in addressing the dual challenge of producing energy to fuel economies and meeting consumers' needs while managing the risks of climate change," Swarup said.

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS - EGYPT

Project	City	Facility	Budget ($ US)	Status
EPPC - Propane Dehydrogenation (PDH) and Polypropylene (PP) Complex - Phase 2	Port Said	Polypropylene	1,200,000,000	Engineering & Procurement
ECHEM - Formaldehyde and Derivatives Project	Kafr El Sheikh	Formaldehyde	40,000,000	EPC ITB
ECHEM - Alexandria Propylene Derivatives Project	Alexandria	Propylene	1,000,000,000	Feasibility Study
AMOC - AMOC 2 - Lube Oil	Alexandria	Lube Oil	800,000,000	Feasibility Study
Red Sea Ports Authority - Sonker Bunkering Company - SCA - Bulk Liquids Terminal	Sokhna Port Free Zone	Gas Storage Tanks	504,000,000	Construction
Petro Shorouk - Zohr Gas Field Development	Mediterranean Sea	Gas Field	7,000,000,000	Construction
Petro Shorouk - Zohr Gas Field Development	Damietta	Gas Field	300,000,000	Construction
SUMED - Ain Sukhna Product Hub (ASPH) Project - Tank Farm & Topside Facilities (LOT 2)	Ain Soukhna	Oil Storage Tanks	250,000,000	Construction
ERC - Mostorod Refinery	Mostorod	Refinery	3,700,000,000	Construction
El Nasr For Intermediate Chemicals - Phosphate and Fertilizer Complex	Ain Soukhna	Phosphoric Acid	600,000,000	Construction
ENI - Nooros Exploration Prospect (Abu Madi West)	Nile Delta	Gas Field	12,000,000,000	Construction
Burullus Gas Company - West Nile Delta Gas Field	West Nile Delta	Gas Field	12,000,000,000	Construction
MIDOR - Midor Refinery	Alexandria	Refinery	2,200,000,000	Engineering & Procurement
EEHC - Dairut Power Plant	Luxor	Independent Power Plant (IPP)	2,500,000,000	Engineering & Procurement
ASORC - Hydrocracking Diesel Complex (Overview)	Asyut	Hydrocracker	1,800,000,000	EPC ITB
AQFCIC - Nitric Acid Plant	Ain Soukhna	Ammonia	160,000,000	EPC ITB
Egyptian Chemical Company (KIMA) - Aswan Fertilizer Complex (KIMA 2)	Aswan	Ammonia	592,000,000	Construction
Burullus Gas Company - West Nile Delta Gas Field - Giza,Fayoum, and Raven Gas Fields Offshore	West Nile Delta	Gas Field Development	800,000,000	Construction
ASORC - Hydrocracker	Asyut	Hydrocracker	1,500,000,000	EPC ITB
ASORC - Naphtha Complex	Asyut	Continuous Catalytic Cracker (CCR)	250,000,000	Engineering & Procurement
EHC - Tahrir Petrochemicals Complex	Suez	Petrochemical Complex	7,000,000,000	Engineering & Procurement
AQFCIC - El-Wady Complex for Phosphate and Compound Fertilizers	Abu Tartor	Ammonium Phosphate	750,000,000	EPC ITB
EHC - Tahrir Petrochemicals Complex - Utilities and Offsite Facilities	Suez	Offsites & Utilities	2,000,000,000	Engineering & Procurement
ANRPC - Continuous Catalyst Regeneration (CCR) Unit	Alexandria	Catalysts	294,000,000	Commissioning
Petro Shorouk - Zohr Gas Field Development - Grassroot Natural Gas Processing Plant (Phase 2)	Port Said	Gas Processing	200,000,000	Construction
BP - West Nile Delta Gas Field - Gas Reception and Processing Facility	Various	Gas Processing	1,000,000,000	Construction
Eni - South-West Melehia Block license	South-West Melehia.	Exploration	40,000,000	Engineering & Procurement
Eni - Block 9 (North Leil Offshore)	Mediterranean Sea	Exploration	300,000,000	Engineering & Procurement
Eni - British Petroleum (BP) - Block 8 (Karawan Offshore)	Mediterranean Sea	Exploration	140,000,000	Engineering & Procurement

DMS PROJECTS

Stay one step ahead of your competitors

with the DMS Projects Matrix

A critical and essential **business intelligence** tool, updated daily to ensure you are constantly at the top of your **commercial strategies**, allowing you to **maximise your returns** in today's ever **growing global market.**

REGIONS COVERED

- Asia Pacific
- Middle East
- Latin America
- North America
- Central America
- Russia & CIS
- East Africa
- North Africa
- West Africa
- India
- China
- Europe

SECTORS COVERED

Oil · Gas · Petrochemicals · Water · Power · Infrastructure · Industrial

Refining · Construction · Pipeline · Offshore · Renewables · Mining · Fertilizer

SUBSCRIBE TODAY

or contact us for further information

A Division of DMS GLOBAL

The DNA for Success

- www.dmsprojects.net
- info@dmsglobal.net
- +973 1740 5590 (Bahrain Headquarters)
- +971 249 161 71 (UAE office)

Project Databank

Compiled by Data Media Systems

Project Focus

Compiled by Data Media Systems

Project Summary

Project Name	Red Sea Ports Authority - Sonker Bunkering Company - SCA - Bulk Liquids Terminal
Name of Client	Red Sea Ports Authority, SCA - Suez Canal Authority, Sonker Bunkering Company
Estimated Budget (US$)	504,000,000
Facility Type	Gas Storage Tanks
Status	Construction
Location	Sokhna Port Free Zone
Project Start	Q1-2005
End Date	Q1-2019
PMC	Tebodin
Main Contractor	Petrojet
Contract Value (US$)	3,000,000,000
Award Date	Q1-2016

Project Status

Date	Status
Jan 2019	The project work is in the final stage. The project is expected to be completed by the end of first quarter 2019.
11 Feb 2016	The project work has been started.
4 Feb 2016	The International Finance Corporation (IFC) has approved a US$144mn financial loan package.
10 Dec 2015	The FEED work has been completed.
15 Mar 2015	The agreement between Sonker, DP World, and Red Sea Ports Authority to develop a bulk liquids terminal has been re-signed during the Egyptian Economic Development Conference (EEDC).

Project Scope

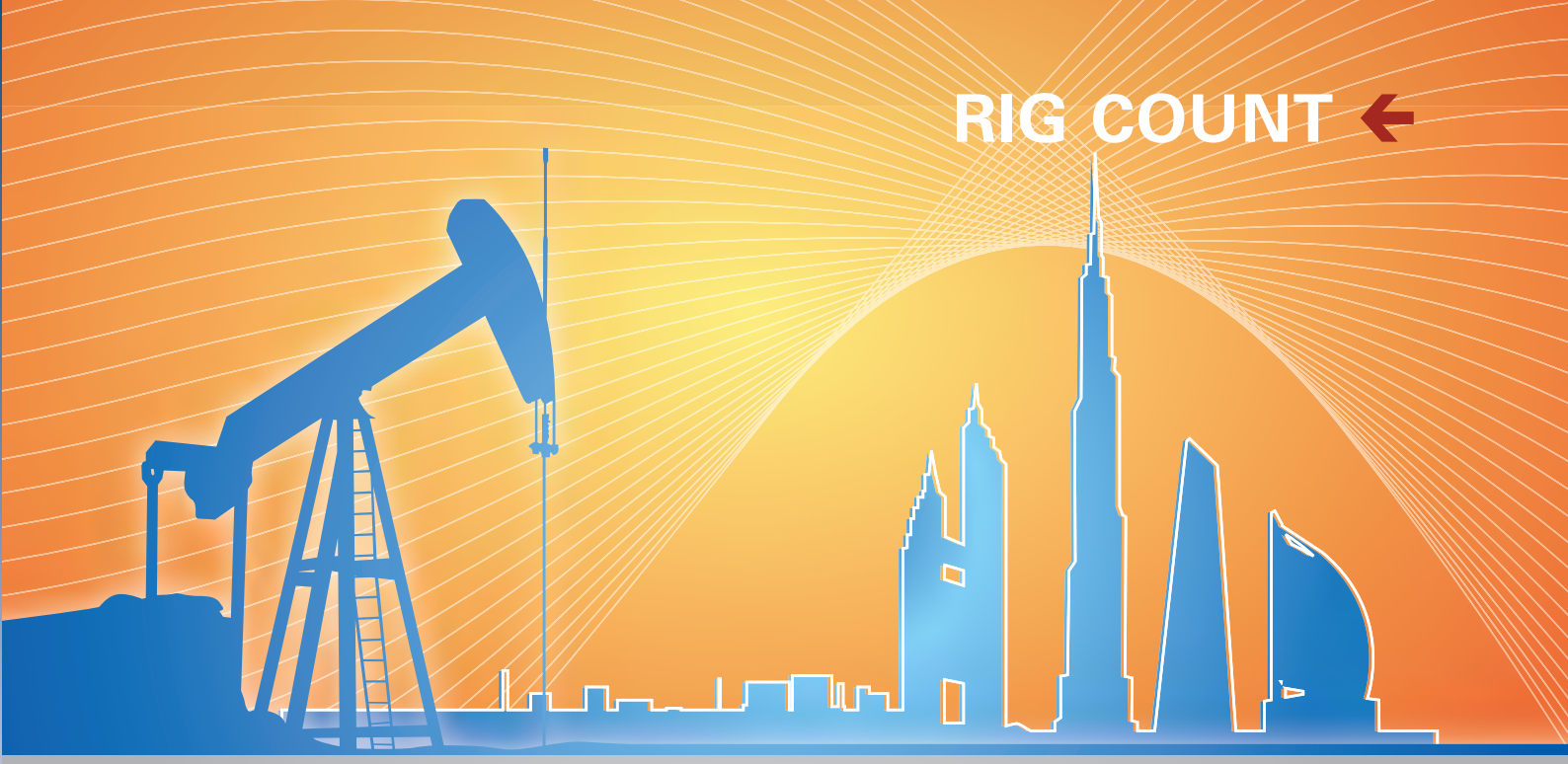
A joint venture between Sonker Bunkering Company, Dubai-based DP World, the Suez Canal Authority, and Red Sea Ports Authority is planning to build a bulk liquids terminal in Sokhna Port for the import and storage of gasoil, butane gas, and LNG to Egypt, in the Suez Canal Development Axis.

The total area of the project is 400,000 sq m and its storage capacity would allow Egypt to import higher quantities of petroleum products.

The platform accommodates two shipments at the same time, with the capacity of 120,000 tonnes individually. Their storage capacity is 150,000sq m of butane gas and 100,000sq m of diesel.

Project Finance

Egypt will own 60 per cent and Sonker-DP World will have the rest of the stakes. Sonker is jointly owned by Amiral Holdings (63 per cent), Misr Petroleum Company (15 per cent), the Egyptian Ministry of Finance (12 per cent) and Cooperative Petroleum Company (10 per cent).



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	36	19	55	0	38	17	55	39	12	51
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	62	0	62	1	61	0	61	54	0	54
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	41	0	41	-3	44	0	44	53	0	53
OMAN	51	0	51	0	51	0	51	55	0	55
PAKISTAN	19	0	19	-4	23	0	23	20	0	20
QATAR	3	6	9	0	4	5	9	3	3	6
SAUDI ARABIA	104	21	125	4	101	20	121	92	19	111
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	316	48	364	-2	322	44	366	316	36	352
North Africa										
ALGERIA	50	0	50	4	46	0	46	50	0	50
EGYPT	21	6	27	1	21	5	26	17	5	22
LIBYA	7	2	9	0	7	2	9	0	1	1
TUNISIA	2	0	2	-1	2	1	3	0	0	0
TOTAL	80	8	88	4	76	8	84	67	6	73

Source: Baker Hughes

بن أرامكو السعودية وشركة سوميتومو كيميكال، ومشروع توسعة بترو رابغ ٢.

المشروع يركز على توسيع وحدة تكسير الإيثان القائمة، وإقامة مجمع عطري، ومصنع لإزالة اختناقات وحدة تكسير الإيثيلين. كما يتيح للمجمع إنتاج ٣٠ مليون قدم مكعب من الإيثان، وثلاثة ملايين طن من النفثا سنويا، والتي تستخدم كمادة أولية لإنتاج مجموعة متنوعة من المنتجات البتروكيماوية.

وتتضمن قائمة المنتجات البتروكيماوية: إيثيلين بروبيلين داين مونومر(EPDM)، لدائن بولي أوليفين الحرارية (TPO)، ميثيل ميثاكريليت(MMA)، مونومر ميثيل ميثاكريلات(PMMA)، بولي اثيلين منخفض الكثافة / إيثيلين فينيل أسيتات(/ LDPE EVA)، كيومين، فينول، بوليمر فائق الامتصاص(SAP)، كابرولاكتام، نايلون -٦ وبوليول. ويتم تصنيع بعض هذه المنتجات لأول مرة في البلاد.

ومحطتنا التالية ستكون شركة «سامرف» (شركة مصفاة أرامكو السعودية شل) ومشروع تجديد وتوسيع معمل تكرير الجبيل. ويهدف المشروع إلى تحقيق المرونة التشغيلية اللازمة لتوليد أقصى عوائد من خلال إنتاج الوقود المستدام، بحيث تستوفي شروط Euro ٧ للحد من المواد المنبعثة، إذ تضع المملكة العربية السعودية نفسها بين قادة المنطقة من حيث استخدام التكنولوجيا النظيفة. وتشمل المنتجات الرئيسية المصنعة في المنشأة كلاً من البنزين والديزل ووقود الطائرات / الكيروسين وزيت الوقود والنفثا وغاز البترول المسال.

وفي أواخر عام ٢٠١٧، منحت شركة سامرف شركة شيكاغو بريدج أند آيرون (ماكديرموت حاليا) عقدا لتوفير الهندسة والمشتريات وإدارة الإنشاءات لتحديث وتوسيع معمل التكرير الخاص بها في مدينة الجبيل بالمملكة العربية السعودية، والذي تبلغ طاقته الإنتاجية ٣٠٥ آلاف برميل يوميا. وتقدر قيمة هذا العقد الأخير بأكثر من ٩٥ مليون دولار أمريكي. ويأتي هذا العقد في أعقاب التعاقد السابق لشركة سامرف مع شركة شيكاغو بريدج أند آيرون للتصميم التصوري وأساليب التصميم الهندسية المستخدمة للتحكم في نفقات المشروع والتخطيط الشامل للمشروع قبل تقديم عرض سعر ثابت، والتصميم المرحلي للمشروع، حسبما ذكر مقدم الخدمة.

ما زلنا في الجبيل، ولكن في هذه المرة مع شركة أرامكو توتال للتكرير والبتروكيماويات (ساتورب) وخططها لمجمع التكرير المتكامل. فقد وقعت مؤخرا شركة أرامكو السعودية وشركة توتال اتفاقية لبناء مجمع الجبيل للبتروكيماويات. وسيلوم عملاقا النفط باستثمار ٩ مليارات دولار أمريكي في المشروع. وسيتم دمج المجمع مع منشأة شركة أرامكو توتال للتكرير والبتروكيماويات (ساتورب) في الجبيل، كمشروع مشترك تمتلك فيه شركة أرامكو نسبة ٦٢.٥ في المائة وشركة توتال نسبة ٣٧.٥ في المائة.

ويضع المجمع بالقرب من معامل تكرير شركة أرامكو توتال للتكرير والبتروكيماويات، وسيشتمل على وحدة تكسير التغذية المدمجة بالبخار بطاقة إنتاجية ١.٥ مليون طن سنويا (مليون طن متري) من الإيثيلين، بالإضافة إلى وحدات أخرى لإنتاج البتروكيماويات. كما أعلنت شركة توتال السعودية أن المشروع سوف يقوم أيضا بإنتاج أكثر من ٢.٧ مليون طن متري من المواد الكيميائية عالية القيمة، وسترد المواد الأولية من معمل تكرير شركة أرامكو توتال للتكرير والبتروكيماويات، ومن صدارة، وهو مشروع مشترك بين أرامكو ودلو كيميكال، وهي تقع أيضا في الجبيل.

وتعتبر هذه المشروعات التي تم الإعلان عنها، بالإضافة إلى مشروعات أخرى، جزءاً من برنامج التحول الاقتصادي في رؤية ٢٠٣٠، والذي يتمثل الهدف الرئيسي منه في إنشاء دور ريادي عالمي في قطاع التنقيب والإنتاج في المملكة العربية السعودية، يقوم على أساس أربعة محركات رئيسية:

١) زيادة قيمة إنتاج المملكة من النفط الخام إلى الحد الأقصى من خلال التكامل عبر سلسلة الهيدروكربون.

٢) السماح بإنشاء صناعات تحويلية لإنتاج السلع شبه النهائية والنهائية للمساعدة في تنويع الاقتصاد.

٣) تطوير التقنيات والابتكارات المتقدمة.

٤) تمكين التنمية المستدامة بما يتماشى مع برنامج التحول الوطني بالمملكة.

وأحد أهم المشروعات هو مجمع تحويل النفط الخام إلى الكيماويات، وهو مشروع مشترك بين أرامكو السعودية والشركة السعودية للصناعات الأساسية. ومن المتوقع أن تصل الطاقة الإنتاجية للمجمع إلى ٤٠٠ ألف برميل يوميا. وتشمل قائمة المنتجات المرتبطة بها حوالي ٩ ملايين طن متري من المواد الكيميائية وزيوت الأساس. ويصل تقدير الاستثمارات في المشروع إلى أكثر من ٢٠ مليار دولار أمريكي، وبالإضافة إلى ذلك، من المتوقع أن تبدأ عملية التشغيل عام ٢٠٢٥.

ووفقا لأحدث المعلومات، من المتوقع أن يوفر المجمع ما يقدر بنحو ٣٠ ألف فرصة عمل مباشرة وغير مباشرة، بالإضافة إلى تحفيز الجهود للتنويع الاقتصادي في المملكة. وبحلول عام ٢٠٣٠، من المتوقع أن يكون لمجمع تحويل النفط الخام إلى الكيماويات تأثير بنسبة ١.٥ في المائةعلى إجمالي الناتج المحلي للمملكة.

وفي عام ٢٠١٨، تم اختيار شركة وود وشركة كيلوج براون روت لتوريد خدمات إدارة المشروعات وأساليب التصميم الهندسية المستخدمة للتحكم في نفقات المشروع والتخطيط الشامل للمشروع قبل تقديم عرض سعر ثابت. وأعلنت شركة أرامكو السعودية وشركة الصناعات الأساسية في السعودية، في نوفمبر/ تشرين الثاني ٢٠١٨، أن مجمع تحويل النفط الخام إلى الكيماويات سيكون في ينبع، على الساحل الغربي لشبه الجزيرة العربية.

وتعتبر المملكة العربية السعودية في الوقت الحالي واحدة من أكبر مراكز تكرير النفط في العالم، كما سيعمل تنفيذ مشروعات التطوير المعلنة على تعزيز مكانتها بشكل أكبر، مع مزيد من التركيز على تسييل الرواسب الهيدروكربونية، وزيادة نسبة التكرير وتعزيز التكامل مع مصانع البتروكيماويات، وهو ما يتماشى مع اتجاهات التنمية في صناعة التكرير العالمية.

مصفاة رابغ (الصورة من أرامكو السعودية)

تطوير المشروعات الرئيسية في السعودية

في هذا المقال، يستعرض ستيفان تشاهان، نائب رئيس شركة يورو بتروليوم للاستشارات (EPC)، بعض مشروعات التكرير والبتروكيماويات الرئيسية في المملكة العربية السعودية. مؤكدا على أن المنافسة في صناعة النفط في ازدياد مستمر، لذا فإن تركيز المنتجين ينصب على التأكد من بقاء الأصول الخاصة بهم داخل مضمار المنافسة، وذلك من خلال المشروعات الجديدة، والتجديدات والتوسعات وتنفيذ برامج التميز التشغيلي.

لا شك أن منطقة الشرق الأوسط تعتبر المنتج الأكبر للنفط والغاز في العالم. لكن على الرغم من ذلك، فعندما يتعلق الأمر بتكرير النفط، نجد أن منطقة الشرق الأوسط لا تزال متأخرة عن بعض المناطق الأخرى حول العالم، ولا سيما مناطق آسيا والمحيط الهادئ وأمريكا الشمالية. ففي الواقع، وعلى الرغم من إمكانات تكرير النفط في المنطقة بشكل رائع في الفترة الأخيرة، فإن معامل التكرير المحلية في الوقت الحالي قادرة فقط على تكرير حوالي ٣٠ في المائة من النفط الخام المنتج هنا. وهذا الوضع يتطور بمعدل خطي، وفق ما أبرزته المملكة العربية السعودية بصفتها أكثر المنتجين أهمية في المنطقة.

المملكة تحتل المكانة الأكبر لتكرير النفط في المنطقة، ولا يدعو هذا الأمر إلى المفاجأة نظرا للوضع الريادي للبلاد في سوق إنتاج النفط وللاستثمارات الجادة التي تمت في غضون السنوات الأخيرة. ووفقا لمعطيات عام ٢٠١٧، تجاوزت الطاقة الإجمالية للتكرير في البلاد ٢.٨ مليون برميل يوميا، وهو ما يمثل حوالي ٣٠ في المائة من الطاقة الإنتاجية بالمنطقة. ويجري تنفيذ عدد من المشروعات في البلاد بهدف زيادة نطاق وعمق التكرير، وتعزيز التكامل بين صناعة التكرير وصناعة البتروكيماويات. وقد تم الاضطلاع بالعديد من المشروعات الهامة. ولنبدأ مسيرتنا مع شركة رابغ للتكرير والبتروكيماويات، وهي شركة مساهمة مشتركة

المحتويات

القسم العربي

تحليلات

ملخص محتويات القسم الإنجليزي:

abc

النشرة النفطية

Oil Review

المحررة: لويز ووتز

فريق التحرير والتصميم: براشانت إيه بي، هيرناي باتيو، ميريام بونتكوما، رانجانات جاي إس، رونيتا بالثال، سامنتا بير، راؤول بوتنفيدو، نكاي مانساماكس، فاني فيتوجوال، روبلينا روي

مدير المجموعة: جورجيا لويس

الناشر: نيك فوردهام

مدير مبيعات: مايكل فيريدج

مدير مبيعات المجلة: تانماي ميشرا

هاتف: +٩١٨٠٦٥٦٨٤٤٨٣ - بريد إلكتروني: [illegible]

Country	Representative	Telephone	Fax	Email
India	[illegible]	[illegible]	[illegible]	[illegible]
Nigeria	Bola Olowo	[illegible]		[illegible]
South Africa	Sally Young	[illegible]		[illegible]
UK	Michael Ferridge	[illegible]	[illegible]	[illegible]
USA	Michael Tomashefsky	[illegible]	[illegible]	[illegible]

مكتب الشرق الأوسط الإقليمي

Alain Charles Middle East FZ-LLC

Office 112, Loft 2B

صندوق بريد ٥٠٢٢٠٧

مدينة دبي للإعلام

دبي - الإمارات العربية المتحدة

هاتف: [illegible]

فاكس: [illegible]

المكتب الرئيسي

Alain Charles Publishing Ltd

University House, 11-13 Lower

Grosvenor Place

London SW1W 0EX UK

هاتف: [illegible]

فاكس: [illegible]

الإنتاج: نيلاي ميندير

بريد إلكتروني: [illegible]

الإشتراكات: بريد إلكتروني: [illegible]

رئيس مجلس الإدارة: دريك فوردهام

المترجم: [illegible] - [illegible]

التصميم والإخراج الفني: محمد مسلم النجار - [illegible]

الطباعة: مطبعة الإمارات - دبي

Alain Charles Publishing

Serving the world of business

© Oil Review Middle East ISSN 1464-9314

ADVERTISERS INDEX

IPWEEK

Hosted By energy institute

International Petroleum Week

Geopolitics | Sustainability | Technology

26 – 28 February 2019, InterContinental Park Lane, London

Speakers include:

Bob Dudley CBE
Group Chief Executive Officer, BP

H.E. Suhail Al Mazrouei
Minister of Energy & Industry, United Arab Emirates

Amin Nasser
President and CEO, Saudi Aramco

H.E. Aziz Rabbah
Minister of Energy, Mines & Sustainable Development, Morocco

Arnaud Breuillac
President, Exploration and Production, Total

Dr Pratima Rangarajan
Chief Executive Officer, OGCI

Andy Brown OBE FREng
Upstream Director, Shell

Capt. Salem Al Hmoudi
Director, Fujairah Oil Industry Zone and Member, FedCom

Dr. Dawood Nassif
Board Director, The Bahrain Petroleum Company

Tor Martin Anfinnsen
Senior Vice President for Marketing and Trading, Equinor

Chad Holliday
Chair, Royal Dutch Shell and Member, Energy Transitions Committee

H.E. Tarek El Molla
Minister of Petroleum & Mineral Resources, Arab Republic of Egypt

Energy Institute Knowledge Partner: IBM

IP Week Knowledge Partner: EY

IP Week Sustainability Partner: ERM

Middle East Partner: Gulf Intelligence

Gold Sponsors: accenture, eka, PETROFAC, Standard Chartered, S&P Global Platts, QUINTIQ

Silver Sponsors: Authentix, CHC, DANA GAS, Haverly, IHRDC, intrexon, ION, PETRONAS, pwc, REFINITIV, RIDER, Schlumberger, seplat, TOTAL

Media Partners: ENERGY WORLD, PETROLEUM REVIEW

For more information, please visit:
Ipweek.co.uk

تُعنى بالنفط والغاز والبتروكيماويات

النشرة النفطية

الشرق الأوسط

العدد الاول 2019

تطوير المشروعات الرئيسية في السعودية

استعراض بعض مشروعات التكرير والبتروكيماويات الرئيسية في المملكة العربية السعودية
بالإضافة إلى أحدث أخبار قطاع النفط والغاز عبر منطقة الشرق الأوسط