

Oil Review

Middle East

Covering Oil, Gas and Hydrocarbon Processing

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Insight and intelligence on
the latest developments and
opportunities

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- Addressing the talent crunch in the downturn
- Protecting critical infrastructure from cyberattack
- Iran petrochemicals - rewards vs risks
- The evolution of pipeline inspection tools
- Offshore Lebanon - mapping prospectivity
- Optimising production with sonar technology

Kuwait's ambitious plans

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2015 KOGS
2nd Kuwait Oil & Gas Show and Conference

HR FORUM
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Mohammed Al Fahoum, Petrofac's country manager for Kuwait, speaks to *Oil Review* about the company's extensive operations in the country

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18
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→ Editor's note

WITH PLANS TO spend US\$100bn over the next five years to raise production capacity to 4mn bpd by 2020, and the need for new technology to exploit its heavy oil resources, Kuwait offers attractive business prospects. While progress has been slow in recent years, the pace of development has been hotting up over the past few months, with KNPC recently awarding contracts for the long-awaited 600,000 bpd refinery at Al Zour, set to be one of the largest of its kind in the Middle East; see our feature on p.34. The Kuwait Oil & Gas Show in October will provide a timely forum to discuss and debate Kuwait's plans, as well the current challenges and issues facing the industry. We hope to see you there!

As always, we bring you news of the latest oil and developments as well as features and analysis on topical issues. Please do get in touch with your feedback and any suggestions for topics you would like to see covered.

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Front cover image: Christian Lagerek / Shutterstock

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Oil Review

Middle East

Covering Oil, Gas and Hydrocarbon Processing

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'Due diligence necessary when doing business in Iraq'

The reality of the operational environment in Iraq was the focus of the Iraq Club meeting held at Dubai Marina on 2 September.

TO DISCUSS THE reality of the operational environment in Iraq, its challenges and opportunities, the Iraq Club, a business-focused network for companies operating in Iraq, was held on 2 September 2015 at Dubai Marina.

Iraq is one of the top three oil-producing nations in the world and oil exports hit a record high in July this year, amounting to 96.3mn barrels. The companies operating in the country say that the IS crisis is not directly affecting the economy of the country. With the world's fifth largest proven oil reserves and an expansive need for infrastructure, why are companies still hesitant about investing in Iraq? And should they be?

This and similar concerns were talked about at the club, which helped bring forth an operationally focused discussion on successfully doing business in Iraq by identifying opportunities, understanding the context and adequately mitigating the risks.

The drop in oil prices has hit the oil and gas sector as well as related sectors hard, and, with a geopolitical crisis looming over the region, Iraq may not be a first-choice destination among investors. Having said that, existing companies are hopeful that with current government initiatives, and investment, the country could move towards development, Sarmad Al-Khudairi, general manager at Dutco McConnell Dowell, asserted.

“The panel session held during the event discussed how companies and stakeholders can mitigate the operational risks and play a greater role in creating a more transparent business environment”

He was among 60 attendees who participated at the interactive and informative session to talk about opportunities in the country.

Depreciating oil prices are also affecting the Iraqi economy and with sanctions on Iran looking set to be removed, it will be a challenging road ahead for the country. Robin Mills, head of consulting at Manaar Energy, noted that the economy of Iraq is governed by oil, and the federal area of the country contains good reserves. However, he added that the failure to adequately develop subsectors like electricity and gas generation to aid downstream operations makes Iraq more vulnerable to lower oil prices than its neighbours.

"Iraq's production has hit record levels this year but unfortunately it comes at a time when the oil prices have fallen by more than half."

He added that Iraq has a lot of opportunities with producing fields



(From left) Zainab Al Qurnawi, managing partner, Qurnawi Legal Consultancy & Advocates; Robin Mills, head of consulting, Manaar Energy; and Norman Ricklets, president, Iraq Advisory Group.

coming on stream at lower costs than the GCC, but the country is in a weak position currently as it is heavily in debt, with no sovereign wealth funds.

Talking about the competition with Iran, Mills noted that Iran is an ally as the two are closely aligned in their oil policies, but also a competitor, with demand growing in the Asian market. "Overall, the picture is mixed."

The panel session held during the event discussed how companies and stakeholders can mitigate the operational risks and play a greater role in creating a more transparent business environment.

In Iraq, it is critical to put in the right research. Undertaking due

“Undertaking due diligence is essential in avoiding possible risks and to ensure sufficient understanding of the legal procedures with respect to the project”

diligence is essential in avoiding possible risks and to ensure sufficient understanding of the legal procedures with respect to the project. These issues can be complex.

“Due diligence plays an important role in conducting business in any market, not least Iraq, and new companies need to be aware from the outset,” said Zainab Al Qurwani, managing partner at QC Law Firm.

It is extremely important for companies to investigate and understand the current legal system before investing. “It is all about educating the companies so that they are prepared,” she added.

Leanne Case, founder of the Iraq Club, noted, “The purpose of this club is to provide a forum for companies operating in Iraq to discuss the challenges and opportunities in a way that helps them to do more business and in a better way. The Iraq Club is more than a networking event, it's an operationally focused forum for doing business in Iraq.”

Norman Ricklefs, president of Iraq Advisory Group, said that with information being private in the country, a lot of emphasis is put on due diligence. “It is good to do your own background checks before initiating new business activities.”

Co-founded by William Wakeham, the Iraq Club was established in 2012 as a network to connect and create better business. “What we have done at the Iraq Club is to put relevant people together to share ideas about Iraq.”

Companies that attended the event included Basrah Gas Company, Dutco McConnell Dowell, Manaar Energy, Veolia, GulfTainer, Wood Group and Khudairi Group, among many others.

The organisers plan to launch further platforms, which would facilitate discussions on the operational challenges and result in real solutions in emerging energy economies. ■

IN THE LATEST developments in the country, according to Reuters, Iraq will use the proceeds of an international bond issue to fund salaries as well as infrastructure projects in the oil and gas, electricity and transportation sectors.

Baghdad wants to raise up to US\$6bn in a series of US dollar bond sales. The first issue is expected to be about a third of that.

The deal was expected to be unsecured.

“The Notes constitute and will constitute direct, general, unconditional and unsubordinated Public External Indebtedness of Iraq for which the full faith and credit of Iraq is pledged,” the prospectus read.

Citigroup, Deutsche Bank and JP Morgan are lead-managing the international issue, Iraq's first in nine years. OPEC's second-largest oil producer is seeking to finance a budget deficit caused by low oil prices and a war against the Islamic State militants occupying large swathes of the north and west.

Economic activity shrank by 6.7 per cent in Q1 compared with the same period last year, the prospectus showed. That figure excludes most economic activity for areas occupied by IS.

Total public debt rose to US\$39.5bn at the end of June from US\$33.3bn at the end of 2014, the prospectus showed. It said foreign exchange reserves had dropped to US\$61.2bn in July from US\$66.3bn at the end of last year.

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→ Executives' Calendar 2015

OCTOBER 2015

6-7	Oil & Money	LONDON	www.oilandmoney.com
11-13	Data Driven Visualisation Technology Workshop	ABU DHABI	www.ppdm-course.com
11-14	Kuwait Oil & Gas Show	KUWAIT	www.kogs2015.com
14-15	European Digital Oilfield Summit	LONDON	www.asdevents.com
18-20	Plastics & Petrochem Arabia	DAMMAM	www.plaschem.4p-arabia.com
19-22	Project Iraq	ERBIL	www.project-iraq.com
19-21	Negotiation in Oil & Gas	DOHA	www.cwcschool.com
25-27	Second HR Forum: Oil & Gas	DUBAI	www.hrforumoilandgas.com
27-30	Gastech	SINGAPORE	www.gastechsingapore.com

NOVEMBER 2015

9-12	ADIPEC	ABU DHABI	www.adipec.com
16-18	World Oil & Gas Week	LONDON	www.oilandgascouncil.com
18-19	PEFTEC	ANTWERP	www.pefttec.com
23-25	Saudi Arabia International Oil and Gas Exhibition	DAMMAM	www.saoge.org
24-26	Intergas	CAIRO	www.intergas-egypt.com
25-26	Middle East Heavy Oil Congress	MANAMA	www.meheavyoil.com
30 Nov - 2 Dec	KIOG	LONDON	www.cwckiog.com

DECEMBER 2015

6-8	OpEx MENA	ABU DHABI	www.opex.biz
6-9	International Petroleum Technology Conference	DOHA	www.iptcnet.org/2015/qatar
9-10	Bottom of the Barrel Technology Conference	ABU DHABI	www.bbtc-mena.biz

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

HR Forum Oil & Gas - Addressing the talent crunch in a downturn

THE GREAT CREW change, coupled with the current downturn, the oil and gas industry faces particular challenges when it comes to recruiting, training, developing and retaining their workforce and leaders. While the Middle East has suffered less than other regions in terms of workforce cutbacks, the Monster Employment Middle East Index for July 2015, which monitors online job activity, records a drop of 7 per cent in oil and gas hiring activity compared with the same period of 2014, with some experts predicting a hiring freeze. This, compounded with existing skills shortages, has critical implications for the future of the region's oil and gas development.

Against this backdrop, Oil Review Middle East brings you the 2nd edition of the HR Forum Oil & Gas to provide a forum for discussion and debate, with the timely theme of 'Addressing the talent crunch in a downturn'. Following the highly successful inaugural event in October 2014, the event, which takes place from 25 – 27 October

2015 at the Habtoor Grand Beach Resort & Spa, Dubai, will enable participants to discover the latest recruitment and retention strategies, training and up-skilling solutions, talent and knowledge management approaches, and leadership development programmes. It will focus on

- Workforce planning and attracting the right staff during a downturn
- Competency mapping as a basis of training and development
- Developing e-learning strategies
- Re-imaging performance staff development in a downturn
- Motivating and incentivising employees
- Retaining and promoting women in the energy sector.

The event will field an international line-up of expert speakers from companies such as Abu Dhabi Oil Refining Company (TAKREER), The Petroleum Institute, Kuwait Oil Company, Dolphin



The event will focus on strategies to address the talent crunch in a downturn

Energy, TOTAL E&P, Baker Hughes, Oando Energy Resources and Hay Group. It will also feature practitioner-led training workshops.

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



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Middle East Heavy Oil Congress to provide platform for industry debate

OFFICIALS, EXPERTS AND key stakeholders from the Gulf and other heavy oil producing countries will gather in Manama, Bahrain, on November 25-26 for the Middle East Heavy Oil Congress (MEHOC), a forum that will provide a platform for discussion and debate of the latest business issues and technologies of the heavy oil industry.

The congress and exhibition at The Gulf Hotel will be held under the patronage of His Excellency Dr Abdul Hussain bin Ali Mirza, Bahrain's Minister of Energy and Chairman of the National Oil and Gas Authority (NOGA).

"As the energy sector is increasingly turning to the exploitation and conversion of their conventional heavy oil resources, the Middle East Heavy Oil Congress provides the perfect regional gathering for the industry to discuss what innovative trends and transformations will define the future of this upcoming sector," said Dr Ahmed Al Sharyan, general secretary of the National Oil & Gas Authority (NOGA).

Organisers, DMG Global Energy said the event provides "the perfect platform" for global and regional experts involved in both the upstream and downstream heavy oil sector to share knowledge, review new technologies and discuss business opportunities and challenges with the leading companies involved in this fast-evolving sector.

MEHOC will include topics such as evaluating a holistic approach to extending the reservoir lifecycle, emerging technologies to maximise

performance with minimum environmental impact, and technical heavy oil case studies from across the globe.

Companies which have already confirmed their participation include NOGA, Bapco, Tatweer Petroleum, Saudi Aramco, Kuwait Oil Company (KOC), GlassPoint Solar, Petrospec Engineering, Promore, Innovative Steam Technologies, Nalco Champion, SATORP, PetroChina, Kuwait Institute of Scientific Research, and Streamflo.

In an interview with MEHOC ahead of the congress, Emad Sultan, deputy CEO, KOC said the KOC 2030 strategy has envisioned the development of heavy oil resources in two phases. Phase 1 aims to establish heavy oil production to build strategic capability to produce 60 MBOPD of heavy oil starting from 2018/19. Phase II aims to grow heavy oil

production to higher rates to contribute in achieving Kuwait's target capacity of 4 MMstbo by 2020, and further increase heavy oil production by 2025.

Chandra Sekhar, process specialist at Bapco, will speak about Bahrain's refinery Fluid Catalytic Cracking Unit (FCCU), which was revamped to process heavy oil, with modest investment, and how the project has been extremely successful, with a great return on investment.

For further information, see the website at www.meheavyoil.com.



The Middle East Heavy Oil Congress will take place in The Gulf Hotel, Manama (Photo: Eugene Sergeev)

International Petroleum Technology Conference to return to Qatar

NOW IN ITS ninth edition, the International Petroleum Technology Conference (IPTC) is set to take place in Doha, Qatar, from 6-9 December 2015, with Qatar Petroleum as host and Shell as co-host. Themed "Technology and Partnerships for a Sustainable Energy Future," the event will be held under the patronage of HH Sheikh Tamim Bin Hamad Al-Thani, the Emir of Qatar.

Organised by the American Association of Petroleum Geologists (AAPG), the European Association of Geoscientists and Engineers (EAGE), the Society of Exploration Geophysicists (SEG), and the Society of Petroleum Engineers (SPE), IPTC is expected to attract more than 5,000 attendees from 120 countries, with more than 80 companies expected to showcase their latest products, technologies, and services at the 5,000 sq m exhibition space.

Expanding on the conference theme, the two plenary sessions will see chairpersons, presidents and senior executives from Qatar Petroleum, KPC, ConocoPhillips, Royal Dutch Shell, Total, Saudi Aramco, ADMA-OPCO, GE Oil & Gas MENAT, Maersk Oil & Gas, Medco Energi International, and CGG, discuss the need for partnerships involving business, government



and civil society. They will explore collaborative strategies for making current energy sources cleaner and more efficient, and producing and distributing energy in innovative ways.

Industry experts will discuss topical issues through five interactive panel sessions entitled 'Supply and Demand: Current Trends, Future Projections for Sustainable Energy Future'; 'Unlocking Energy Resources through Technology'; 'Who Will Run the Energy Industry in the Future?'; 'Investing in Energy and Optimising Costs for the Long Term'; and 'The Role of the Oil and Gas Industry: The Climate Change Puzzle'.

There will be more than 300 technical presentations during the 62 technical sessions scheduled over three days. The technical sessions fall under nine categories: Geoscience; Drilling and Completions; Reservoir; Production and Operations; Engineering, Projects and Facilities; Field Development; Over-Arching Industry Issues; Mid-Stream Gas; and Integrated Geoscience and Reservoir. Knowledge sharing e-poster sessions will also take place.

New additions to the technical programme will include sessions entitled 'Ask the Expert', 'Society Presidents' Sessions', 'IPTC Project Awards Finalist Sessions' and the 'Project Case Study Session'. In another first, the top 10 rated papers from the IPTC sponsoring societies will be presented at the event.

Other activities include the International University Students Programme, International Young Professionals Programme, Energy4me Teacher and Students Workshops, High School Projects Competition, Non-Technical Seminars, Training Courses, and the IPTC 'Excellence in Project Integration' Awards.

For more information, visit www.iptcnet.org/2015/doha.

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شركة بترول أبوظبي الوطنية (أدنوك)
Abu Dhabi National Oil Company (ADNOC)

Saipem wins Kuwait onshore drilling contracts

ITALIAN EPC AND drilling firm Saipem has won two new onshore drilling contracts in Kuwait. The contracts were awarded by Kuwait Oil Company, the national oil company of Kuwait, as part of its ambitious plans to develop the country's oil resources. The awards represent the company's first foray into the Kuwaiti onshore drilling market.

The contracts have a duration of five years and an option to extend for another 12 months, and include the supply of two 3,000HP deep-drilling rigs for operations in the country.

Entering the onshore market in Kuwait will enable the company "to further consolidate its presence in the strategic Middle Eastern market and leverage its significant experience of onshore drilling operations in desert environments," said Saipem in a statement.

Along with another two contracts that Saipem won in Peru and Colombia in South America, the total value of these contracts is approximately US\$250mn.



This would be Saipem's first onshore foray in Kuwait (Photo: ShavPS/Wikimedia Commons)

Iraq aiming for record Basra exports in October

IRAQ IS HOPING to export a record volume of Basra crude oil from its southern terminals in October as it ramps up production.

The country, which is the largest OPEC producer after Saudi Arabia, plans to export 3.68mn bpd of Basra crude, according to traders who cited a preliminary loading programme. If realised, the volume would overtake the previous monthly record of 3.064mn bpd set in July this year.

Iraq has split its Basra crude output into two grades, Basra Heavy and Basra Light. That has led to many quality issues being resolved and has also allowed the country to ramp up its output.

However, some industry insiders feel that the country may not be able to achieve those volumes. According to a source, Iraq tends to allocate more volumes than it can supply each month to avoid disrupting production, since the country has limited storage capacity to keep excess oil. According to him, Iraq may not export more than 2.35mn bpd of Basra Light and 850,000 bpd of Basra Heavy in October.

Development of Egypt's Lagia field enters second phase



At least five more wells will be dug at the field (Photo: huyangshu/Shutterstock)

MENA INTERNATIONAL PETROLEUM Company, a subsidiary of SacOil Holdings (SacOil), has started the second phase of the field development operations at its 100 per cent owned Lagia oil field in Sinai, onshore Egypt.

The second phase aims to enhance existing production and the recovery of oil from the field. Accordingly, it includes the installation of steam facilities for a thermal recovery process on the existing production wells and the drilling of a minimum of five additional thermal wells.

SacOil had procured a steam generator earlier this year which arrived on site in the beginning of September 2015, and after commissioning and operational testing, full-scale steaming was expected to start by the end of the month. The steaming will initially focus on the existing production wells, which are currently producing oil from cold flow only.

The commencement of this phase also coincides with the drilling of at least five more wells. The drilling of wells Lagia 11 to 15 is expected to start in mid-October 2015. Aligning the steaming process with the additional drilling programme will optimise the use of on-site resources and test the potential upside of the entire field.

SacOil plans to fast-track the development of the Lagia oil field to generate production of more than 1,000 bpd.

Saudi Arabia and Bahrain sign US\$300mn pipeline contracts

THE TWO COUNTRIES have signed contracts worth about US\$300mn to lay a new oil pipeline that will carry 350,000 bpd of oil between the two countries. According to Abdul-Hussain bin Ali Mirza, Bahrain's energy minister, it will be operational in 2018 and its capacity could be increased to 400,000 bpd.

"It will be finished by the end of 2017 or early 2018 and then there will be a six-month trial period for the new pipeline," said Mirza. He added that the existing pipeline would probably be removed from service in the second half of 2018.

At present, Bahrain obtains a significant majority of its oil from the Abu Safa oil field that it shares with Saudi Arabia. The existing pipeline, with a capacity of 230,000 bpd, limits the Bahrain Petroleum Company (Bapco) from expanding its processing capacity at the 267,000 bpd Sitra refinery.



The existing pipeline is ageing and will be removed from service (Photo: Sergey_R/Shutterstock)

The increased capacity of the new 115 km pipeline is likely to translate into increased processing of crude oil in Bahrain. Arabian Light crude oil will flow from Saudi Aramco's Abqaiq plant via the pipeline, 73 km of which will run overland and the rest under the Gulf.

Agreements to build the pipeline were signed with Saudi Arabia's Al Robaya Holding Company and UAE's National Petroleum Construction Company (NPCC). The Saudi company will complete onshore engineering, procurement and construction (EPC) work in Saudi Arabia, as well as conducting engineering and procurement work in Bahrain. NPCC has been awarded an EPC contract for the offshore work.

According to a Bapco statement, the contract for construction at the Bahrain end of the pipeline has yet to be awarded.

The cost of the pipeline will be met by nogaholding, an investment vehicle which holds the Bahraini government's oil and gas assets.



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OPEC forecasts higher demand for its oil in the medium term

NEW MEDIUM-TERM FORECASTS from OPEC say that demand for its oil is set to go higher. OPEC delegates said that it is a sign that the group's strategy of letting prices fall is discouraging supplies from competing producers.

The forecasts will be published in OPEC's *World Oil Outlook* that will come out later this year, and were discussed recently at a meeting of OPEC's national representatives at its Vienna headquarters. The exact figures for the 2015 report could still be revised, based on feedback from the national representatives, who are technical experts and do not set OPEC's output policy.

OPEC's new outlook is being prepared after the group's historic policy shift in November 2014 to not support prices by cutting output. It was done to defend market share against US shale oil and other higher-cost supply sources.

The policy has not been approved of unanimously within OPEC. As oil prices have fallen to less than half from more than US\$100 in June 2014, it has hurt the economies of less wealthy member countries, such as Venezuela. The South American country has been calling for cuts in output to prop up prices.

The new forecasts of higher demand seem to support the view of the Gulf members



Some OPEC members have been calling for a cut in output to push up oil prices (Photo: Vincent Eisfeld/Wikimedia Commons)

that sustained lower prices would curb competing supplies.

Two upstream contracts for Tendeka

PROVIDER OF UPSTREAM oil and gas completions systems and services, Tendeka, has won two contracts for its zonal isolation and inflow control technology in the Middle East.

After a successful initial contract, the company has been re-awarded the contract to supply Petroleum Development Oman (PDO), with swellable solutions for all fields in Oman. The US\$5mn contract will span five years, with an optional two-year extension. Since 2002, Tendeka has deployed over 4,000 of its SwellFix packers for PDO.

In another award, also following work on previous contracts



SwellFix sleeves are a flexible barrier solution for zonal isolation (Photo: Tendeka)

including fibre optic monitoring and both swellable and mechanical zonal isolation solutions, Tendeka will provide a major operator with inflow control device (ICD) completions and swellable packers in a deal valued at about US\$5mn. The four-year contract will be the first ICD installations for the major operator and will commence with installation of three trial wells.

Sparrows Group wins ADMA-OPCO contract

SPARROWS GROUP, AN offshore lifting products and services firm, has won a three-year deal with Abu Dhabi Marine Operating Company (ADMA-OPCO), with the option for two one-year extensions.

The agreement covers ADMA-OPCO's offshore installations, the Umm Shaif Super Complex, Zakum West Super Complex and the Zakum Central Super Complex.

Stewart Mitchell, CEO of Sparrows Group, said, "The work we have been contracted to do involves providing the total integrated management of cranes and other lifting equipment which optimises the performance and reliability of all safety critical lifting operations."

Mitchell said that along with "providing offshore personnel who are supported by our onshore staff in Abu Dhabi and worldwide, we will be supplying preventative maintenance, repair and refurbishment, spare parts, and comprehensive technical support."

The successful retender has been won through the company's local partner, Abu Dhabi Oilfield Services.

"We have focused on growing our presence in the Middle East and an important part of this involves building upon our existing contracts. Our strong reputation for quality and a client focussed delivery is proving to be particularly appealing to operators in the region," Mitchell added.

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Petrofac wins Bahrain contract

PETROFAC'S OFFSHORE PROJECTS & Operations has secured a contract with Tatweer Petroleum to supply a gas dehydration facility in Bahrain, making it the company's first project in the country.

A new 500mn standard cubic feet gas dehydration facility will be installed and will be the first of a series of planned gas capacity projects scheduled for the next three to five years, said Petrofac. The project is part of Tatweer Petroleum's commitment to secure the delivery of natural gas needed to meet the growing demands of Bahrain.

"This award builds on our growing portfolio track record in the Middle East, where we've demonstrated our ability to safely deliver project performance and integrity. We now look forward to working closely with Tatweer Petroleum and to playing a key role in the successful future supply of energy from the Bahrain oil field," said Manivannan Rajapathy, deputy managing director of Petrofac Offshore Projects and Operations.

Tatweer Petroleum CEO Andrew Kershaw said that the installation of the facility would be a milestone in Bahrain's future energy strategy.



The project will be Petrofac's first in Bahrain

Eni to start Egypt digging operations in early 2016

ENI PLANS TO start digging early next year in the 'super giant' gas field it recently discovered offshore Egypt. Digging operations in the natural gas field off the country's Mediterranean coast will start in January 2016, said Lapo Pistelli, vice president of the Italian company. Eni wants to start work in the field to be able to benefit from the big discovery as soon as possible, Pistelli added, noting that this would also have a positive impact on the Egyptian economy. The gas field could potentially hold 30 tcf of natural gas, making it the largest gas discovery ever made in Egypt and in the Mediterranean Sea, and one of the biggest finds in the world. According to Pistelli, the new discovery offshore Egypt could be just the beginning of bigger findings in even deeper waters of the same field.

Global gas demand continues to slow

THE GLOBAL DOWNWARD trend in gas demand growth continues, according to the latest statistics of the international gas association CEDIGAZ, which show that marketed natural gas production increased by only 1.3 per cent to 3,445 bcm in 2014, on a par with 2013 levels (+ 1.2 per cent). This was mainly as a result of increased competition from coal in both Europe and Asia, the economic slowdown in China and the exceptional warm weather conditions in the northern hemisphere.

World gross natural gas production grew more significantly by 1.7 per cent to 4,319 bcm, as strong increases were recorded in the volumes of reinjected gas (+ 4.6 per cent), flared and vented gas (+ 2.9 per cent) and other losses related to processing and field operations (+ 2.2 per cent).

In the context of falling demand in Europe and the CIS, international gas trade declined markedly by approximately three per cent to 1,007 bcm, pulled down by pipeline flows (– 4.3 per cent), especially in Europe, the main area for the gas pipeline trade.

After several years of market tightening, LNG supply grew by 0.8 per cent to 312.8 bcm, due to few liquefaction outages, and new liquefaction plant start-ups in Papua New Guinea and Algeria.



International gas trade declined markedly in 2014 (Photo: Bilfinger SE)

The Asian natural gas market was characterised by a sharp slowdown in the growth of gas demand at 2.7 per cent, contrasting with the previous five-year average of 6.5 per cent per year.

These developments have led to the emergence of a global LNG glut and the collapse in spot prices in both Europe and Asia.

Global reserves remained almost stable (+0.3 per cent) at around 200 tcm. The highest increases were recorded in Russia and the United States, while European reserves dropped by almost seven per cent.

Emerson provides automation solutions for Qatargas project

EMERSON PROCESS MANAGEMENT has provided automation and engineering services for a Qatargas project that will reduce greenhouse gas emissions by 1.6 million tonnes annually.

Now fully operational, the Jetty Boil-Off Gas (JBOG) Recovery facility is the biggest of its kind and one of the largest environmental investments in the world. It is expected to recover more than 600,000 tonnes of LNG per year – equivalent to the energy supply for more than 300,000 homes.

The facility is designed to recover the gas flared during LNG loading at the six LNG berths in Ras Laffan Port. The gas is compressed and sent to the Qatargas and RasGas LNG production facilities for use as fuel or LNG.

Emerson won the multi-million dollar contract based on its leadership in oil and gas automation technologies, services, and expertise. Emerson specialists managed key elements of the project including automation engineering, configuration, startup, training, commissioning support and other services.

Emerson's automation solutions for the project included the DeltaV™ distributed control system to control and monitor operations, as well as the company's Fisher® control valves and Rosemount® measurement instruments.

LNG vessels at Ras Laffan



"The Emerson team welcomed this opportunity to help Qatargas execute the project safely, reliably and efficiently," said Alvinne Rex Abaricia, Emerson's senior program manager for Qatargas. "We were able to apply flexible approaches to increase efficiency, such as testing hardware and software in parallel, and brought in dozens of experts from our own organisation as well as other suppliers to manage interfaces between existing and new systems."

Speaking at the official inauguration of the JBOG Recovery facility in April, Saad Sherida Al-Kaabi, President and CEO of Qatar Petroleum and Chairman of Qatargas, commented that the US\$1bn project is a landmark for the Qatari state, demonstrating its commitment to balance industrial expansion with care for the environment. Various other projects are underway in Qatar to reduce carbon emissions, which include carbon capture initiatives and other flare minimisation programmes.



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Currently, SOCAR-AQS implements works on drilling the wells from fixed platform 11 located on Shallow Water Gunashli Field, and from fixed platform 1 located on Umid Field. At the same time, the company is continuing preparatory works on drilling the wells on the West Absheron, Bulla and Gunashli 7 platforms.

SOCAR-AQS has an Integrated Management System that meets the requirements of ISO 9001:2008 Quality Management System, ISO 14001:2004 Environmental Management System and OHSAS 18001:2007 Occupational Health and Safety Management System. The company's implemented Integrated Management System was successfully certificated based on the requirements of the above standards.

At present, SOCAR-AQS is carrying out the works on implementation and subsequent certification of its system based on the requirements of API Spec Q2. In 2015, SOCAR-AQS was certified by Azermis for completing the Enterprise Development and Training Programme in Oil Well Services.



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Achieving success with integrated projects

Andy Gibbins, VP MENA at Euro Petroleum Consultants, outlines the challenges and benefits of refinery and petrochemicals integration.

WE HEAR MUCH about projects involving refinery and petrochemicals integration nowadays. In the low crude oil price environment, operational efficiency is critical, and integration is an excellent way of optimising overall margins.

This region has seen some huge integrated projects such as SATORP, PetroRabigh and SADARA. Those projects that have been completed and commissioned have been largely successful, but organisations that have undertaken such projects will surely admit that there is a steep learning curve, and lessons learned must be applied to future integrated projects.

The concept of integration is nothing new. ExxonMobil, for example, has a level of integration of over 90 per cent. The fact that the company has consistently outperformed its peers in terms of return on capital employed is very much related to the optimised approach the company has taken over the years. Total, too, has worked hard to integrate its assets.

However, despite many years of success, ExxonMobil has always stated that integration is never complete, and that success requires a long-term and disciplined approach, supported by a steadfast commitment to leading-edge technology. This means a focus on technologies to reduce energy use, emissions, reduce costs and to deliver the quality products that customers (and regulators) demand.

Five-point model

ExxonMobil has a five-point model that it has rigorously applied to all of its integrated projects. The aim is to optimise feedstocks, products, costs, capital and, very importantly, people. The last point is particularly important, as an integrated site can undoubtedly deliver significant competitive advantage, but that brings with it a level of complexity that must be understood and managed by the people working there.



Andy Gibbins, VP MENA, Euro Petroleum Consultants

It is most important to have people who understand both the refining and the petrochemicals sides of the business and appreciate the need to optimise across the hydrocarbon chain, not just in a specific product area. To achieve this, the corporate focus should be on overall business success, and any reward schemes should be based on this, rather than individual unit performance. Then when building leadership teams and carrying out career planning, it is important to ensure that key staff have extensive experience in both refining and petrochemicals.

For new projects, the organisational culture should be developed based on

integration; lessons should be learned from those who have integrated successfully.

From a project point of view and, in an ideal world, integration opportunities should be built into a project from its inception. Reality and financial constraints limit what can be done when the project is first designed; however many integration opportunities can be 'retrofitted' and can be developed between partner organisations, provided that the up-front planning has been done in the initial design stages and suitable connections and isolations built into the design. This means that the operator-EPC contractor-technology licensor link is particularly important and must be managed effectively.

To be successful, it is imperative the producer companies are highly motivated, fully committed and have the right organisation in place to manage integration. There must be board level support and involvement in the integration process and in the case of multiple parties, there must be commitment and understanding, in order to create a 'win-win' solution.

For new projects, detailed integration planning should be introduced at the very start of the process. Independent experts should be engaged – on behalf of the owners – to identify the various integration opportunities that exist for the given scenario. Designing for feedstock flexibility will cost more initially, but will multiply potential benefits and, critically, return on investment.

Successful integration requires joined up thinking, knowledge and experience. Everyone involved in such projects should seek out every opportunity to learn from others and to continually optimise their approach. ■

“The concept of integration is nothing new”

Euro Petroleum Consultants (EPC) is an independent consulting group formed in London in 1996. For further information, please visit www.europetro.com or contact the Dubai office at office@europetro-me.com.

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Risk and reward in Iran's petrochemicals

Iran offers low-cost feedstocks and access to major markets, but needs infrastructure and technology investments while facing significant business and political risks.



Iran is a major producer of chemical feedstock (Photo: MMMx/Shutterstock)

A REKINDLING OF DIRECT foreign investment in Iran's huge petrochemical sector – if and when sanctions are lifted – could reap large rewards for nimble investors ready to stomach relatively high levels of economic

and political risks, said IHS, a leading provider of global information and analysis.

According to IHS, Iran's risks include a high degree of political risk, legal uncertainty, administrative and bureaucratic obstacles. Despite these risks, Iran has a

number of important advantages to potential petrochemical investors, including low-cost feedstocks and access to major markets. Iran has the world's fourth-largest supply of proven oil reserves and the second-largest supply of conventional natural gas reserves – much of which is rich in ethane, a petrochemical feedstock. This is significant given that chemical feedstock availability in other countries such as Saudi Arabia, Kuwait and Oman has become more limited. "If you are a global petrochemical producer looking at Iran for its investment and growth opportunity, and you can forget for a minute

“Within two years of lifting sanctions, Iran will rapidly start taking advantage of easier access to foreign capital markets, trade financing, oil markets and technology providers”



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about the major business and political risks involved, it presents an attractive opportunity," said Michael Smith, vice-president of EMEA at IHS Chemical. "Major chemical players are chomping at the bit to explore the potential that Iran offers, but they will not be doing so haphazardly. These companies are used to operating in risky environments and managing significant risk — it's the nature of the business, but the reward has to significantly outweigh the risk, which is something they will be assessing very carefully and deliberately."

IHS estimates that Iran's current petrochemical production capacity is just below 60mn metric tonnes (MMT). The country produces a wide range of petrochemicals, roughly 100 different products, ranging from acetic acid to mixed xylenes. While the vast majority of these products are produced to serve Iran's own economy and a population of nearly 80mn, a few products are aimed at export markets. These are primarily ethylene, polyethylene (PE), methanol, and mono-ethylene glycol (MEG).

The petrochemical industry, while quite diverse, is primarily focused on exploiting the country's vast resources of ethane-rich natural gas. On the one hand, Iran converts methane from natural gas to methanol and urea. But, it also cracks ethane and other natural gas liquids to produce ethylene, which is then polymerised to PE or processed to MEG.

Aside from the lure of oil reserves and abundant ethane feedstocks, the price of ethane gas in Iran is kept low by government mandate. In general, ethylene production costs in Iran, based on ethane, are comparable to those in Saudi Arabia or North America, i.e., the lowest in the world. Both ethylene and polyethylene are key products for Iranian export, and lifting of sanctions would enable Iran to expand production and export an additional 1 MMT of ethylene/polyethylene within 12 months to

two years, according to IHS Chemical estimates.

Smith added, "Trading companies will be eager to access these volumes of Iranian ethylene and PE, but the impact on global operating rates, according to our IHS Chemical analysis, is not expected to be dramatic — less than one per cent lower than currently projected. Nevertheless, additional Iranian ethylene in the form of polyethylene could hit the market just when global operating rates are at a low point in the years 2017-18, which would exert some downward pressure on prices."

Another key export commodity for Iran is methanol. Iran is a major methanol producer and exporter, with five MMT of capacity, and methanol producers in Iran also enjoy very advantageous production costs. Lifting sanctions would accelerate Iran's methanol production plans and drive progress on many proposed projects. While Iran has proposed projects totaling more than 20 MMT of new methanol capacity, IHS Chemical believes a more realistic figure of approximately 10 MMT could be added by 2025.

Impact of sanctions

In the early 2000s, Iran embarked on an ambitious petrochemical expansion plan based on the country's huge abundance of natural gas. The original plan was to expand petrochemical production capacity from nine MMT in 2001 to 100 MMT annually by 2015. However, as a result of tightening restrictions on the flow of capital and goods, as well as limited access to necessary technology, parts and materials, Iran missed this goal by a long shot, IHS said.

Before the sanctions were implemented, Iran was a major supplier of petrochemicals to Europe — primarily ethylene, PE and methanol. However, total petrochemical export volumes from Iran did not suffer significantly as a direct result of the sanctions. Under the sanctions, these products were simply redirected to Asian,

African and some South American countries, principally China and India. Business with Europe, however, virtually disappeared.

The much larger impact resulted from the inability of Iran to maintain and invest sufficiently in its oil/gas and petrochemical feedstock and export infrastructure, which has led to chronically low capacity utilisation rates, not the least due to periodic shortages in ethane feedstock. Development of the Iranian energy sector has been impeded by international sanctions that have stifled the influx of essential foreign investment and technology. Progress in the country's steam-cracker investments has been slow since the start-up of the Kavyan 1 unit in late 2012, and feedstock is in short supply, IHS said. Progress on the Kavyan 2 unit has been delayed by the sanctions limiting gas shipping. Sanctions have also restricted developments of the gas processing necessary to extract ethane for feedstock. Even the existing crackers at Bandar Assaluyeh are short of feedstock, so adding further steam-cracker capacity will be of little use until natural gas and feedstock availability increases.

"Lifting of sanctions on the industry and on Iranian finances will rekindle foreign investment and allow Iran's petrochemical industry to get back on a fast track to growth," Smith said. "In the short term of one to two years after sanctions are lifted, Iran will rapidly start taking advantage of easier access to foreign capital markets, trade financing, oil markets and technology providers."

The re-integration of Iran into the global business community, Smith said, will revitalise the country's petrochemical business in a major way. "Iran will take steps toward resuming its important role in supplying global markets with much-needed petrochemical products. As a consequence, the Iranians are likely to benefit from increased industrial development and higher standards of living." ■



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MENA oil producers – time to re-evaluate strategies

Samuel Ciszuk looks at the battle for market share among MENA oil and gas producers in an environment of low oil prices and oversupply.



*Shale output is forecast to decline by 400,000 bpd as a response to low prices.
(Photo: Nicholas A Tonelli)*

OPEC MAY BE approaching a fork in the road, as the Saudi-led effort to protect market share and make high-cost producers bear the consequences of oversupply starts yielding results. Low prices have stymied non-OPEC investment, while also stimulating demand. However, with Iraq still hoping for further output growth, and Iran signalling its intent to regain its pre-sanctions market share, OPEC members might start competing among themselves by late-2016 if official targets are to be believed.

The fall in oil prices, which began in mid-2014, reached a new low in the past month, with the Brent benchmark testing the low US\$40s per barrel. The market's uncertainty about the direction of oil prices is understandable. Although there has also been considerable uncertainty over the past year, focus has largely been on familiar areas of concern, namely ongoing oversupply

versus expectations of the extent demand would respond to low prices.

Strong response

Demand has responded strongly, although parts of the market might still have overestimated the response, resulting in the now premature-looking oil price recovery in the spring. By this summer, however, oversupply continued and expected declines, particularly in North American unconventional output, disappointed, while Chinese stock market jitters reignited fears

over China's economic growth and hence demand for hydrocarbons.

With the Brent price in the mid-US\$40s per barrel, there are increasing signs of a negative turnaround in US shale oil production. In its September Oil Market Report, the International Energy Agency (IEA) revised its estimate of US oil production to have already been in decline since about April, although the end-year balance could still show growth. Furthermore, shale output is estimated to decline by 400,000 bpd in 2016 as a response to low prices.

Other areas of production could, of course, also show a high decline rate in response to lower prices, particularly given the capital expenditure cuts being announced throughout the industry. The UK portion of the North Sea reacted very quickly to capital expenditure cuts when the UK government raised taxes in the wake of the

“Other areas of production could also show a high decline rate”

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2007-2008 global financial crisis. While lowered taxes boosted spending on the UK shelf as late as this year, the whole of the North Sea is a mature production region today, and, as such, might react as quickly to any capital expenditure cuts in the second half of this year.

Furthermore, the market will expect a negative trend break from Russia, which, given sanctions and its isolation, is viewed as unable to keep spending the amounts necessary to sustain its oil production at today's high levels, although a very weak rouble has helped to cushion the oil price fall vis-à-vis the domestic service industry.

So what does this mean for the Middle East? If non-OPEC production falls next year, and the rising demand trend is not derailed by China's problems, the call on OPEC oil could rise to levels not far below the organisation's current production rate. This is the IEA's view in its latest oil monthly. It sees global inventories, which are at record highs after many quarters of a steady build-up, being drawn down from the second half of next year.

This scenario could be good news for OPEC governments that have been building up large budget deficits and seeing costs increasing as a result of falling sovereign debt ratings. There are some major unknowns, however, aside from whether China's economic growth rate is slowing: what will Iran do when sanctions are lifted; and will Iraq manage to increase its oil output further.

Although not a certainty, it looks likely the US, after some political wrangling, will agree the Iranian nuclear deal negotiated in the past few months, clearing the way for a lifting of Iran's oil sanctions. Besides some incremental increases in Iran's existing exports to its remaining Asian clients in the coming months, oil export sanctions are not likely to be materially lifted before the end of 2015, or even by early 2016.

Iran has said that work has started in preparation for a quick ramp-up in production to recoup the 1mn bpd of market share it has lost since 2012 because of sanctions. However, the country's shortage of money



Iran is looking to ramp up production.
(Photo: Christiaan Triebert)

and advanced enhanced oil recovery technology were already problematic 10 years ago. It is unclear how much of this production it has lost permanently due to mature decline, which has been running at around 7 per cent for many years.

“ Longer term, Iran might be able to increase its exports by as much as 700,000 bpd ”

Floating and onshore storage of between 45mn-55mn bpd will help Iran kick start exports: however, recent confirmation that most of the stored liquid is condensate, suggest that at least, initially, Iran's return to the market will have limited impact on overall crude prices. Nevertheless, longer term, i.e. 18 to 24 months, Iran might be able to increase its exports by as much as 700,000 bpd, suggesting that this new supply alone would outweigh the expected US output decline, at least during 2016.

Question marks over Iraq

Another question mark is regarding Iraq. The country's output has continued to grow, despite its fragmentation.

The unwieldy service contracts introduced by the government for international oil companies (IOCs) have created a situation where the government

has to pay IOCs promptly for any work undertaken – which has become too costly. Allowing debts to its oil investors to pile up is likely to deter investments, something which is already starting to happen.

Bottlenecks in Iraq's infrastructure also risk limiting any further growth in the south. Although this is not the case in the north, political instability along the export pipeline to Turkey has again increased, risking large fluctuations of around 500,000 bpd of oil supply from the north throughout next year and beyond.

Meanwhile, Iraqi output hit 4.2mn bpd in July. Political instability meant that level could not be replicated in August. Ongoing development work, however, might still add some more supply in the coming year, even if the risk of disruption seems to be increasing.

As a consequence, any tightening of the global market, expected by many towards the end of 2016 might be delayed further, even if Chinese demand growth does not slow significantly. The irony of such a situation is that the battle for market share could by then be within OPEC itself and largely played out between Saudi Arabia, Iraq and Iran. It could be very damaging in the long term in terms of cooperation within OPEC, and damage particularly Iraq's and Iran's economies and hence stability.

It is also exactly the spectre of this which in the coming 12 months could help to focus minds to find working solutions before energy relations break down completely. ■

China's economic outlook is main cause of oil market uncertainty, finds industry survey

THE OUTLOOK FOR China's economic growth, which is experiencing its worst performance in decades, is the trigger of greatest uncertainty in the global energy markets, according to 32 per cent of respondents in a Gulf Intelligence Survey conducted with 200 industry professionals.

Even at the Chinese government's targeted growth rate of seven per cent for this year, China's economy is heading for its slowest annual expansion in a quarter of a century. Producer prices slumped 5.4 per cent in July, credit to the real economy plunged and consumer inflation remains at about half the target of three per cent this year.

Top energy industry officials and executives from the Gulf's national oil companies, including ADNOC, ENOC and KPC, alongside their international

peers from Vitol, Gulf Petrochem, Socar Aurora, the Dubai Mercantile Exchange and Platts participated in the industry survey conducted in mid-September by Gulf Intelligence Research.

Brent crude oil prices are expected to continue to experience dramatic swings through 2016, according to 56 per cent of the survey respondents, with Brent crude expected to average in the US\$50 range according to 42 per cent of the respondents, while 2 per cent are more optimistic in their outlook, forecasting oil prices to average in the US\$60 range.

31 per cent of the survey respondents believe that uncertainties over OPEC's commitment to maintain its strategy of protecting market share is the main cause of volatility in the oil markets.

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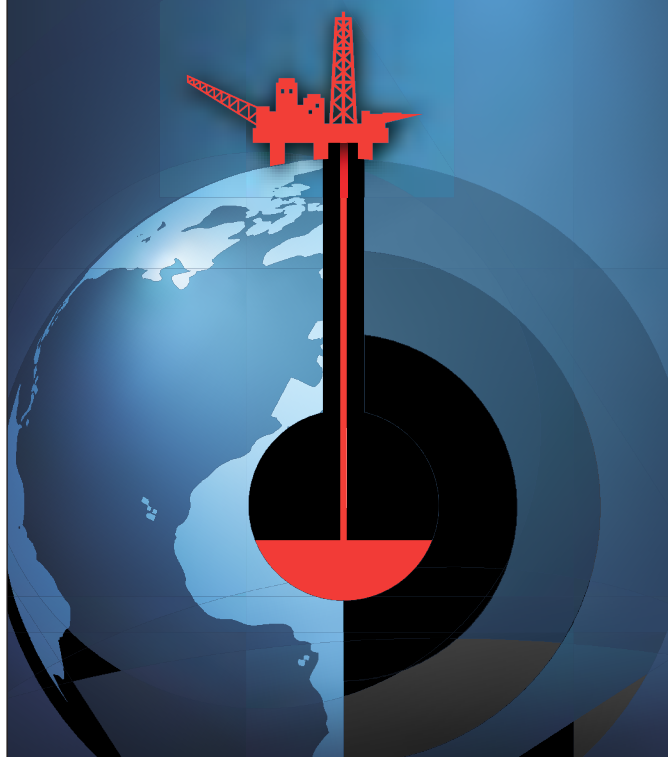
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→ Analysis

Moody's outlook for oil and gas companies' earnings remains negative

PLUMMETING OIL PRICES will cause cash flow for the global integrated oil and gas industry to contract by 20 per cent or more for 2015, with only a modest recovery expected in 2016, say Moody's Investors Service. This reflects the rating agency's expectation of continued revenue declines and a negative free cash flow profile for the industry in 2015. Moody's outlook for the global integrated oil and gas industry will remain negative into 2016.

Moody's report, entitled *Integrated Oil & Gas Industry – Global Negative Free Cash Flow Pressures Integrated Oil Credit Profiles*, discusses how global crude oil prices have fallen by more than 50 per cent since mid-2014, putting a major squeeze on the industry's earnings. While companies like Shell, Total and BP have responded by cutting capital spending and reducing costs, Moody's still expects the industry to face a negative free cash flow position of nearly \$80bn for the rest of 2015, compared with \$26bn in 2014.

"We have revised our oil price outlook down several times since late 2014 and expect oil and gas prices to stay near recent low levels well into 2016, which will aggravate the industry's negative free cash flow profile," says Thomas Coleman, a Moody's senior vice president and author of the report.



The decline in oil prices has squeezed industry earnings
(Photo: iiuri/shutterstock)

Moody's expects the industry to reduce capital spending further, with sharper reductions likely to take place in 2016. Companies continue to re-phase, defer and cancel high-cost projects as prospects dim for price recovery in 2016.

Inflationary pressures and high industry costs are starting to adjust to lower oil and gas prices, with operating costs and margins expected to normalise by mid-to-late 2016. The integrated oil companies are focused on operating costs and staff reductions and have pricing power in an oversupplied market to capture lower rig day rates and supply chain and other efficiencies to bring down costs.

Moody's expects that the industry's total debt load will increase, with cash balances declining as companies sell assets to cover dividends and capital spending, although most companies have resisted dividend cuts so far. While some companies such as Shell, Chevron and Statoil face sizeable debt increases, most players are well positioned to absorb a rise in leverage. Many are also pursuing sizeable asset sales to cover the cash flow gap and enhance capital discipline.

Moody's report is available at www.moody.com.

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Partnering for productivity

Intergraph®PP&M, a leading producer of enterprise engineering software, speaks to Abdulhannan M. Karim, senior engineer at YASREF, about YASREF's experience of Intergraph solutions.

EARLIER THIS YEAR, Yanbu Aramco Sinopec Refining Company Ltd. (YASREF), a joint venture between Saudi Aramco and China Petrochemical Corporation (Sinopec), committed to implementing Intergraph® SmartPlant® Enterprise solutions to optimise the operation and maintenance of its full-conversion refinery in Saudi Arabia. The refinery will use 400,000 bpd of Arabian heavy crude oil to produce premium transportation fuels, as well as high-value refined products for both international and domestic markets.

Intergraph (INGR): Can you give us some background on YASREF's experience with Intergraph?

Abdulhannan M. Karim (AMK): YASREF conducted very intensive technical and commercial evaluations of Intergraph's SmartPlant Suite along with other competitive products, following which it was decided to go with SmartPlant technology. SmartPlant Engineering tools along with SmartPlant Foundation met all of YASREF's requirements, including data security and integrity. This was accompanied by excellent implementation by Attheeb AISC.

“YASREF has set a record and is considered a role model for similar joint venture mega projects”

INGR: How is Intergraph software being employed in the project, and what benefits have you seen?

AMK: YASREF implemented SmartPlant Foundation as the main depository system to hold all of the project's engineering data and documents. The project started with using the engineering tools SmartPlant® P&ID, SmartPlant Instrumentation, and PDS. Having the deliverables from all EPCs in SmartPlant format, YASREF was able to uphold the integrity of the information on hand, and ensure the availability of the data to all YASREF personnel in the right format at the right time.

Some of the benefits we have already seen are integration with engineering tools and other IT systems, and SAP, IRIS, APMS have supported YASREF's operations, maintenance, and engineering teams. In addition, YASREF is using SmartPlant Fusion

to extract data from documents, increasing efficiency in data management.

INGR: What are your views on the significance of this project for the region and for the global oil and gas industry, especially in light of current challenges?

AMK: The implementation has now been completed and the engineering system is already in place. Due to the swiftness and efficiency of implementation, YASREF has set a record in the region and is considered a role model for similar joint venture mega projects; initiating the project with speed and efficiency means increased productivity and decreased overall costs as the project moves forward.

INGR: What do you consider the most significant issue facing the oil and gas industry at the moment?

AMK: We are all functioning in a very volatile environment. Having the right tools in place helps navigate changes and volatilities in the economic and industrial climates, meaning that no matter what happens, we are equipped to adjust our business effectively.

From an engineering perspective, I believe that creating standards and procedures and increasing knowledge of engineering tools is of top importance. These factors directly influence expenditures, and when expenditures can be stabilised and minimised across all fluctuations, we see business prosper.

INGR: How do you see Intergraph solutions supporting companies like YASREF and Saudi Aramco in overcoming these issues?

AMK: YASREF is pleased to be using Intergraph's solutions – we are receiving outstanding support when it comes to our engineering data. Saudi Aramco has also standardised on Intergraph solutions to enhance its capabilities. We see this becoming a trend for those companies wishing to maximise their productivity and meet the unique challenges of large-scale projects. ■

Intergraph solutions are helping to optimise the operation and maintenance of the YASREF refinery



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Seismic + Non-Seismic. A powerful combination.

Policy changes needed to increase female participation in global energy industry

THE GLOBAL OIL and gas industry should accelerate efforts to empower women and close the sector's gender gap, or risk operational preparedness to tackle 21st century challenges, a study by Gulf Intelligence shows.

There is no doubt that there have been encouraging developments, with leading companies in the Middle East and globally adopting programmes to attract, support and retain women. However, there is still a long way to go; women continue to make up less than 10 per cent of the global oil and gas workforce, and only around three per cent in the Middle East. Even fewer hold engineering or other technical roles. The same is true for board-level positions; a study conducted by PwC found that women occupy only 11 per cent of seats on the board of directors of the world's 100 largest listed oil and gas companies.

In the Gulf Intelligence industry survey, conducted this year with 150 female energy industry executives and associated stakeholders working in the Gulf, over 50 per cent of the respondents expressed the view that under current policies it could take more than 30 years for the global energy industry to achieve gender balance.

The Gulf Intelligence research report, entitled *How to Advance Women in the Global Oil & Gas Industry*, highlights the need for drastic policy changes to correct this imbalance, putting forward a number of recommendations on how best to attract and retain females in the sector. These include creating a flexible work environment; addressing discrimination as well as social and cultural barriers; building a work environment and infrastructure that accommodate female requirements, particularly in operational facilities such as offshore rigs; raising awareness among young female students of the career opportunities; attracting more females with backgrounds in engineering, analytics and IT; and highlighting the role of technology as a gamechanger. Technology has reduced some of the physical demands seen as a barrier to female participation, in particular through the application of automation processes and IT and mobile communications.

"The advancement of females in the oil and gas sector is a critical topic that needs to be discussed in order to achieve a sustainable industry, especially at a time when 50 per cent of petroleum engineers are expected to retire in the next decade with the baby boomer generation," says Dyala Sabbagh, a partner with Gulf Intelligence. "Technology will play a vital role in accelerating a gender balance in the industry."

"It is clear that sustained efforts will have to be made to bolster and retain the female component in the oil and gas industry if



The report says that creating a flexible work environment and addressing discrimination in the workplace would help women advance in the oil and gas workplace (Photo: Bapco)

future challenges such as developing more complex and remote hydrocarbon reservoirs, bridging the talent gap, and accelerating technological innovations and solutions are to be overcome – whether on a global level or in the hydrocarbon-rich Gulf region" comments the report.

The full report can be downloaded at www.thegulfintelligence.com. Promoting and retaining women in the energy sector will be discussed at the HR Forum to take place from 25-27 October in Dubai. See www.hrforumoilandgas.com

'Persistence' key to making it in the oil and gas industry

WOMEN WHO EXUDE confidence and demonstrate persistence are more likely to make it in the oil and gas industry, according to leading female oil and gas industry professionals working in the Middle East region.

Speaking ahead of the ADIPEC 2015 'Women in Industry' Conference, Amna Al Maqtari, a process engineer at the TAKREER Research Centre, which is part of the Petroleum Institute campus, an Abu Dhabi National Oil Company (ADNOC) educational centre, said, "Don't take no for an answer. If someone tells you that you cannot do something on the basis that you are a woman, don't just walk away. Insist that you are capable of doing it yourself, and you will



TAKREER Research Centre process engineer Amna Al Maqtari

find that most times, people will listen."

Mariam Al Badr, director of corporate communications at Dolphin Energy, remarked, "When it comes to oil and gas, there tends to be negative connotations about women as engineers, working offshore and developing a career in the sector. As someone who works in communications I can see that there is a strong need to dispel these misperceptions by engaging more effectively with females and profiling the different opportunities and roles they can assume within the energy sector."

The annual 'Women in Industry' Conference will take place the day before ADIPEC 2015 opens, on 8 November at the Eastern Mangroves Hotel & Spa by Anantara in Abu Dhabi.

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Small nation, ambitious plans

Martin Clark examines Kuwait's long-term plans to increase oil production and continue to play a key role in the world's oil markets.

KUWAIT'S SMALL SIZE belies the significance of its rich oil sector, as it ranks among the top tier of global producers worldwide. With production averaging 3.2mn bpd, oil sales account for about 60 per cent of GDP.

As crucial as this massive foreign currency inflow is, it has also created something of an imbalance in the economy, one that remains susceptible to commodity price swings. This has not been helped, at times, by policymaking being held back by political in-fighting and officials grappling with issues that include the controversy surrounding the role of foreign companies in the industry.

The ill-fated Project Kuwait – an attempt to lure more upstream investment from foreign firms 20 years ago – highlights some of these tensions clearly. While international firms are actively involved as partners in the nation's energy sector, it remains an industry dominated by big state-owned entities, headed by holding group Kuwait Petroleum Corporation (KPC).

Leading the oil export industry under KPC is Kuwait Oil Company (KOC). Headquartered in Ahmadi, its responsibilities include the long-term management of the mighty Burgan field, which spans much of Kuwait's south-eastern desert. This vast onshore oil complex is the second largest in the world, behind only Ghawar in Saudi Arabia. Total recoverable oil in this field alone has been estimated at up to 75bn barrels, plus perhaps 70 trillion cubic feet of natural gas. Although more recent reports suggest reserves may now have dipped to 55bn barrels after decades of sustained extraction, it remains a significant resource nonetheless. Kuwait's prized national asset, the Burgan field on its own produces more than half the nation's daily output.

Upstream development

The scale of Kuwait's oil sector, however, means investment is ongoing in new production facilities and associated

*Kuwait is one of the top global oil producers worldwide
(Photo: Khaleel Haldar)*



infrastructure. As well as developing new projects, this also means sustaining output at ageing fields.

“The government wants to see production capacity rise to as much as 4mn bpd by 2020”

The government wants to see production capacity rise to as much as 4mn bpd by 2020, which means KOC and its partners must work hard to extract maximum value from Burgan and the many other fields scattered across Kuwait's desert landscape.

In July, KOC handed a US\$780mn contract to UK-based services group Petrofac for a new manifold group trunkline

(MGT) system in the north of the country. This project forms part of KOC's overall plan to increase and maintain crude output over the next five years.

Three new gathering centres (GCs), which form part of the broader project, are already under construction with Petrofac executing the contract for one of them, GC 29. Each of the three GCs will be capable of producing around 100,000 bpd, plus associated water and gas. The MGT system, due for completion towards the end of 2017, will provide the feedstock to each of the GCs via three independent networks of intermediate manifolds and pipelines.

New horizons

And faced with developing more challenging, mature oil fields, KOC is looking to open up new areas for upstream development as well. It recently embarked on a 3D survey of the Kuwait Bay area in collaboration with China National Petroleum



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Corporation's (CNPC) seismic unit BGP. The survey, which is expected to be completed in June 2017, covers an area of 2,500 sq km stretching from the north of the Burgan field in southern Kuwait to the Bahra field in the north.

The data collected will form part of the company's forward strategy to boost longer-term production through to 2030.

As well as studying new territory, KOC is also getting to grips with the country's unconventional hydrocarbon potential, initiating the Lower Fars heavy oil project, which could lift production by 60,000 bpd by 2018. It recently signed a contract for the implementation of the first phase of the US\$4bn scheme, in the Ratqa field in North Kuwait, with Petrofac and Consolidated Contractors Group (CCC).

KOC chief executive Hashem Hashem called it a milestone for Kuwait, enabling it to produce heavy oil in commercial quantities for the first time.

The company expects to grow its heavy oil technical and operational prowess via the Lower Fars scheme. Hashem says heavy oil development remains one of KOC's strategic objectives right now.

The initial project includes the main central processing facility (CPF) and associated infrastructure as well as a production support complex. This includes a pipeline of almost 162 km which will transport the heavy crude from the CPF to South Tank Farm located in Ahmadi.



Much of Kuwait's recent focus has been on improving its refining sector and downstream industries (Photo: Roy Luck)

“Once completed, the US\$11bn refinery will be one of the largest of its kind in the Middle East”

Downstream growth

Potentially, this heavy oil could then be channelled to a new state-of-the-art refinery currently under development at al-Zour.

Much of Kuwait's recent focus has also

been on improving its refining sector and associated downstream industries. This includes the long-delayed, on-off al-Zour project, an initiative being led by another KPC unit, Kuwait National Petroleum Company (KNPC).

Once completed, the US\$11bn refinery will be one of the largest of its kind in the Middle East with a capacity of 615,000 bpd, effectively double current production.

The new facility would take Kuwait's refining powers from around 730,000 bpd currently to 1.4mn bpd and allow it to produce a whole slate of more sophisticated fuel products.

But al-Zour has been delayed repeatedly

too amid political interference, bidding and corruption issues. Not for the first time, contracts have again been awarded – to a brigade of international contractors from across Asia, Europe and the USA – to take the scheme forward once more. If all goes ahead as planned, the refinery could finally be up and running by late 2018 or early 2019.

KNPC has faced other challenges as well, including a blemished safety record following a succession of accidents and fires at its other refining sites. A fire in August shut down the 200,000 bpd Shuaiba refinery, 50 km south of Kuwait City, in what was the latest of a string of incidents, although no one was harmed.

It illustrates the challenges Kuwait's national energy companies face in maintaining and updating an ageing energy infrastructure and, at the same time, stepping into new areas like heavy oil production and cleaner fuels.

Not all are optimistic. The International Energy Agency said last year that it thinks Kuwait's 2020 targets were unrealistic “given the near total absence of development projects on the books”, something Kuwaiti officials refute. The challenge now for KPC and its multiple subsidiary units is to prove them wrong. ■

Kuwait facts and figures, 2014

Oil reserves:	104bn barrels (sixth largest in the world)
Oil production:	3.1mn bpd (ninth in the world)
Producing wells:	1,760
Crude oil exports:	1,995,000 bpd
Value of oil exports:	US\$97.5bn (95 per cent of total exports)
Gas reserves:	1.8 trillion cubic metres
Gas production:	16.4bn cubic metres
Refined products output:	918,000 bpd
Exports of refined products:	751,000 bpd

Source: BP, OPEC

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Kuwait Oil & Gas Show and Conference

Date: 11–14 October 2015

Venue: Kuwait



Focusing on future hydrocarbon resources

Following the success of the first edition in 2013, the Society of Petroleum Engineers (SPE) Kuwait Oil & Gas Show and Conference is returning to Kuwait from 11–14 October 2015.

SET TO BE the largest gathering of the oil and gas industry ever seen in Kuwait, KOGS 2015 will be held at the Kuwait International Fair in Mishref under the patronage of His Highness Sheikh Jaber Mubarak Al-Hamad Al-Sabah, the Prime Minister of the State of Kuwait. It incorporates a multidisciplinary conference programme organised by the Society of Petroleum Engineers (SPE) and a world-class international exhibition of oil and gas hardware and services organised by Allworld Exhibitions' member Arabian Exhibition Management. The event is expected to attract over 3,500 regional and international attendees.

His Excellency Dr. Ali Saleh Al Omair, Minister of Oil and Minister of State for the National Assembly, commented: "I am pleased to announce the Kuwait Ministry of Oil's support for the second edition of the SPE Kuwait Oil & Gas Show and Conference. The stature of this major international oil and gas exhibition and conference befits Kuwait's international standing as one of the world's leading oil-producing nations, and mirrors the great strides we have made both upstream, downstream, and in our overseas activities."

KOGS 2015 conference

The KOGS 2015 conference takes place under the theme *Future Hydrocarbon Resources; Innovations, Technology and Opportunities*, and focuses on key areas of interest for those working in the upstream and downstream sectors in the region, including reservoir management, production operations, sustainable development, drilling and completion technologies, innovation,



The busy exhibition floor at the 2013 show

refining and the petrochemical industries.

The conference opens with a special ceremony on 11 October 2015 at the Hilton Kuwait Resort. The session will begin with

welcome addresses from His Highness Sheikh Jaber Mubarak Al-Hamad Al-Sabah, Kuwait's Prime Minister; His Excellency Dr. Ali Saleh Al-Omair, Kuwait's Minister of Oil and Minister of State for the National Assembly; Nizar Al-Adsani, CEO, Kuwait Petroleum Corporation; Hosnia Hashim, vice president Operations, KUFPEC and Janeen Judah, 2017 SPE President.

Keynote speeches on this year's conference theme will follow, delivered by His Excellency Abdalla Salem El-Badri, secretary general, OPEC; Hashem Hashem, CEO, Kuwait Oil Company, Mohammad Al-Mutairi, CEO, Kuwait National Petroleum Company; Bob Dudley, CEO, BP and Samir Brikho, CEO, Amec Foster Wheeler.

“The stature of this exhibition and conference befits Kuwait's international standing as one of the world's leading oil-producing nations”

More than 180 technical and poster presentations designed to share the knowledge and experience of managing, operating and supplying companies will follow over the subsequent three days of the conference, delivered by over 260 expert speakers from more than 60 companies across 27 countries.

Packed agenda

The packed agenda at KOGS 2015 also includes 4 industry panel sessions and 5 special sessions led by CEOs, managers and presidents of national and international oil companies and the service industry. Discussion topics include industry strategies in the face of unstable oil prices, the role of gas in the region, innovation, overcoming scarcity of resources, refining industry drivers, women's networking, local content and the role of the banking sectors.

Three SPE training courses and two field trips for delegates will also take place in conjunction with KOGS 2015, in addition to a two-day programme of events aimed at the next generation of oil and gas professionals, which will offer high school students and teachers the opportunity to engage and gain valuable career advice.

More than 200 companies from 24 countries will be in attendance at the parallel exhibition which takes place from 12 – 14 October 2015. The 14,000 sq m global showcase features key stakeholders, major players, suppliers and service providers and serves all areas of the oil and gas industry.

Principal exhibitors include ADNOC, BAPCO, Kuwait Petroleum Corporation, Saudi Aramco and EQUATE. Complementing these regional giants is a host of international powerhouses including Amec Foster Wheeler, Baker Hughes, GE Oil & Gas, Halliburton, ONGC, Schlumberger, Shell, Total and Weatherford amongst others who will be exhibiting alongside independent specialist suppliers and distributors from Kuwait and across the globe. The exhibition also features large national groups from France, Egypt and Malaysia.

Nizar M. Al-Adsani, Deputy Chairman, CEO of Kuwait Petroleum Corporation said, "As we continue to expand in all areas of our industry, KOGS 2015 assembles a welcome level of expertise and serves as a timely arena for meaningful discourse and engagement. I am confident that the exchange of knowledge, technology and business prospects at this event will be of great benefit to all participants, whilst contributing to the advancement of our industry." ■

For more information please visit www.kogs2015.com.

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Encouraging prospects in Kuwait

Mohammed Al Fahoum, Petrofac's country manager for Kuwait, speaks to *Oil Review* about the company's extensive operations in the country.

How significant is your Kuwait business in terms of your global activity?

With a track record in Kuwait extending over the last 15 years and some 12 projects in our portfolio, the country is one of Petrofac's core markets and is of strategic importance to Petrofac's ambitions in the Middle East.

What is the scope of your current projects in Kuwait?

In the upstream sector, around US\$4bn has been set aside by KOC for the first phase of the Lower Fars Heavy Oil Development Programme. Petrofac, in consortium with Greece-based Consolidated Contractors Company, is executing the project, which includes greenfield and brownfield facilities and encompasses engineering, procurement, construction, pre-commissioning, commissioning, start-up and operations and maintenance work for the main central processing facility (CPF) and associated infrastructure, as well as the production support complex. This includes a pipeline of almost 162 kms which will transport the heavy crude from the CPF to South Tank Farm located in Ahmadi, from where KOC has the option to send it to the proposed Al-Zour refinery in the south of Kuwait. The project will take approximately 52 months to complete, and when fully operational it is expected that the initial phase of the Lower Fars heavy oil project will produce around 60,000bpd.

“It will be a competitive landscape for sure, but there is plenty of opportunity”

Petrofac is also executing a project for KOC's manifold group trunkline (MGT) system in the north of Kuwait. The lump-sum engineering, procurement and



Mohammed Al Fahoum, country manager for Kuwait, Petrofac

construction (EPC) project, valued at approximately US\$780mn is integral to KOC's plans to increase and maintain crude production over the next five years. Three new gathering centres (GCs), which form part of the broader project, are already under construction, with Petrofac executing the EPC contract for GC 29 (US\$700 mn). Due for completion towards the end of 2017, the MGT system will provide the feedstock to each of the GCs via three independent networks of intermediate manifolds and pipelines. Each of the three GCs will be capable of producing around 100,000 barrels of oil per day together with associated water and gas.

Downstream, Petrofac is involved with KNPC's Clean Fuels Project; one of KNPC's major investment projects to upgrade the Mina Abdulla and Mina Al Ahmadi refineries, in order to reach a daily production target of around 800,000 bpd. Petrofac, in joint

venture with Korean-based Samsung and CB&I, is working on a US\$3.7bn contract for the Mina Abdulla (MAB1) refinery in Kuwait.

How do you view the future for the development of the country's gas sector?

In terms of opportunities associated with natural gas, ample prospects remain in the country with many of the developments yet to come on stream. It will be a competitive landscape for sure, but there is plenty of opportunity as Kuwait's demand for gas is rising, indicating room for growth in the industry.

Many pipeline projects are underway throughout the northern part of the country and these developments represent a promising expansion.

What are the main challenges you face in Kuwait?

One of the biggest challenges in fully developing expansion projects in Kuwait is simply the shortage of experienced workers.

Another potential challenge as I see it is in relation to the density of projects going on in the northern part of the country. These developments will invariably result in a great deal of additional traffic on the existing road network infrastructure which is being developed as more projects start up. This will be a very busy part of the country and it will be incumbent on all the contractors working there to ensure that safety remains our number one priority.

To what extent is the low oil price environment affecting Petrofac's operations?

Over recent months we have experienced fluctuation of the oil price, cuts in industry capital expenditure and deflationary pressures on the supply chain. While many higher-cost projects in the industry may be cancelled or re-evaluated, at this stage clients in our core onshore markets are continuing to commit to ongoing investment in large strategic projects. ■

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Optimising matrix stimulation treatment

Kuwait Oil Company's new customised carbonate stimulation software will help to optimise well stimulation treatment and minimise costs.

MATRIX STIMULATION FOR carbonate reservoirs is one of the most frequent operations at Kuwait Oil Company (KOC), and is associated with operational and technical challenges in the selection and design of the appropriate stimulation method.

The challenges include selecting the acid type, concentration, dosage and diversion method, as well as the most suitable stimulation technique for each individual well/formation.

The Well Surveillance Group* has created a customised software application to provide a full acid stimulation programme. The software is built based on the KOC database for all carbonate wells. This data went through a sequence of analysis and been grouped based on the reservoir's rock properties, fluid properties, pressure/temperature, fluid compatibility, and formation lithology.

By using the software, the user will be able to define the following for each carbonate reservoir:

- Main acid dosage and the corresponding treated radius (rs)
- Main acid type and concentration
- Diverter method and type (chemical/mechanical diversion, polymer/non-polymer based fluid)
- Pre and post flush dosage and type
- Detailed treatment pumping schedule for any stimulation technique/method (coiled tubing/bullheading).
- Prediction of liquid gain.

As a result, the variation in stimulation designs based on different levels of experience and knowledge will be eliminated. Thus, the chemical dosage will be optimised from the technical/operational perspective, which will help to minimise costs.

The software is divided to five windows, as shown in Figure 1:

- Coiled Tubing: Mechanical Diversion
- Coiled Tubing: Chemical Diversion
- Bullheading: Mechanical Diversion

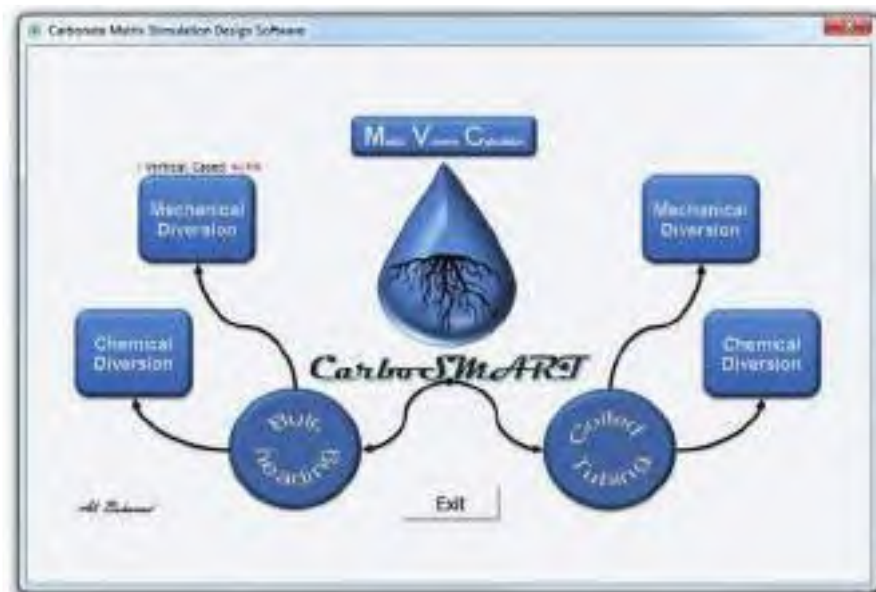


Figure 1: Software front page

Figure 2: Matrix Volume Calculator

Figure 3: First input page

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- Bullheading: Chemical Diversion
- Matrix Volume Calculator

The Matrix Volume Calculator (Figure 2) helps to calculate the required treatment dosage in order to cover the desired treated radius, given the casing OD and reservoir porosity.

As an example, the Coiled Tubing: Chemical Diversion window will be explained in brief.

The window consists of three input pages (Well/Formation Data, Completion Data, Coiled Tubing Data), following which the recommended Treatment Chemicals page will be generated.

The first page includes well data and formation data inputs, as shown in Figure 3. The second page includes “required treatment interval” and “well completion” inputs, as shown in Figure 4. The third page includes “coiled tubing data” input, as shown in Figure 5. The last page is the recommended treatment chemicals systems required, as shown in Figure 6. The user is able to change the design as well.

Finally, a full proposal report will be generated in PDF format as shown in Figure 7. The proposal will include the following :

- 1) Title Page
- 2) Well/Formation Data
- 3) Treatment Interval
- 4) Completion/Coiled Tubing Data
- 5) Treatment Chemicals
- 6) Stimulation Treatment Schedule
- 7) Prediction of Liquid Gain. ■

**The carbonate stimulation software was created by Mohammad Al-Othman (Snr. WS Engineer) and Ali Buhamad (WS Engineer), with support from Humoud Al-Mohammad (WS Engineer), Nasser Al-Houti (Snr. WS Engineer), Samir Aloun (Snr. WS Engineer), Khalid Al-Qassar (Snr. WS Engineer) and Sara Al-Qaheem (WS Engineer).*

Figure 4: Second input page

Figure 5: Third input page

Figure 6: Fourth recommendation page

Figure 7: Generated proposal report

KOC introduces own coiled tubing technology

KUWAIT OIL COMPANY (KOC) continues to adopt new and advanced technologies to help achieve its 2030 strategy of increasing oil production to around 4mn bpd . Since taking office, KOC CEO Hashem Hashem has implemented some of his progressive views, particularly in relation to new technologies, sustainability and environmental protection.

KOC has adopted new and developing technologies related to geophysics, oil exploration, production and process optimisation at various facilities. However, acquiring existing technologies, no matter how advanced, is not always the solution to some of the unique challenges being faced by KOC. As a result, the company's teams of engineers and researchers have been encouraged to themselves develop innovative solutions to tackle specific challenges. One such instance is the introduction of its fibre optic coiled tubing straddle packer method.

Inflow control devices (ICDs) are used to balance flow rates in oil wells throughout the company. ICDs dramatically reduce the effect of water and gas breakthrough and optimise production rates. However, other factors can negatively affect the flow rate balance of the ICD. These factors include plugged ICD ports, asphaltene or sand depositions. In addition, water in the

well presents a host of other issues, including scale and corrosion. These factors increase the cost per barrel for the company.

In order to avoid production from water zones containing plugged ports or formation damage, trials were done for coiled tubing or bull heading to pump a treatment that can dissolve or treat the identified damage of the plugged ports. Unfortunately, the results were not satisfactory.

In order to rectify this, KOC looked for a better way for placement across the plugged intervals. Through the tubing straddle packer, and, in a world first, each ICD port was isolated and fluid was only injected into the plugged ports.

The fibre optic coiled tubing straddle packer method was an innovative approach to a particular challenge. This initiative, led by the well surveillance engineering team, represented the first time an application of the combined solution was ever conducted worldwide. Six wells were selected in Minagish and North Kuwait fields that faced the problem of plugged ports of the ICD completion. Three wells showed improved oil production, with more than a 150 per cent oil increase and drop in water cut, while two other wells faced a slight water cut increase. The campaign resulted in the five wells providing a 40 per cent increase in oil production.

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Broadening the remit of intelligent pigs

Martin Bluck, Magnetics Product Manager at PII Pipeline Solutions explains how its next-generation multi-mission inline inspection pig enhances inspection quality and reduces downtime and costs.



The evolution of pipeline inspection tools has continued at a rapid pace

THE EVOLUTION OF inline inspection tools has continued at an impressive pace since their inception in the early 1970s. However, the technology is not an end in itself as it needs to deliver to a very specific brief and demonstrate that pipeline systems are safe and fit for purpose.

In the past, inline inspection tools were developed for a single, specific purpose. Magnetic flux leakage (MFL) pigs were developed for metal loss inspection, while caliper pigs were designed to look for dents and geometric features and mapping systems were used to investigate pipeline positioning. Within each of these types of pig, there were multiple variants, each designed and developed to meet specific industry requirements. At one time, PII Pipeline Solutions had seven different types of MFL systems in operational use, each delivering inspection results to subtly different specifications.

From an operational standpoint, having multiple types of inline inspection tool presents an unwelcome dichotomy. While pipeline operators have a fundamental need for confidence in the quality of the inspection, they must balance this against the downtime caused by every inspection run. For a clean bill of health covering metal loss, dents and pipeline positioning, a minimum of three inspection runs would have had to be completed. This increases downtime and likelihood of a failed run. However, this could be compounded by the need to rerun with one of the other MFL or caliper system variants if the pipeline condition was not as anticipated, further increasing the downtime and costs suffered by the pipeline operator.

Faced with this problem, one of the goals for PII in developing its fourth-generation MFL technology was to reduce the range of pigs in its inventory while enhancing inspection quality, safety, and delivering first-run success.

Compact multi-mission system

As a result of the smart application of this latest technology, PII's next generation of intelligent pig now incorporates MFL, caliper and inertial measurement unit (IMU) mapping in a single, compact yet

“What used to need three runs can now be completed in a single inspection”

flexible multi-mission system. What used to need three runs can now be completed in a single inspection while offering enhanced levels of accuracy and the flexibility to meet individual client needs, cost effectively.

This has been achieved by optimising the design of each of the three core components of the inline inspection system to gather more data to provide a higher resolution inspection. By reducing the size of the MFL sensors, configuring them in a triax array, while increasing their volume and the sampling frequency, an unprecedented level of inspection accuracy can be achieved. The same is true for the caliper and IMU modules. By running every inspection with the same set-up at maximum resolution, the probability of first-run success can also be improved, whatever the customer's specific requirements. However, to make the service cost effective for the customer, only the datasets necessary to meet the required specification are analysed.

Tailor-made analysis

For instance, a customer with a clean pipeline with only isolated areas of corrosion might only need a very simple metal-loss

“ PII's analysts can make a far more informed call on the level of threat ”

inspection, so only a fraction of the MFL data would be used, while the caliper and IMU data would be recorded and stored, but not analysed. However, because the entire data set has been collected at the highest resolution on the initial run, it is possible to revisit the analysis with a revised higher specification and scope without having to rerun the tool. This flexibility allows PII to run different analysis options depending on a customer's specific concerns about their pipeline. Because the analysis can be tailored to the pipeline, its age, location, type of product transported and history, it is a very cost-effective way of protecting the integrity of the assets.

In parallel with the hardware development, PII has invested in analysis software and tools that look at metal loss, geometry and mapping data as one homogenous dataset, so the combined effects can be assessed. With this information readily available, PII's analysts can make a far more informed call on the level of threat, and advise the client so they can take the necessary mitigation measures, thereby further enhancing pipeline safety and security.

PII recently celebrated six years of the fourth-generation MagneScan™ (MFL4) – PII's signature inspection system that has now completed more than 1,000 runs, approaching 50,000km of successful inspection, and with thousands of verified features. From the first run, PII worked with its customers to gather dig verification data



The PII MagneScan super high resolution inspection tool

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The issue of pilferage is becoming a major commercial threat to pipeline operators around the world

to validate and improve published specifications, and to develop new specifications to address specific customer concerns. While there have been improvements in terms of cost, reliability and responsiveness, the sensing mechanisms and the way the system gathers data hasn't changed since the first run in January 2009. This ensures that the latest algorithms, software and specifications can be applied to all previous runs, thereby providing an accurate benchmark for any change in the condition of a pipeline.

Current PII technology can detect, identify size and locate metal loss as shallow as 0.2mm deep and features as small as 2mm in diameter. With the same tool, PII can identify dents as shallow as 2mm deep and 25mm circular diameter which are barely visible to the naked eye. IMU mapping can now identify movement in the pipeline of less than the width of the pipeline itself, with offsets of as little as 150mm being detectable.

'Pinhole' enhancement

The improvement in resolution has also delivered some unexpected benefits. The capability to detect pinholes down to 2mm diameter was formally validated by one of the largest publicly traded international oil and gas companies through a blind test followed by in-field dig verification. The company's interest was not only in pin holes arising from typical corrosion mechanisms, but also from illegal tapping by third parties for product theft. To better address this specific threat, PII enhanced its 'Pinhole' offering to include identification of unauthorised connections to live pipelines where there is the possibility of product being stolen.

The issue of pilferage is becoming a major commercial threat to pipeline operators around the world, and being able to identify where new fixtures and fittings have appeared in a line, particularly when coincident with deep small diameter metal loss, has already proved effective in mitigating this threat.

Circumferential cracking in the girth weld is another major

concern for oil and gas pipeline operators. The capability to detect metal loss in the girth weld area with magnetics technology has been understood since the early 1990s. However, it is only now with the latest high resolution data and algorithms that it has become possible to detect circumferential cracks open by as little as 0.25mm and discriminate from metal loss. This was proven in collaboration with a major Chinese operator in both girth and spiral welds using the latest triax sensor array.

There are implications associated with gathering multiple data-sets at high resolution, the main one being the size of the data files involved. An inspection can now generate up to a terabyte of data. PII has invested heavily in order to build the IT and infrastructure support required to transport, analyse and store such large quantities of data.

Another challenge is the complexity of the new multi-mission tools. With up to 10 times the level of sensing technology of previous tools, the complexity of the system has increased significantly, but it is still required to deliver maximum reliability and first-run success. PII currently delivers first-run success of around 95 per cent, beating the industry benchmark of 90 per cent. However, a five per cent failure rate is still too high, and PII has taken on the challenge to reduce it through operational enhancements and reliability improvements at sub-system component level while remaining cost effective.

Once the inspection is complete, PII undertakes the analysis and delivers the report to the customer within agreed timescales so it can act on it in a timely fashion. The more accurate and reliable the data is, the more benefit can be derived from both an asset management and a commercial standpoint. High levels of confidence in inspection results mean that clients can afford to put less contingency around PII's accuracy and undertake remediation only when strictly necessary.

As inspection technology is now catering for traditional threats to pipeline integrity, the focus has moved to less prevalent threats and new failure modes as pipelines continue to age. Matching inspection system signal data to unusual features found during dig verification and performing pull-through tests in client pipeline spools are two methods by which PII works with customers to identify and optimise inspection system capability to address these new challenges.

Looking to the future, investment in software, algorithms and data mining offer the potential for further exciting developments. ■

“The focus has moved to less prevalent threats and new failure modes as pipelines continue to age”

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Optimising production through sonar surveillance

Mark Cullen, EGIS product line director, Expro, and Patrick Curry, meters general manager, Expro, explain ways of optimising hydrocarbon production using the company's clamp-on sonar technology.

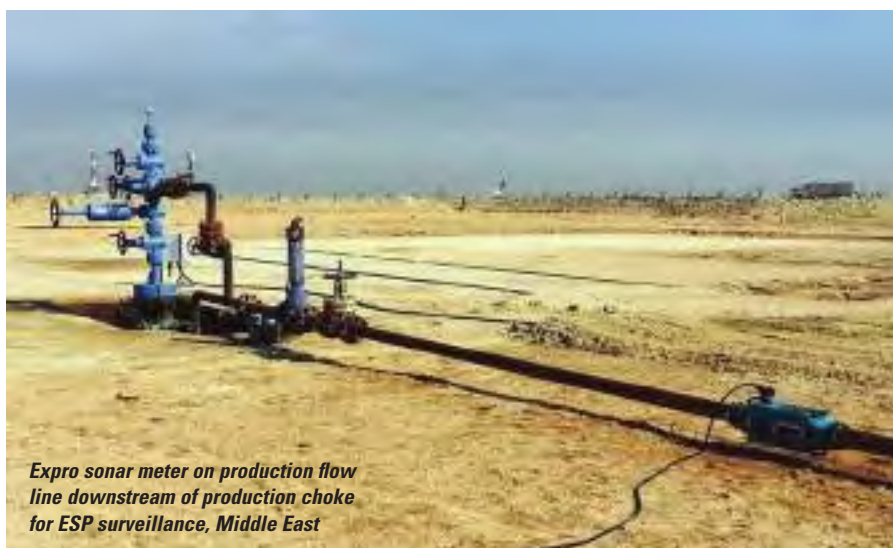
OPERATORS OF FIELDS in the Middle East and North Africa (MENA) are becoming increasingly aware of the importance of monitoring and forecasting tools that integrate production systems into a Field Management and Information System (FMIS). These system implementations optimise field development efforts and focus on maximising the recovery of hydrocarbon reserves. They require accurate and reliable models to predict the effects of operational decisions on the performance of the reservoir, wells, surface production volumes, gathering network, booster compressor stations and central processing facilities. The ability to accurately predict the outcome of modifications to the system set points is key to successful field operations.

An essential element to maintaining the integrity of these models is the acquisition of accurate flow rate data from the well and surface network. To this end, several large oil field operators in MENA are conducting full field metrology campaigns using clamp-on sonar flow metering to measure wells and facility volumetric data. These scheduled activities are playing a pivotal role in the integrated model (FMIS) tuning and calibration, and, subsequently, improving confidence in the operation and forecasted productivity of these assets.

“Implementation of an FMIS is essential to addressing these production optimisation challenges”

Complex interactions

Production from many fields in MENA is chiefly constrained by reservoir performance, changes to the flow network and fluid treatment capacity. As a result, appropriate determination of the daily



Expro sonar meter on production flow line downstream of production choke for ESP surveillance, Middle East

optimal operating conditions requires examination of the complex interactions of the reservoir, the wells and surface network facilities. Further complexity is added when other field management issues are considered, including problems such as early gas and water breakthrough, flow assurance issues and operational issues through the use of artificial lift methods.

Typical 'real world' production optimisation challenges can include:

- Operators put a new well into production, but see no change in overall field production.
- Field production is limited by back pressure in a particular sector.
- Oil production can fluctuate significantly due to wells producing intermittently.
- Choke settings are not optimised.
- Investments in artificial lift methods are not realising the expected increases in production.
- Candidates for gas lift are constrained due to the impact of increased injection gas volume requirement through the production and injection systems and the need for facility modifications.

Implementation of an FMIS is essential to addressing these production optimisation challenges in a systematic and holistic way. However, actual measured production and injection flow rate data is also essential.

Data acquisition challenges

While beneficial, obtaining timely and accurate wellhead measurements can be challenging due to a range of factors:

- Multiple Conventional Test Separator (CTS) or Multi-Phase Flow Meter (MPFM) packages would be required to accomplish the desired testing frequency. These may not be available and may be cost-prohibitive.
- The production losses/deferral associated with traditional well-testing methodologies may be significant.
- Shutting in wells to rig up test equipment can negatively impact the long-term performance of the well.
- Higher HSE risk associated with the increased number of invasive well tests.
- The amount of gas and oil flared to the atmosphere may exceed environmentally accepted levels unless the existing



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wellhead connections and well-test equipment are modified.

- Security concerns of having large crews of well-test personnel in remote, desert areas.

Most fields do not have permanent wellhead and downstream surveillance infrastructure installed, and, in many cases, the need for this data is satisfied by periodic surveillance testing programmes. The equipment traditionally used for this purpose is either a CTS or MPFM.

To overcome these challenges, several large operators in MENA have opted for periodic injection and production surveillance campaigns using Expro's clamp-on SonarTest™ services.

“SonarTest has been the most popular delivery method in MENA, mainly due to this simple approach”

Clamp-on sonar technology

Across various areas of the globe, operators are adopting sonar technology for acquiring accurate production and injection surveillance data. What makes clamp-on sonar distinctly appropriate for the MENA region is its flexibility and operationally simplistic approach. Expro can deploy clamp-on sonar technology through one of two delivery methods: SonarMonitor™ and SonarTest™.

SonarMonitor gives operators the ability to purchase a flow meter system for permanent installation: the meter is installed, commissioned and tied into the existing facility data acquisition system. This delivery method is suitable for critical applications that require 24/7 flow surveillance for reservoir management. It is also used by operators to non-intrusively replace meters that are faulty or out of operating range, consequently saving the operator costly shut-downs.

The SonarTest method deploys the company's sonar meter and technician on a rental basis for periodic surveillance campaigns or for one-off production/injection well tests. It allows operators to acquire reservoir data periodically for large volumes of wells without the need for capital expenditure. The acquired production data is presented to the client in the form of a SonarTest report. SonarTest has been the most popular delivery method in MENA, mainly due to this simple approach. A complete clamp-on sonar system (equipment, cabling, even personnel) is compact enough to fit in an SUV or



Expro's Meters use SonarTest™, a clamp-on production surveillance service

helicopter, providing accessibility to remote well locations in the desert or offshore. Power from the site infrastructure, SUV vehicle, or a portable power unit can be selected as appropriate to the location. Not only does this simplify logistics, but it also keeps the operations on a low profile when moving to location and while operating; important when considering relations with local stakeholders and remaining discreet for security purposes.

The sonar meter is typically clamped on the pipe in about one hour, allowing for a relatively quick installation and commissioning. Within meter installation guidelines, the sonar meter can be installed on the pipe anywhere at the wellhead, either upstream or downstream of the choke. The clamp-on non-intrusive nature of the meter eliminates any pressure drop and production loss, and minimises the HSE risks associated with invasive well-testing methods.

The duration of the test may vary depending on the stability of the flow conditions. In general, an assumption of one test per day is reasonable. Multi-rate tests are also possible on an intra-day basis, provided the flow is stabilised at each rate. This enables testing the wells at various choke settings and/or electric submersible pump (ESP) frequencies with the goal of determining the settings resulting in optimum production.

In one MENA onshore field, sonar has been employed to measure gas lift rates while measuring production rates using CTS. The field operator is correlating gas lift with production rates in an effort to optimise production. In the same field, Expro is using SonarTest to measure gas injection rates at the wellhead and upstream at the manifold origin locations to provide a sector-wide view of gas injection rates.

In addition, in this field Expro is using its

ActiveSONAR meters to measure the water injection rates. This clamp-on technology uses pulsed-array sensors to track the speed of coherent flow structures. All of the data gathered is then summarised and reported to the operator's subsurface team and fed into their FMIS.

In another large onshore oil field in MENA, Expro has been contracted to periodically measure the production rates using SonarTest. Production data has been collected from hundreds of wells, many at multiple choke settings. The data collected is used by the operator's subsurface engineering team to validate, tune and improve production and reservoir models. Many of the wells in this field are ESP lifted. ESP performance is modelled using pump parameters and theoretical pump performance curves provided by the supplier. Theoretical pump curves make certain assumptions with regard to pump efficiency, the mechanical integrity of the pump and reservoir deliverability.

The most useful tool to measure, analyse and, ultimately, improve the performance of an ESP system is to measure the actual pump flow rate from the well. Additionally, many failures of these systems occur at start-up for a variety of reasons. Production surveillance at the wellhead during commissioning can help confirm successful installation of the ESP.

Field management information systems are used to optimise production, which is especially important in a challenging industry environment. Actual flow rate data, both well production and injection and lift rates, are critical inputs into an effective FMIS. Clamp-on sonar flow measurement technology is employed in the MENA region and elsewhere as a cost-effective way to gather the surveillance data required for an effective FMIS. ■

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The growing focus on offshore production

In line with the regional and global focus on developing offshore production, ADIPEC will be launching a dedicated Offshore, Marine and Heavy Equipment Zone at this year's event.

OFFSHORE RESERVES WILL account for around 50 per cent of total oil production in Abu Dhabi by 2018 as a result of continued investments in production capacity, say experts.

With US\$25bn of investments in offshore oil projects planned by the Abu Dhabi National Oil Company (ADNOC) over the next five years, developments in research and technology are becoming ever more critical to preserving the sector as a valuable energy resource, say industry leaders. The ADNOC investment is part of the UAE's strategy to boost its total oil output capacity to 3.5mn bpd by 2017-18 from the current 2.8mn bpd.

Currently, an estimated 40 per cent of oil produced in Abu Dhabi comes from offshore reserves; however, sources say that figure will rise to 50 per cent in the next three years. Globally, about 30 per cent of oil produced worldwide comes from offshore oil wells, and offshore resources are playing a greater role in supplying the rising demand for energy, with a growing interest in the potential of deep water reserves.

According to figures from a 2014 report by Total, deep offshore is believed to contain more than five per cent – an estimated 300bn barrels – of the world's liquid hydrocarbon resources, or 12 per cent of total conventional oil resources. In 2013, deep water liquid reserves accounted for six per cent of global production. That share is forecast to rise to close to 11 per cent of conventional oil output, or 9mn bpd, by 2035, according to the same document.

In line with regional and global efforts to continue exploring and developing offshore production, the Abu Dhabi International Petroleum Exhibition and Conference



Al-Hail Enterprise on the Nasr offshore field

(ADIPEC) will be launching a dedicated Offshore, Marine and Heavy Equipment Zone at this year's event which takes place from 9-12 November.

The new purpose-built area will cover 8,000 gross sq m, including a 500m jetty, providing water access, mooring and quayside exhibition space. More than 200 exhibitors will showcase a host of offshore products and services, including ships, rigs, and vessels, subsea drilling equipment, oceanography and mapping equipment, pipelines and piping components and tools for reservoir production and monitoring.

The inaugural ADIPEC Offshore and Marine Conference, produced and managed by dmg events, will take place in a purpose-built dedicated waterside theatre, where more than 40 industry experts will present valuable offshore oil and gas information.

Three keynote presentations will look at topics including an economic analysis of offshore exploration and production, the role of the shipping industry in the 21st century, and operator cost-reduction

initiatives. Fifteen industry sessions will focus on developments related to shipping, maritime security and safety, pipeline infrastructure and transportation, shallow and deep water exploration and production, oil fields, drilling and completions and technological advances.

National Drilling Company and Det Norske Veritas will host the 11th Annual Regional Rigowners Seminar on 12 November under the theme *Asset Integrity: The New Industry Imperative*.

"With offshore exploration and production on the global agenda, it is crucial we develop sustainable and cost-efficient methods of tapping into this valuable resource," said Christopher Hudson, President – Global Energy, dmg events.

Dagher Al Marar, CEO of the Abu Dhabi offshore services company ESNAAD, and ADIPEC 2015 Offshore and Marine Conference advisory board member, said, "Tapping into offshore oil reserves has always had its challenges, and advances in technology have been helping the industry overcome such challenges." ■

“Offshore resources are playing a greater role in supplying the rising demand for energy”

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Date: 6-7 September 2015

Venue: Dubai



Pushing for better HSE practices in the region

With the increased focus on health and safety in the GCC states, the two-day event explored the trends – ongoing and upcoming.

AT THE INAUGURAL *Middle East Health & Safety Forum*, Dr Ali Salem Al Qaiwani, director of client affairs, Ministry of Labour in the UAE, laid out what best HSE practices governing an organisation should look like, in a keynote speech.

Best practice should be set to lead to the desired result, which is saving lives that can only be driven through educating the workforce – from the CEO down to all departments of the organisation. “Techniques or methodology must be based on experience and research to accomplish the desired outcome – a safer workplace.” Occupational Health and Safety, he said, must be more than companies following specific guidelines like ISO standard, adding that organisations must devise strategies to fit their practices and circumstances rather than blindly following guidelines that may not be suited to their environment.

Al Qaiwani noted that the duty of an organisation is to enlighten all workers with safer work practices. “Do not try to sell safety; educate workers.” By starting at the CEO level, best practice has a much better chance of reaching the whole organisation, he noted.

The need for buy-in

Organised by Alain Charles Managed Events, the event was held at Habtoor Grand Beach Resort & Spa in Dubai and was opened by Waddah Ghanem Al Hashemi, executive director, EHSQ and corporate affairs, Emirates National Oil Company (ENOC). Mr Al Hashemi told the conference, “For the successful implementation of HSE policies, it is necessary for practitioners to communicate effectively using explanations to get buy-in. The trick is to explain why HSE policies are implemented without being too complicated.”

On Day One, the session highlighted the concerns revolving around the health and security aspects of personnel in the region across various industries. It comprised of two panel discussions, the first of which discussed ‘HSE Leadership: Why Health, Safety and Environment is a CEO Issue’.

Moderating the panel, Al Hashemi laid down the points as to why it was imperative for the CEO to play an important role. “In recent years, compliance to HSE has become more prominent because an increasing number of disasters have financially crippled large



The panel session on the second day of the Middle East Health & Safety Forum tackled issues from understanding HSE regulations to behavioural-based safety practices

companies.” Only creating a strong HSE culture in a company can combat this risk, he added.

Elaine Harbour, head of liaison-Middle East, Health & Safety Executive, UAE, stated that accountability starts at the top. Citing the UK as an example, she added that regulation changes have been brought about with regard to health and safety in the country, moving from prescriptive laws to goal-oriented legislation. She said that it is all about the leadership qualities at an organisation that drive HSE policies. “Today, HSE needs to be integral to a company, not just an add-on.”

Saleh Ali Albalooshi, TECOM HSE director noted, “Compliance to safety is very important to UAE.” He cited the example of oil and gas industries in the country and added while the UAE has good track record, not all companies share the same values in terms of safety aspects of their workers. He believes that poor HSE culture often stems from the CEOs who do not involve themselves in safety matters.

Raed Al Marzooqi, head of Occupational Health and Safety, Dubai Municipality, also pointed out that with many nationalities working in the UAE, embedding a good HSE culture is more challenging, “CEOs must be committed to safety compliance in their organisations,” he said, adding that there is a scope for further regulations to drive senior management responsibility for a safer work environment.

Another panel discussion titled ‘Implementing health and safety strategy in a complex work environment’ included noted panellists like Ahmed El Hadidi, chair, IOSH; Benjamin Legg, HSE director, Mace International, UAE; Mathew Cox, chairman, IIRSM ME, UAE; and Michael Anderson, Abu Dhabi Terminals, UAE.

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Legg believed that the HSE practitioners on the ground should be engaged in the process of developing the policy in the first place and be competent. El Hadidi reinforced the point that the most important aspect is to educate the workers who play the most important role in operating plants and projects.

In order to understand and prevent disasters, it is imperative for companies to report incidents so that the root cause can be assessed. Karim P Pachiyannakis from AlMansoori raised this concern and said that most accidents can be prevented if only we know the reasons as to why they occur. "That is why an open and honest reporting culture must be at the heart of all good HSE practice." Rejoy Shamsudeen, corporate QHSE manager at Oman's MB Petroleum, also mirrored the opinion that it is necessary to have good data management in place to be able to make informed decisions on the HSE information that an organisation collects. "It is only by analysing honest and open data on HSE incidents, such as lost time injuries (LTIs) or near misses, that a company can really learn. Then educating the workforce can be much better focused on mitigating the real day-to-day risks that they are facing," Shamsudeen added.

The two-day event covered topics from developing world-class safety culture to understanding the latest regulations and compliance issues in the country. The speakers also included Christian Hopper from CIEK, UK; Tom Foley from ICME; and Clarence Rodriguez from the Petroleum Institute, UAE, among others. ■

For a more detailed round up of the event, please see the next edition of Health, Safety & Security Review magazine (<http://www.hssreview.me>).

"I think this is a great event and I am glad that Alain Charles Managed Events has put together a platform where we can meet like-minded people and work towards a common goal."

— Michael Sudheimer, managing director at ICME Healthcare.

"I think you are a great team and are doing a fantastic job."

— Steven Robinson, global account manager at Enablon.

"For a first time, this is a very good participation and the speakers on the panel were good."

— Ahmed El Hadidi, chair at IOSH.

"The HSE Forum 2015 was an excellent platform for the exchange of some of the latest thinking with respect to effective HSE management and leadership. It was a pleasure and an excellent learning experience for all of us."

The morning panels were able to 'jump-start' the thinking and created an excellent opportunity for the delegates to hear from some of the most informed practitioners within the region, and the information and ideas shared were recent and very much region specific. I was honoured to have been chosen to chair the morning opening panels."

— Waddah Ghanem Al Hashemi, executive director, EHSQ and corporate affairs, Emirates National Oil Company (ENOC).

"These kind of forums help us getting acquainted, share knowledge and continue our pursuit for better practices. The forum, in these terms, helped us get together, keep in touch and meet the best experts in the field to exchange information."

— Dr Ali Salem Al Qaiwani, director of client affairs, Ministry of Labour in the UAE.

DuPont to exhibit new protective garments at A+A

DUPONT PERSONAL PROTECTION will showcase its new Tychem ThermoPro garment at this year's A+A in Dusseldorf at the end of October 2015. The new garment combines DuPont's Tychem and Nomex material technologies in a single-layer solution. The company will also exhibit the latest innovations of its Nomex fabric, Nomex MHP and Nomex DP, which are designed for heat and flame -protective garments for industrial workers.

The Tychem ThermoPro garment is a new addition to the company's chemical protection range. The novel material pairing combines the chemical barrier of Tychem with the flame resistance of Nomex fibre in a single layer, allowing Tychem ThermoPro to provide complete protection against chemicals, flash fire and electric arc. Typical applications are in the oil and gas industry, the chemicals industry, the fire-fighting and emergency response services and other fields in which personnel may be exposed to combined chemical and flame hazards.

Nomex MHP has been designed in response to growing market needs for multi-hazard protection providing mid-performance protection and performance coupled with high wearer comfort. It is suited for applications where users can face multiple hazards such as flash fire, occasional welding/small molten metal splash, arc flash or static build-up. The fabric was developed as an alternative to modacrylic and FR-treated cotton blends. It offers low shrinkage, good abrasion resistance and tensile strength.

At A+A, DuPont will also be providing in-depth information about current and future developments in chemical protective garments of its Tyvek, Tychem and ProShield brands, as well as about heat and flame-protective garments made with Nomex and cut protective gloves and clothing made with Kevlar.

The company will also bring its Thermo-Man to the event. The life-sized mannequin will be dressed in protective garments and exposed to flames from 12 propane gas burners for a live burn test.



Thermo-Man effectively displays the properties of DuPont's fire-protection garments (Photo: DuPont)

Disposable coveralls

GERMANY-BASED SAFETY products group uvex has two disposable coveralls in its Type 3B range, classic and extra vibratex variants, which offer full-body protection for workers in the oil and gas industry.

The Type 3B coveralls are made of light, tightly spun-bound polypropylene-laminate that makes for a highly effective barrier against many organic and inorganic liquid chemicals, making it very useful for the oil and gas industry. The highly durable material is ultrasonically welded and has taped seams to provide maximum safety.

The coveralls are impervious to liquids and provide protection against a wide range of chemicals, while remaining skin-friendly due to the soft-textured non-woven fabric on the inside. The elastic waistband allows for a comfortable, yet tight fit that provides maximum freedom of movement to the wearer. Middle finger loops on the sleeves prevent them from sliding up the arm, while a zipper flap provides optimum protection and a zip puller makes the coverall easy to use.

The Type 3B disposable coveralls from uvex are appropriate for application in many areas, such as oil and petrochemicals, chemical and pharmaceutical industries, industrial cleaning and maintenance work, tank cleaning, work with varnishes and paints and disposal of hazardous materials.



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Protecting key assets from fire

The heightened focus on safety, along with the current drive for cost efficiency, are helping to boost sales of Jotun's Jotachar Passive Fire Protection (PFP) epoxy coating system in the region.

JOTACHAR JF750, THE industry's first mesh-free Passive Fire Protection (PFP) epoxy coating system for structural steel, has attracted substantial orders from some of the big oil and gas operators in the Middle East for the protection of key assets.

Launched two years ago by Jotun, Jotachar JF750 helps users reduce cost and save time while protecting steel structures against a broad range of hydrocarbon fire scenarios, including jet fires. The Jotachar system does not require mesh reinforcement, meaning the required coating thickness for any fire scenario can be applied in a single day, greatly reducing potential downtime, according to the company. When compared to traditional mesh containing products, independent tests show that Jotachar can cut material costs by more than 20 per cent and application time by 60 per cent (on a typical 6,000 sqm project).

Jotachar is fully compliant to the latest revision of Norsok M-501, widely considered to be the industry's most rigorous durability test standard, proving corrosion resistance, material durability, mechanical



Jotun's PFP coating system protects steel structures against a broad range of hydrocarbon fire scenarios

and fire performance after exposure. In addition to certification by all major Classification Societies, Jotachar JF750 is also approved under the Underwriters Laboratories listing scheme for up to 240 minutes protection.

Jotun says that that "many millions of kilograms" of Jotachar JF750 have already been installed since its launch. One recent project award will consume more than half a million kilograms for a major Middle East operator to protect two large offshore units against a broad range of fire scenarios, including jet fires.

"These significant volumes are an indication of the interest Jotachar JF750 has generated in the market," states global PFP sales director Performance Coatings, Andy Czajski. "Third party data and customer experience has shown that Jotachar reduces risk, time and

“Jotachar can cut material costs by more than 20 per cent and application time by 60 per cent on a typical 6,000 sqm project”

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cost during installation and increases safety during operation. Major oil and gas companies are approaching us to protect their high-value assets."

Adding to a long list of third party approvals and certifications, Statoil, known to possess one of the industry's most stringent safety standards, recently approved Jotachar JF750 in their governing document TR 0042.

"Endorsements of this importance open up new opportunities with some of the industry's best-known companies," states Czainski, pointing out that Jotachar's capacity to withstand the highest heat flux jet fires exceeding 350 kW/m² – the only mesh-free PFP epoxy to be successfully tested to this extreme requirement – has been critical in gaining such third party assurance."

The fire protection sector is currently a strong focus for Jotun, in terms both of new builds and maintenance. "Fire protection is a growth area in the region, and while the oil and gas industry is currently experiencing cutbacks, there is no compromise on safety," says Czainski. "While the offshore industry is subject to stringent international legislation, there is now growing safety awareness

onshore, where there is more gas production. This is potentially more hazardous as there is a greater risk of a pressurised incident leading to a jet fire." There is growing interest in Jotun's solutions from downstream operators, and LNG projects offer huge opportunities, he adds.

"There is a drive in the industry to provide protection for higher risk assets against the most intense high heat flux jet fire scenarios," comments Czainski. "Jotachar has proven that it is more than capable exceeding these extreme requirements through rigorous independent tests, actually outlasting the high heat flux test facility during a recent witnessed test."

While increased safety and reduced risk continue to be the primary objectives among operators, the current cost focus in the oil industry underlines the appeal of technologies that are proven to help meet project budgets and schedules. Recent project wins confirm this, says Czainski.

"With oil hovering around the US\$50 mark, reducing downtime is more critical than ever. This is especially the case on maintenance projects, where operators are seeking every opportunity to fast track their assets back to production. In this climate, a fire protection system that is proven to cut application time, while improving safety, is very attractive to asset owners and installers alike.

"We are excited about the opportunities in the near future," he concludes. ■

See our feature on fire protection in the forthcoming issue of our new magazine, *Health, Safety & Security Review Middle East* (www.hssreview.me).

“There is a drive in the industry to provide protection for higher risk assets against the most intense high heat flux jet fire scenarios”

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Keeping compressed air under control

Power consumption is a key consideration for all compressor users. In the oil and gas sector, it is usually more about availability than cost.

COMPRESSOR AVAILABILITY IS very important in oil and gas production. Air of differing qualities can be used to carry out a huge variety of tasks, including driving power tools. Its use with hydrocarbon products is widespread because it is so safe, with minimal risk of ignition involved. Air power is widely used in all forms of extraction of solid minerals, too.

However, safety and convenience come at a cost. Compressors use a lot of power. This is a burden wherever mains supply is involved. Even more so when there are competing demands for the finite output of an engine generating set or synchronised set-up. On oil and gas installations, a single diesel genset is often used exclusively to keep the compressor(s) running. On occasion, a gas turbine has to be relied on instead.

Suppliers maintain that up to a third of the energy used by a typical air-cooled compressor can be saved if the machine is set up optimally. Specifiers often think in terms of the capital cost/operating life trade-off first without taking into account just how much could be saved in the long term by getting the working pressure and air quality outputs right under the most typical operating conditions.

The key consideration is by how much these vary within the specific application, and when it is necessary to have back-up plant standing by to cope with occasional peaks in demand.

“ Maintaining maximum efficiency under average running conditions is the key objective ”

Maintaining maximum efficiency under average running conditions is the key objective. This is normally achieved, firstly,



Compressors are used for a variety of tasks in the oil and gas industry. (Photo: Oleg Sam/Shutterstock)

by assembling a balanced mix of air-consuming equipment that does not require supply above the rated pressure level beyond which power costs start to rise steeply.

Secondly, the need is for an inbuilt control/air management system that ensures the compressor always indicates whenever a critical servicing operation – such as changing oil or a filter, dealing with condensate or tracing a leak – is required. This makes it possible for preventative rather than breakdown maintenance tasks to be carried out when maximum air supply is not needed. This can be during an operation, tool or shift changeover.

By means of such optimisation measures, total maintenance costs can usually be kept down, the compressor's residual or exchange value maximised and the entire system's reliability increased.

Inevitably, however, air consumption requirements vary over time, and not always predictably. This can happen when available manpower changes, a new tool or process is introduced, or an incident occurs.

Sufficient reserve capacity should always be available to permit flexible operation. Not

only will the compressor's own maximum capacity be called on occasionally, but also optimal functioning of all the air treatment and delivery hardware it is connected to as well. The performance of hoses and piping, valves, joints and junctions within the whole network will be particularly important; leaks usually increase over time. This can result in energy losses and avoidable costs or inconvenience creeping up unnoticed.

Without a reliable monitoring system in place, as available from the major suppliers, these can be both invisible and inaudible at a busy work station. Wear/tear, vibration and casual alteration are usually the primary causes, hence the need for planned preventative maintenance.

A complication arises if changes in air quality are called for. Temperature, dust, oil and moisture content are all critical for optimum performance of many operations, tools and costs, and normally it is not possible to supply air simultaneously to meet more than one specification unless a multiple-treatment system is installed.

In the absence of this, a supplementary standby compressor may have to be used so that quality is maintained when the whole system is live. Unless independent peak-shaving plant is installed, capable of delivering air of different quality levels, complementary treatment facilities should be installed to cope when all the available compressors are running.

If improved air quality is needed at just a few outlets, local adaptation to the treatment equipment should suffice, resulting in a system which delivers at different levels. A well-designed one will ensure that meeting increased demand does not result in lower quality overall.

The key point is that compressor managers need to be aware of the complete cost profile of the air they are supplying, and how this will change with demand over time – details which can be displayed by the system's own monitoring software. In the long term, this will make more difference to the bottom line than acquisition costs. ■

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Is Big Data the new energy?

With the continuing uncertainty caused by the oil price collapse, many oil companies will have to revise their corporate strategy, focusing on core assets and cost discipline. This is where having an effective data and technology strategy comes in, says Emmanuel Udeh, subsurface data analyst, Beneprojecti Nigeria Ltd.

ONE KEY LEARNING from the *Big Data Analytics for Oil & Gas* conference held in Abu Dhabi in April, was that real time advanced analytics utilising data and technology will be increasingly important. These analytics are required by the oil and gas industry to maximise efficiencies of existing assets and improve decision-making, as well as reducing cost. According to the Halliburton chief data scientist, Dr. Satyam Priyadarshy, the event had come at the right time to help companies optimise their business value, even with low oil prices.

A clear example is the way today's revolution in computing power is adding value to the analyses of seismic data. BP in 2013 built the world's largest supercomputer for commercial research, which has the capacity to perform 4,000 trillion calculations a second. This means that seismic imaging work that took a geoscientist months just a few years ago can now be done in days.

According to research by Bain & Company, organisations with better analytics capabilities are twice as likely to be among the top financial performers in their industry. They are also five times more likely to make decisions faster and three times more likely to execute decisions as planned, than their peers. Sadly, the research also revealed that only four per cent of oil and gas companies have the talent and skills they need to draw tangible business value from analytics.

Interestingly, some studies show a significant increase in Big Data and technology investments within the oil and gas sector.



Emmanuel Udeh addressing the Big Data Analytics for Oil & Gas conference held in April 2015 in Abu Dhabi

Although this increase in investment is a marked departure from current levels, it is important to note that they are far below the levels in other industries such as aviation, healthcare, telecoms and finance. In the current environment of price uncertainty within the oil and gas industry, companies are seeking ways to derive the most value from current assets and innovative ways to mature newer assets at a minimal cost.

With this desire to improve operational efficiencies, companies have to determine which key performance indicators they seek to address using data. Big Data and technology can help organisations make informed decisions faster and more efficiently because of an increased ability to analyse, model and visualise scenarios, even before they unfold. This helps to optimise maintenance, identify opportunities to maximise production and manage project costs. All these together help to drive innovation and improve operational efficiencies.

Technology alone is not enough

Most executives in the industry agree that successfully harnessing and implementing Big Data initiatives will unlock volumes and add business value by driving efficiency. However,

this alone cannot bridge the efficiency gap. There are important factors which play a central role in achieving this promise:

- The business should ensure that technology deployments are targeted and fit for purpose. Even though technology is a key enabler to aid analysis and provide insights, it is important not to get sucked into the technology trap.
- Existing workflows and processes need to be constantly reviewed in order to prove that the application of these initiatives can provide high-value business solutions.
- The oil and gas industry should recognise data management as a discipline in its own right, rather than continue to see it as a function of IT. Competency frameworks and career development roadmaps for educating and recruiting new and current practitioners should be developed to encourage professionalism and accountability.
- Ultimately, the business must identify its critical data and aim to get the right quality out to the right people at the right time. The biggest obstacle to using real time data is often the quality of the data. Companies should invest in better ways to manage their data for optimum performance.

Low oil prices, rising cost profiles and market volatility have created uncertainty in the industry. Integration, standardisation and collaboration, driven by a visionary and strong corporate leadership, will be the differentiator between well prepared companies and those playing catch-up. ■

These and other issues will be addressed at the Data Driven Visualization Technical Workshop to be held from 11-13 October in Abu Dhabi. This highly interactive workshop will enable data and information managers to learn from industry experience and from each other. See the website at <http://www.ppdmc-course.com> for further information.

“Big Data and technology can help organisations make informed decisions faster and more efficiently”



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Protecting industrial systems and critical infrastructure

Safdar Akhtar, business development leader for Lifecycle Service Solutions, Honeywell Process Solutions, outlines the benefits of the company's latest addition to its cybersolutions portfolio.

THE ADVANCE OF the 'Industrial Internet of Things' era and growing network interconnectivity between operational technology and IT networks have the potential to bring great business benefits. But it also means that critical infrastructure and industrial facilities are increasingly vulnerable to cyber threats and attacks.

According to a Honeywell study, three quarters of surveyed adults across 10 countries are fearful that cyber attacks could damage their country's economy.

In March this year, cyber security firm Symantec revealed that it had observed a multi-staged, targeted attack campaign against energy companies around the world with a focus on the Middle East, while according to a 2014 study by Price Waterhouse Cooper, cybercrimes are the second most common form of economic crime reported in the region.

As IBM comments, over the past few years the conversation has changed from talking about "if you will be hacked" to "when you will be hacked."

“Cybercrimes are the second most common form of economic crime reported in the region”

Heightened awareness

Increasingly, cyber security planning and protection have risen from an operational concern to a CEO and board-level strategic business concern. According to Akhtar, there is in the Middle East a heightened awareness of the risks and a willingness to plan for a secure environment, as a result of several well-publicised security breaches of critical infrastructure. "Oil companies and other industry operators in



Safdar Akhtar, business development leader for Lifecycle Service Solutions, Honeywell Process Solutions

the region are increasingly investing in cyber security solutions to guard against the economic losses and downtime that could result from a cyber attack," he comments.

Akhtar also notes that action is being taken at government level to address cybercrime.

Against this background, Honeywell's recently introduced Industrial Cyber Security Risk Manager, which provides a continuous evaluation of cyber security risks within industrial environments, is being received with open arms in the region, says Akhtar.

"Honeywell is a leader in cybersecurity strategy, having delivered more than a thousand industrial cybersecurity projects globally," he says. "We offer a complete cybersecurity solution to protect industrial plants and operations against cyber threats, through six lifecycles. These lifecycles are based around 'people,

process and technology'. So vulnerabilities around people could concern simple human error, negligence or sabotage, whether by vendor, visitor or employee – essentially, where trust has been compromised," he explains.

"As for processes, cyberattackers will target your weak processes and policies – for example inadequate authorisation policies. While weaknesses around technology include failure to patch or upgrade nodes and computers, thereby introducing system vulnerability.

"The six lifecycles are assessment and audit; architecture and design, where we provide a secure and optimised design based on the results of the detailed audit, based on international or other specified standards; network security, which addresses policy and procedures as well as firewalls and intrusion protection; n-point protection, such as patching, antiviruses and updates to software; situational awareness; and back-up and restore."

It is at the situational awareness stage that Risk Manager comes in, he explains. Designed to proactively monitor, measure and manage cyber security risks for control systems for refineries, plants and other automated production sites, the software platform simplifies the task of identifying areas of cyber security risks, providing real-time visibility, understanding and decision support required for action. Using advanced technologies that translate complex cyber security indicators into clear measurements and key performance indicators (KPI) Risk Manager provides essential information through an easy-to-use interface, allowing users to create customised risk notification alerts and perform detailed threat and vulnerability analysis so that they can focus on managing risks that are most important for reliable plant operations.

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first-of-a-kind software platform," comments Akhtar. "Without it the customer is dependent on yearly audits and monthly network checks which can entail 18 days of lag – this does not give sufficient protection against cyber attacks in real time. Whereas Risk Manager is proactively giving a real-time assessment and an accurate risk scoring of your vulnerabilities and threats – such as insecure network and system configurations, rogue devices, intrusion attempts, malware and so on – with full visibility of your network.

“With Risk Manager industrial customers don’t need to be cybersecurity experts”

“With Risk Manager industrial customers don’t need to be cybersecurity experts,” he adds. “Industrial operators often don’t know what to do with the data they are provided with or what to do if an incident occurs. Risk Manager changes that. It gives guidance on the potential impact of threats and vulnerabilities as well as possible resolutions, making it easier to manage cyber security risks. That is one of its USPs, how easy it is to operate. It is easy to see things, easy to make better and faster decisions to protect your network and avoid cyberattacks.”

Risk Manager is the latest addition to Honeywell’s end-to-end portfolio of professional and managed services for industrial environments. Honeywell Process Solutions has included proprietary cyber protection software for more than 10 years with its leading process



The Risk Manager dashboard

automation solutions. In June it announced its collaboration with Intel Security to bolster protection of critical industrial infrastructure and the Industrial Internet of Things (IIOT). This will combine

the latest advances in cyber security technology with Honeywell’s industrial process domain knowledge to provide enhanced security solutions for the industrial environment. ■

New white paper addresses network security policy enforcement

THE RAPID EXPANSION of vendors connected to manufacturer industrial networks is complicating efforts to manage network access security for plantwide operations. A new white paper from Cisco and Rockwell Automation, *Deploying Identity Services within a Converged Plantwide Ethernet Architecture*, introduces an approach to security policy enforcement that tightly controls access by anyone inside the plant, whether they’re trying to connect via wired or wireless devices.

The approach uses the Cisco Identity Services Engine as part of a Converged Plantwide Ethernet architecture design to centrally manage network access policies, detect unknown or untrusted devices automatically, and enforce authentication and authorisation for employees and contractors.

The white paper is available at www.literature.rockwellautomation.com



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A clearer path in Lebanon

Amanda Jane, Project Manager Lebanon at NEOS Geosolutions, discusses Lebanon's emergence as a frontier hydrocarbon province and the results of a project to map regional prospectivity.

THE EASTERN MEDITERRANEAN region has generated a great deal of interest in recent years, and not just because of the dynamic geopolitical situation. The petroleum industry has been watching the region with a keen eye, as exploration successes in the offshore waters of the EastMed have many intrigued by the potential riches to be unlocked in this newly emerging hydrocarbon province. Noble Energy's 2010 discovery of the Leviathan field, and the reported 16 trillion cubic feet of natural gas it contains, captured the attention of explorationists worldwide. Other discoveries in the EastMed, including Egypt's 'super-giant' offshore gas field last month and the 5-10 tcf Aphrodite field in Cyprus' territorial waters, have only added to the fervour.

While these recent offshore discoveries make it appear that the EastMed is one of the newest regions on the global hydrocarbon stage, it is, in fact, one of the oldest. Syria has a hydrocarbon history that dates back to the days of antiquity, when bitumen on the surface was used to lubricate stone tools and to waterproof crop baskets. Just a few years ago, Syria was producing 400,000 bpd. At 2.5bn barrels, Syria possessed the largest hydrocarbon reserves of any producer in the greater Levant region, except Iraq.

Growing interest

Sitting squarely in the centre of all this activity is Lebanon, a country known for its rich cultural history, vibrant tourist sector and intriguing political mix, as well as its current role in hosting 1.5mn Syrian refugees. What Lebanon has not been known for, however, is the production of oil and gas. Only seven wells have ever been drilled in the country, all of them onshore, and none of them having ever produced in commercial quantities.

“Interest in Lebanon's hydrocarbon potential began to build several years ago”

Interest in Lebanon's hydrocarbon potential began to build several years ago, with the initial focus on the country's offshore prospects in the EastMed just northeast of the Leviathan and Aphrodite discoveries. Spectrum Geophysical and PGS collectively acquired 14,000 line-km of 2-D and 14,000 km² of 3-D seismic data. To date, not a single well has been drilled nor has a single lease block even been awarded as political wrangling has brought the entire offshore block bidding process to a virtual standstill.

Having enriched the country's offshore geophysical database, the Lebanese Petroleum Administration (LPA) turned its attention to gathering geophysical measurements and assessing the hydrocarbon



Figure 1: 6,000 km² survey area covering the northern onshore region and near-shore waters of the Eastern Mediterranean

potential of the country's onshore basins. Initially, the plan was to acquire several hundred line-km of 2-D seismic. However, those plans were scaled back and ultimately never implemented, both because of the geopolitical situation on the ground in certain planned acquisition locations, and because of the challenges to terrestrial geophysical acquisition posed by Lebanon's topography. The country's natural beauty – shaped by rocky hillsides, deep ravines and even snowcapped, 2,500m mountains – are not well suited to seismic vibrator trucks or dozens of juggernauts hauling tons of seismic acquisition gear.

To sidestep these challenges, the LPA turned to NEOS and its local Lebanese partner, Petroserv, to propose an alternative path. The Plan B option that was identified involved acquiring a suite of

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airborne geophysical measurements – including gravity, magnetic, radiometric and hyperspectral – complemented by sub-surface regional resistivity data acquired using ground-based magnetotelluric (MT) receivers. The two-month acquisition operation over a 6,000 km² area of investigation in the northern onshore portion of the country and its near-shore coastal waters concluded earlier this year (Fig. 1). Once processed, the acquired measurements were integrated and simultaneously interpreted with other legacy geological and geophysical (G&G) datasets, including logs from two of the wells in the study area along with some of the offshore seismic data.

“The initial results of the multi-physics project appear to support additional investments in data gathering and G&G analysis”

Promising results

The results, which were shared with the LPA and several cabinet ministers in June, appear very promising. Perhaps the biggest surprise came from the hyperspectral measurements (Fig. 2), which are used to search for indirect and direct hydrocarbon indicators on the surface. The hyperspectral data identified mineral alteration zones often associated with hydrocarbon micro-seepage in large parts of the survey area. Even more telling, the hyperspectral data indicated a large expanse of oil seeps throughout much of the area of investigation. The sheer number of these seeps and their locations along newly mapped fault networks and along the boundaries of key stratigraphic intervals suggest we are dealing with an active (and potentially liquids-prone) hydrocarbon-generating system beneath Lebanon.

Peering down into the subsurface, the interpretation of the multi-physics measurements revealed some other intriguing attributes often associated with prospective frontier exploration areas. These include:

- Evidence of multiple source rock intervals, including those believed to be hydrocarbon-generating in Syria and in the Southern Levant immediately south of Lebanon;

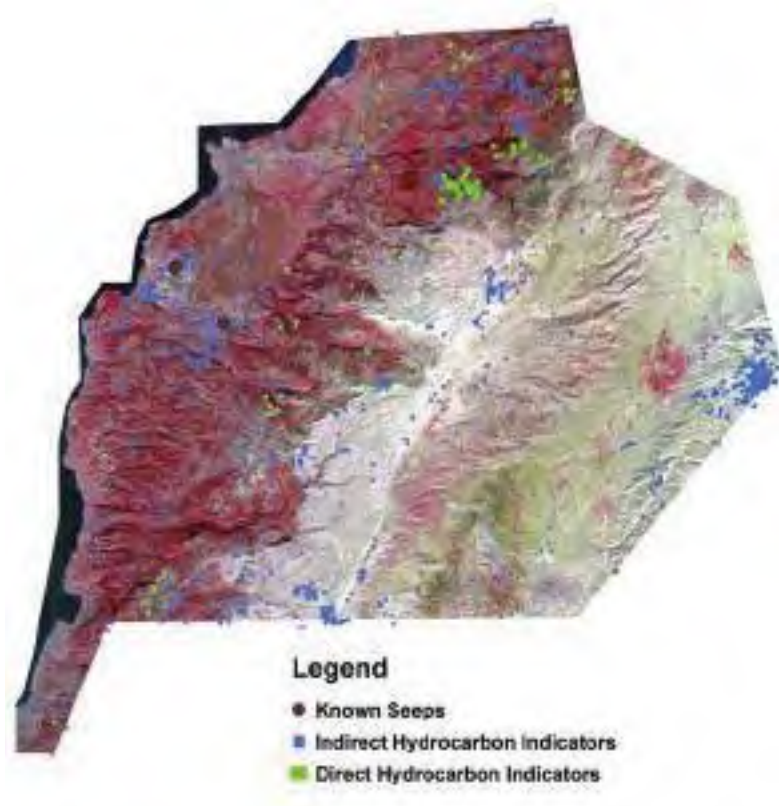


Figure 2: Airborne hyperspectral imaging revealed direct and indirect hydrocarbon indicators, including oil seeps, over a large portion of the survey area

- Evidence of sedimentary depo-centres, reservoir rocks, and typical structural trapping mechanisms such as anticlinal closures and prospective reservoir intervals abutting faults (Fig. 3);
- Evidence of resistivity anomalies within several of the structural traps, potentially indicative of hydrocarbon charge within the prospective reservoir intervals.

The features described were observed at different intervals within the geologic column and in different parts of the area of investigation

– including along the nearshore coastal waters of Lebanon – suggesting a variety of potential exploration play types (including both gas and oil plays) might exist in the country. The multitude of plays and the stacked nature of a couple of them – all of them now highgraded following this project – serve to de-risk the overall exploration opportunity.

Although Lebanon is in the earliest stages of the exploration cycle, the initial results of the multi-physics project appear to support additional investments in data gathering – including targeted seismic acquisition – and G&G analysis to further highgrade the opportunity areas and to identify potential prospects for an initial wave of exploratory drilling, to extend the science ahead of formal tendering processes.

More remains to be done to de-risk the plays in Lebanon, but we may finally have a clearer path forward and be able to celebrate the birth of the country's oil and gas industry. ■

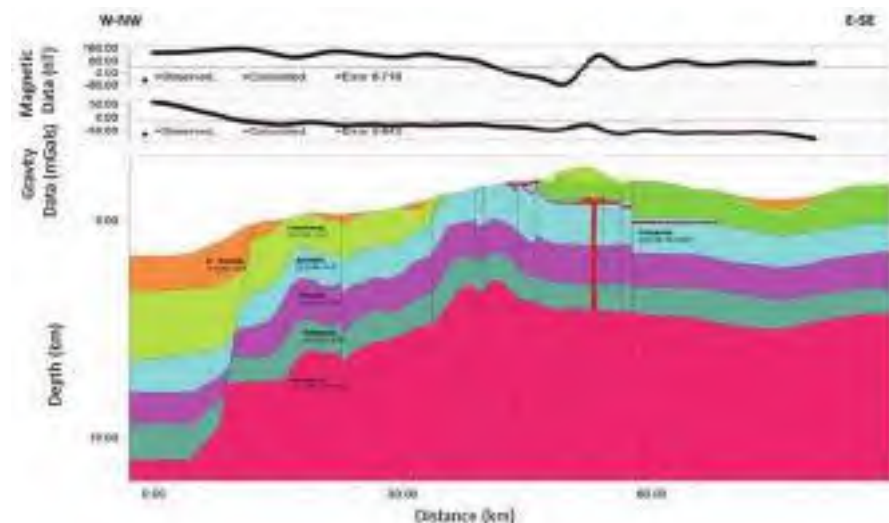


Figure 3: Multi-physics modelling work revealed several promising structural features, including anticlinal highs (adjacent to faults) in the thick Triassic and Paleozoic intervals



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Tratos UK's ultra-touch Tratos JBA showcased at SPE Offshore Europe

TRATOS UK SHOWCASED its ultra-tough subsea Tratos JBA cable range at SPE Offshore Europe in September 2015. The Tratos JBA cables are mud, fire and extreme temperature resistant, and are also resilient to water and mechanical impact.

The challenging environments

of the oil and gas industry require exceptional durability from all equipment, especially cabling that may be permanently open to the elements or used alongside heavy duty, industrial equipment that could cause damage to it.

Tratos, which manufactures across five facilities in the UK and

Italy, is headquartered in the UK and has offices around the world. It has been producing cables to handle low through high voltages for the oil and gas industry for nearly 50 years.

The company also manufactures fibre optic cables and umbilicals, which it has supplied to a large

number of onshore and offshore operations. It provides its clients in the oil and gas industry with both off-the-shelf and custom-designed upstream, downstream and subsea cables.

Wide range

The company's wide range encompasses specialist cables for power, control, signalling and fibre optics, and it also develops composite types that include any or all of these elements. All Tratos offshore cables are tested extensively in laboratory trials and actual installations to prove their reliability.

Tratos manufactures its cables to pass a wide range of standards, such as the UK standard BS6883, IEC 60092-353, Norwegian standard NEK 606 and Eni Italian standard. Tratos JBA cables have also received Type Approval from Lloyd's Register.



The Tratos JBA cables are designed to withstand the harsh conditions in which the oil and gas industry operates (Photo: Tratos Limited)



Packers Plus SF Cementor D manages unique well completion application

THE SF CEMENTOR D stage collar from Canadian oil and gas services company Packers Plus Energy Services is a cementing stage tool typically used in monobore well completions, but was redesigned for a unique application in the Middle East.

Earlier this year, an operator in the Middle East was looking to effectively cement and isolate a water-producing formation that would be encountered in the build section of a sidetrack lateral wellbore. The SF Cementor was redesigned to incorporate a liner hanger packer in the multi-stage completion system. The operator required that a drill pipe dart and wiper plug assembly be used to displace cement through the drill pipe and the liner as well as to close the tool. For this unique application, the SF Cementor D stage tool was redesigned to close with the wiper plug launched from below the liner hanger packer. The system was run and completed successfully as per the operator's programme.

Run as part of an open hole multi-stage completion system, the SF Cementor D stage collar is used to cement-back the vertical and build sections of horizontal well completions. This stage collar is opened hydraulically after the packers have been set, and closed using an actuation ball or specialised wiper plug pumped after the cement has been displaced. The stage collar is specially designed with a built-in secondary sleeve that has no inside diameter restriction. This ensures that all stages can be stimulated and that the production flow-

The SF Cementor D was redesigned to isolate and cement a water-producing formation (Photo: Packers Plus Energy Services)

back is not hindered even if the secondary closure sleeve is used.

Monobore well completions are becoming a common industry practice for the exploitation of unconventional oil and gas reservoirs. With this method, operators can save on the cost of intermediate casing and a liner hanger packer, as well as the number of cleanout trips required and the need to pull out the running string and run in the fracture string for stimulation operations.

In May this year, the company had launched the ePLUS Retina monitoring system. The technology can be used to observe downhole events and their effects on the reservoir. "Uncertainty in downhole

operations can lead to costly delays," said Dan Themig, the company's CEO, during the launch. "In the current context, the Retina system will allow operators to make on-the-fly operational adjustments with real-time data, ensuring a successful stimulation and maximum cost savings."

Packers Plus specialises in providing solutions for multi-stage completion systems and technically challenging applications in horizontal, vertical, multi-lateral and high pressure/high temperature oil and gas wells. Well solutions are customised based on specific requirements of each operator and can be adapted based on changing industry demands.



ERGIL completes equipment delivery for Petronas Iraq project

OILFIELD EQUIPMENT SUPPLIER ERGIL has completed the delivery of equipment to Petronas for a project in the Gharraf oilfield, Iraq. Gharraf is ranked as the fifth-largest oil and gas field in Iraq with reserves estimated at one million barrels of oil equivalent.

The scope of work for the project included one six inches by eight inches skid-mounted pig launcher, complete with interconnecting piping and valves within the skid, one six inches by eight inches skid mounted pig receiver, complete with interconnecting piping and valves within the skid, pig trolleys, jib cranes and spare parts for start-up and commissioning.

Nallinikanth, business development manager at ERGIL for this project, said that the



ERGIL's pig receivers and launchers are easy to use and install, and are made of corrosion-resistant materials

company's association with Petronas on the Gharraf oilfield project had been very promising,

and that the company hopes to be a part of further such projects in the future.

ERGIL's pig receivers and launchers are easy to use and install, and are made of corrosion-resistant materials, providing a complete solution for all pipeline-related jobs, like cleaning, drying, testing and displacement. The company's pig-handling and trolley systems help to handle and unload the pigs safely, thereby reducing work accidents. They are designed and manufactured to meet the specific requirements of each client.

The Turkey-based company has a 32,000 sqm facility in Mersin where it designs, manufactures and tests its products. ERGIL provides solutions for the oil and gas, power, construction and chemical industries, and exports to more than 60 countries around the world.

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Subsea well-sealing kit now ready

US-BASED TRENDSETTER ENGINEERING has completed work on a containment kit that can be deployed to minimise the spillage and associated environmental impact of a subsea well that has gone out of control.

In the cases where an uncontrolled well cannot be sealed, the containment system can be used to flow hydrocarbons from a subsea well to the surface for storage and disposal. During a response, it can be assembled in one, two, or three containment phases as needed.

The toolkit is designed to work alongside standard industry well test hardware, like vessels, well test equipment, drilling riser, BOP, inner string, coil tubing unit, etc. It also incorporates items generally considered to require long-lead times, according to a statement from Trendsetter.

Also included in the kit are a flowline end termination; side-entry flow spool with subsea test tree latch; diver-less subsea connectors; coiled tubing termination head; chemical distribution assembly; deployment reels for flying leads; flexible jumpers/flowlines; topsides transfer pumps and coolers; hose end valves; and offloading hoses.

Trendsetter said the toolkit will be stored in strategic locations around the world to enable timely response. The equipment will be owned by Oil Spill Response Limited and be made available to all operators worldwide on a subscription basis. Its flexible subsea jumpers and subsea flowlines are too large to be transported by air, so three sets will be stored in the UK, Brazil and Singapore.

Disintegrating frac plug launched

BAKER HUGHES HAS released its SPECTRE™ frac plug, the first in the industry to completely disintegrate downhole after fracturing. The plug eliminates coiled tubing (CT) interventions, accelerates completion times and leaves behind an unobstructed production inside diameter (ID) for maximum flow area and easy future access.

“The SPECTRE plug was made possible only through the application of nanotechnology and the marriage of seemingly incompatible properties—high strength and rapid degradability,” said Jim Sessions, vice president of Technology, Completions and Wellbore Intervention at Baker Hughes. “This distinctive combination delivers plug-and-perf efficiency and flexibility that no other plug currently provides.”

As with a traditional frac plug, the SPECTRE plug enables flexible stage placement. But unlike traditional plugs and other disappearing downhole plugs, however, the entire SPECTRE plug—including the plug body, anchoring grip and packing element—disintegrates fully at predictable rates when exposed to wellbore fluids. Complete disintegration ensures that no plug debris are left downhole, thereby protecting the well infrastructure from undissolved components, which can compromise wellbore integrity, restrict access and complicate operations such as future well rejuvenations.

The SPECTRE plug’s innovative design leverages a high-strength, controlled electrolytic metallic (CEM) nanoconstructed material developed by Baker Hughes. Much of the plug body is formed from the same CEM material used in the company’s IN-Tallic™ disintegrating frac balls, which inaugurated an era of higher efficiency for multistage hydraulic fracturing by eliminating the time, cost and health, safety, and environmental risks associated with milling out frac balls. Development locations and plug setting depths are not constrained by the availability and/or finite horizontal reach of CT, allowing operators to access more feet of pay zone, in more locations. The SPECTRE plug’s virtually unlimited treatment depths also enable operators to achieve more reservoir contact per wellbore to reduce surface infrastructure and costs, while creating a more environmentally responsible operating footprint.

Sand-tolerant pump from Weatherford

WEATHERFORD INTERNATIONAL HAS added a sand-tolerant pump (STP) to its artificial-lift solutions offering. The STP is aimed at optimising the life of wells and to arrest the slow decline in production, and is an alternative to standard rod pumps in wells with high sand production. It prevents abrasion caused by sand accumulation in the barrel/plunger, which leads to decreased efficiency or total failure of the pump.

The STP has been designed to operate at depths of up to 2,743m and can perform in temperatures up to 182°C. A unique wiper assembly and filter coupling reduce sand damage by moving sand upward through the pump and away from the critical area of the barrel/plunger interface. Based on results from field trials in sandy conditions, the device has demonstrated up to more than five times longer lifespan than conventional rod pumps, says the company.



The STP lubricates and keeps sand out of the barrel/plunger interface area (Photo: Weatherford International)

Joint Innovation Center launched in Saudi Arabia

HUAWEI, ALONG WITH Saudi Aramco and King Fahad University of Petroleum and Minerals (KFUPM), has launched a Joint Innovation Center (JIC) dedicated to the oil and gas industry.

Located in Dhahran Techno Valley Innovation Center, JIC is committed to

enabling ICT technologies for the oil and gas industry, leveraging Huawei technologies and its global partners’ expertise to meet specific requirements of customers. Huawei is working with leading partners such as Honeywell, Schlumberger, GE, Yokogawa and SAP to develop solutions for the industry.

JIC will focus on digital and intelligent oil fields, digital pipelines, intelligent refineries, high performance computing, big data, mobility, safety and security, cloud computing and energy management. It will also play a key role in knowledge sharing of broad technical industry areas through structured training and knowledge transfer programmes that can effectively add value to Saudi Aramco, KFUPM and other oil and gas companies, as well as to other partners.

Yan Lida, president of Huawei’s enterprise business group, said, “Business is the source of power to determine ICT needs and will ultimately drive ICT infrastructure changes. The key to business-driven ICT infrastructure lies in ‘Ecosystem-based Innovation’, which is reflected in three ways — customers’ business innovations, partners’ industrial application innovations and Huawei’s ICT infrastructure innovations. Huawei will focus on ICT infrastructure that includes cloud computing, pipe, and devices.”



The JIC will help improve the implementation of ICT in the oil and gas industry (Photo: JIC)

SAOGE 2015

Date: 23 - 25 November 2015

Venue: Dammam, Kingdom of Saudi Arabia



SAOGE shows steady growth

Saudi Arabia's biggest oil and gas show returns to Dammam in November as the country presents a slew of opportunities in oil, gas, power and petrochemicals.

THE SEVENTH EDITION of the Saudi Arabia Oil and Gas Exhibition (SAOGE) will be held in Dammam between 23-25 November 2015, bringing the spotlight to the oil-rich nation yet again.

His Royal Highness Prince Saud Bin Naif Bin Abdulaziz, Governor of the Eastern Province, Kingdom of Saudi Arabia will officially inaugurate the show, stated the organisers, adding that 180 companies from 25 countries will host around 8,000 visitors.

Over the years, the oil and gas exhibition has witnessed strong attendance from industry leaders and professionals. 40 per cent of exhibitors have been from the GCC, and the remaining 60 per cent from across the world. Countries represented this year include Azerbaijan, China, India, France, Germany, India, Italy, Korea, Malaysia, Pakistan, Qatar, Russia, UAE, USA and the UK.

The Eastern Province of Saudi Arabia, the centre of the Kingdom's oil industry, provides strategic trade opportunities, said the organisers, making it an ideal show destination.

Saudi Arabia is planning major investments in all sectors including oil, gas, petrochemicals and power. According to the *Arab Oil and Gas Directory*, investments to the tune of US\$90bn in petrochemicals and power generation each, US\$88bn in water desalination and US\$50bn in natural gas-related products are expected to be made in the Kingdom. Huge investments in the oil and gas sector are being made as the Kingdom continues to pump oil at record levels to maintain market share, creating plentiful opportunities for the supply of technology and expertise. Attendees can



The packed exhibition floor at SAOGE 2014

gain access to such opportunities through the three-day show.

Several major companies have confirmed participation in the upcoming seventh edition including key industry players such as China Petroleum Technology & Development Company, Al Estagamah Global Group,

Abdullah H. Shuwayer Sons Trading and Contracting Company, Alfanar, Maxim, Draeger, Pioneer Technical, Saudi Chemical and X-Smart. Draeger has been confirmed as a silver sponsor again, said the organisers. The company is a leader in medical and safety technology with a presence in more than 190 countries.

Organisers are confident that the show will be a useful platform for companies to showcase their latest technologies, and for delegates to build lasting industry relationships. ■

For further details, please see the website at www.saoge.org

“The Eastern Province provides strategic trade opportunities, making it an ideal show destination”

RIG COUNT ←



Middle East & North Africa

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

	THIS MONTH			VARIANCE	LAST MONTH			LASTYEAR		
Country	Land	OffShore	Total	From Last Month	Land	OffShore	Total	Land	OffShore	Total
Middle East										
ABU DHABI	22	16	38	0	22	16	38	25	11	36
DUBAI	0	2	2	0	0	2	2	0	2	2
IRAQ	48	0	48	4	44	0	44	61	0	61
JORDAN	0	0	0	0	0	0	0	0	0	0
KUWAIT	46	0	46	2	44	0	44	45	0	45
OMAN	66	0	66	-1	67	0	67	57	0	57
PAKISTAN	23	0	23	0	23	0	23	19	0	19
QATAR	3	6	9	2	1	6	7	2	7	9
SAUDI ARABIA	98	22	120	-3	104	19	123	97	18	115
SUDAN	0	0	0	0	0	0	0	0	0	0
SYRIA	0	0	0	0	0	0	0	0	0	0
YEMEN	0	0	0	0	0	0	0	3	0	3
TOTAL	306	46	352	4	305	43	348	309	38	347

North Africa

ALGERIA	52	0	52	2	50	0	50	49	0	49
EGYPT	35	6	41	-1	36	6	42	46	16	52
LIBYA	0	1	1	0	0	1	1	4	3	7
TUNISIA	1	0	1	-1	2	0	2	3	0	3
TOTAL	88	7	95	0	88	7	95	102	9	111

Source: Baker Hughes

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS - KUWAIT

Project	City	Facility	Budget (\$US)	Status
EQUATE Petrochemicals Company / Green Carbon Company - Green Carbon Project	Shuaiba	Carbon Dioxide	100,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Acid Gas Removal Plant	Ahmadi	Acid Gas	522,176,000	Construction
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Overview	Ahmadi	Refinery	15,500,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Package 1 (Main Process Plant)	Ahmadi	Refinery	3,000,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Package 2 (Support Process Plant)	Ahmadi	Refinery	3,000,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Package 3 (Utilities and Offsites)	Ahmadi	Refinery	3,000,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Package 4 (Tankage)	Ahmadi	Refinery	3,000,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Package 5 (Marine Facilities)	Ahmadi	Refinery	850,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - Al Zour New Refinery - Soil Reclamation & Treatment Works	Kuwait	Dredging/ Reclamation	700,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Clean Fuels Project - Mina Abdulla Refinery - Phase 1	Mina Abdullah	Refinery	4,000,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Clean Fuels Project - Mina Abdulla Refinery - Phase 2	Mina Abdullah	Refinery	4,000,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Clean Fuels Project - Mina Al Ahmadi Refinery - Phase 3	Mina Al Ahmadi	Refinery	5,000,000,000	Construction
KKuwait National Petroleum Company (KNPC) - Clean Fuels Project - Overview	Various	Refinery	13,000,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Fifth Gas Train in Mina Al Ahmadi Refinery	Mina Al Ahmadi	Gas Production	2,000,000,000	Engineering & Procurement
Kuwait National Petroleum Company (KNPC) - LNG Import and Regasification Terminal	Al Zour	Liquefied Natural Gas (LNG)	333,000,000	EPC ITB
Kuwait National Petroleum Company (KNPC) - LNG Storage & Re-gasification Services	Mina Al Ahmadi	Liquefied Natural Gas (LNG)	250,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Mutla Ridge Project	Mutla Ridge	Oil Storage Tanks	1,000,000,000	Feasibility Study
Kuwait National Petroleum Company (KNPC) - New Depot At Matlaa	Northern Kuwait	Oil Storage Tanks	500,000,000	Design
Kuwait National Petroleum Company (KNPC) - Sulphur Handling Facilites	Mina Al Ahmadi	Sulphur Recovery	600,000,000	Construction
Kuwait National Petroleum Company (KNPC) - Sulphur Recovery Units - Mina Abdulla Refinery	Mina Abdullah	Sulphur Recovery	1,000,000,000	EPC ITB
Kuwait Oil Company (KOC) - Al Zour New Refinery Crude Oil Pipeline	Ahmadi	Oil	800,000,000	EPC ITB
Kuwait Oil Company (KOC) - Booster Station 171 (BS-171)	West Kuwait	Gas Gathering Centre	950,000,000	Construction
Kuwait Oil Company (KOC) - Construction of South East Flowlines	Southeast Kuwait	Flowlines	100,000,000	Construction
KOC - Ratqa Lower Fars Heavy Oil Development - Phase 1	Northern Kuwait	Steam Injection	4,500,000,000	Engineering & Procurement
KOC - Manifold Gathering System - Gathering Centers	Northern Kuwait	Gas Gathering Centre	2,500,000,000	Construction
KOC - Jurassic Oil and Gas Field Development	Northern Kuwait	Oil & Gas Field	1,300,000,000	EPC ITB
KOC - Kuwait Environmental Remediation Program	Kuwait	Oil & Gas Field	3,000,000,000	Construction
KOC - Manifold Gathering System - Gathering Centers	Northern Kuwait	Gas Gathering Centre	2,500,000,000	Construction
KOC - Manifold Group Trunkline (MGT) System	Northern Kuwait	Oil	800,000,000	Engineering & Procurement

Project Databank

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Project Focus

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Project Summary

Project Name	Fifth Gas Train - Mina Al-Ahmadi Refinery
Name of Client	Kuwait National Petroleum Company (KNPC)
Budget (\$ US)	2,000,000,000
Facility Type	Gas Production
Status	Engineering & Procurement
Start Date	Q2-2011
End Date	Q4-2017
Award Date	Q2-2015

Project Background

Mina Al-Ahmadi Refinery Modernization Project (RMP) is intended to provide the local and world markets with low sulphur-content petroleum products, and to reduce dependence on gas as fuel, providing cheaper and more stable fuel to the country's power generation plants.

Project Status

Jul 2015	Engineering works are currently ongoing.
Jun 2015	KNPC raises security levels to its highest on all its refineries and ongoing projects.
May 2015	Tecnicas Reunidas wins contract to build the fifth gas fractionation train at Kuwait's Mina Al-Ahmadi refinery.

Project Scope

The scope of the scheme involves:

- Feed gas compressor
- Feed gas dehydration
- LPG dehydration
- NGL recovery
- Fractionation & product treating unit
- Substation
- Flare system
- Nitrogen generation & distribution system
- Air compression system

The fifth gas train is designed to process associated gas and condensate from KOC gathering centres in southeast Kuwait and north Kuwait oil fields. It will also be supplied with refinery gases from the acid gas removal plants at the two other refineries owned and operated by the KNPC Shuaibah refinery and Mina Abdullah refinery. The renewed scope of the fifth gas train includes:

- Pre-treatment unit
- Natural gas liquid (NGL) recovery unit
- Fractionation column
- Product treatment unit
- Propane refrigeration unit
- Deep refrigeration unit
- Sour water stripper
- De-mineralised water plant
- Fuel gas treatment unit
- Utilities

KNPC has specified that the new gas liquefaction unit should have a design capacity of 805mn cfd of gas and 106.3mn bpd of external condensate, in addition to the condensate produced in the NGL recovery section of the process. Product recoveries should be at least 75 per cent ethane, 97 per cent propane and 99 per cent butane. Current and future non-associated gas from the Jurassic and Dorra gas fields will also be considered in the gas train's design.



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الساحة المتطورة لاتصالات حقول النفط البحرية

أضحى مشغلو الشرق الأوسط أكثر استقبالية لحلول تكنولوجيا الاتصالات اللاسلكية بالنسبة لسيناريوهات حقول النفط البحرية. هذا ما يورده في هذا المقال - أصغر زاندي، المستشار الرئيسي لشركة هواوي الشرق الأوسط.



أصغر زاندي، المستشار الرئيسي في هواوي الشرق الأوسط

متلازمان ولا يمكن الاعتماد على أحدهما دون الآخر. «شركة هواوي تقدم مجموعة كاملة من حلول تكنولوجيا الاتصالات والمعلومات (ICT) لعمليات استكشاف النفط والغاز وإنتاجه ونقله، وإطلاق تقنيات حقول نفط ذكية تهدف إلى تعزيز الكفاءة وحماية العمالة، هذا علاوة على الأصول في الوقت نفسه. وهذه الحلول تتراوح ما بين أنظمة اتصالات التجزئة الرقمية للوسائط القائمة على الشبكات اللاسلكية، والتي تمكن المستخدمين من مراقبة أحوال الموقع آنياً من خلال الجمع بين الخدمات الصوتية والمرئية والبيانية في حزمة واحدة، وحلول خطوط الأنابيب الذكية التي توفر إمكانية الكشف عن الأخطاء والمخاطر، كما توفر أيضاً استجابات تلقائية في حال وجود أي تسرب». ويقول زاندي: «الأمر لا يتعلق فقط بالعملاء، بل يتعلق أيضاً بالشركاء. فنحن نتعاون مع شركات خدمات حقول النفط وشركات الميكنة (التشغيل الأوتوماتيكي) حتى تنظر بعين الاهتمام إلى دمج تلك التقنيات في أجهزتها، وذلك بغرض تقديم حلول متكاملة إلى عملائنا. وسرعان ما سينتقل الأمر إلى الصورة الأكبر: ألا وهي (إنترنت الأشياء) (Internet of Things). فسيكون هناك المزيد من الآلات في الحقول أكثر من ذي قبل، والتي سيتعين أن تكون جميعها متصلة ببعضها الآخر. وبالنسبة لمستقبل الاتصالات اللاسلكية، تصدر هواوي مجال البحث في تكنولوجيا الجيل الخامس من الاتصالات (5G). تلك التكنولوجيا التي ستتيح دعماً متقدماً».

وإرسال البيانات بين منصات الحفر وسفن إنتاج النفط وتخزينه وتوزيعه وناقلات النفط والمحطات البرية، وذلك على نطاق يصل إلى ٣٧ كيلومتراً في الظروف الجوية القاسية، هذا بالإضافة إلى تصميم لشبكة متقدمة يدعم توسيع الخدمة بما في ذلك رفع بيانات كاميرات المراقبة وخدمات مجموعات البيانات اللاسلكية. هذا الحل يعتمد على تكنولوجيا هواوي DBS3900 الغنية بالميزات في نظام BBU+RRU، والذي يبنى تكنولوجيا الاتصالات اللاسلكية المتقدمة؛ مثل تكنولوجيا «مشغل شبكة جوال عالمية» (مينو)، والهوائيات عالية الاستقبال، ومخارج معدات مبادي العميل (CPE)، مع هوائيات خارجية لتحسين مستوى أقصى حد مسموح من خسارة المسار (MAPL) وتوسيع نطاق التغطية. والآن، كنتيجة للتغيرات السريعة في التكنولوجيا، أضحى مشغلو منطقة الشرق الأوسط راغبين. بزيادة. في الانتقال إلى الوسائل اللاسلكية بالنسبة لحقول النفط البحرية، علاوة على الحقول البرية الجديدة. كما بدأ هؤلاء المشغولون في دراسة تلك الخيارات.

ويقول زاندي: «قبل الدخول في السيناريوهات الواقعية، يبحث مشغلو منطقة الشرق الأوسط عن بعض التجارب السابقة للتوصل إلى فهم أفضل لهذه التكنولوجيا، وكيف يمكن تطبيقها في عملياتهم. وسوف نرى قريباً اثنين من هذه المشروعات على أرض الواقع في المنطقة».

ويضيف قائلاً: «أما بالنسبة لقطاع النفط والغاز، تعتبر منطقة الشرق الأوسط هي المنطقة الأولى التي نوليها أكبر اهتمام. فنحن نركز الآن. بقوة. على قطاع النفط والغاز في منطقة الشرق الأوسط، ونعمل عن كثب مع العملاء، ليس فقط في مجال تكنولوجيا الاتصالات اللاسلكية، ولكن أيضاً في مجال معالجة البيانات، والتي تتطلب بدورها إمكانيات حاسوبية ذات أداء عالٍ. ولدينا عددٌ من المنتجات المتوفرة التي تستوفي هذه الشروط، ومعظم المشغلين الآن يريدون تبني تكنولوجيا الحقول النفطية الرقمية، وهذا الأمر يحتاج إلى دعم من بنية تحتية لشبكة اتصالات فعالة؛ فالإنترنت

التكنولوجيا الخاصة بقطاع النفط والغاز آخذة. حالياً. في التطور بشكل سريع، وهذا الأمر يؤثر بدوره على الساحة وعلى المتطلبات الخاصة بحقول النفط البحرية. هناك العديد من المشاكل فيما يخص الكميات الضخمة من البيانات (استقبال كميات ضخمة من البيانات) مثل بيانات المسح الزلزالي المصغر، إضافة إلى الحاجة لنقل تلك البيانات آنياً لتسهيل عملية اتخاذ القرار الدقيق فيما يخص عمليات الحفر والتنقيب والإنتاج. ولأن السلامة من الأولويات القصوى، أضحى المشغولون راغبين بشكل متزايد في أن تصبح منصاتهم تعمل من دون عمالة بشرية. ومرة أخرى سيتطلب الأمر حلاً يعمل على توفير عمليات آنية بوسائل اتصالات.

تشغيل منصات من دون عمالة بشرية واستقبال كميات ضخمة من البيانات يستدعي تأسيس المزيد من معايير الحماية لتلك البيانات، وبالتالي فإن نظام نقل البيانات سوف يتعين أن يكون آمناً بأقصى قدر ممكن. كما أن الطلب يتزايد على مراقبة المنصات بكاميرات الفيديو وذلك لمراقبة أية تهديدات أو أنشطة غير مشروعة، وهذا الأمر يتطلب بدوره الكثير من عرض النطاق الترددي لنقل البيانات.

كل هذه المعايير والتحديات، تتطلب بنية تحتية قوية للاتصالات. وتكنولوجيا الاتصالات اللاسلكية تقدم وسائل مرنة وميسورة التكلفة لتلبية جميع تلك المتطلبات والمعايير. فتكنولوجيا الاتصالات اللاسلكية من الجيل الرابع (4G) واعدة للغاية. فقد خصصت شركة هواوي حلاً للشركات والمؤسسات أطلقت عليه اسم «إنترنت إل.تي.إي» (eLTE)، وهو عبارة عن شبكة لاسلكية متخصصة توفر تغطية شاملة وأماناً كاملاً للبيانات. شركة هواوي تعتبر رائدة في هذه التكنولوجيا، حيث قامت بتطبيق أول شبكة اتصالات لاسلكية من الجيل الرابع لعمليات المنصات البحرية في العالم، وكان ذلك في مشروع يقع في بحر الشمال. وهذا الحل يوفر شبكة آمنة بسرعة إرسال ١ ميجابت في الثانية (Mbps/s) وسرعة استقبال ٢ ميجابت في الثانية (Mbps/s) وذلك لتمكين الاتصالات الصوتية

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الثقيل الدمام



الشركات في حاجة مستمرة إلى توظيف وتطوير المواهب

لازال قطاع النفط والغاز جاذباً كمستقبل مهني مشرق

وفقا لاستطلاع الرأي الأخير، على مستوى قطاع النفط والغاز بأسره والذي أجرته Rigzone، المصدر الإلكتروني العالمي للأخبار وفرص العمل والبيانات والأحداث المتعلقة بقطاع النفط والغاز، لا تزال الغالبية العظمى من المهنيين، العاملين في قطاع النفط والغاز، توصي الأجيال التالية بالعمل في هذا القطاع، وذلك بالرغم مما تعانيه السوق في الآونة الأخيرة من تحديات مرتبطة بانخفاض أسعار النفط. وقد شارك في هذا الاستطلاع، الذي أجرته Rigzone، ما يقرب من ١٠٠٠ مهني عبر ٧٤ دولة وممن يتمتعون بالمهارة. وقد أوصى ٨٤ في المائة من بين هؤلاء المشاركين، بقطاع النفط والغاز كمجال مهني لطلبة المدارس لأسباب عدة ذكروا من بينها. بشكل متكرر. امتياز هذا القطاع بأفاق مستقبلية واعدة ومستقبل مشرق (نظرا لارتفاع معدل الطلب فيه) ومعدلات الأجور المرتفعة. ولغرض تصنيف مجالات الاستثمار تازليا طبقا للأولوية، قام الخبراء في قطاع النفط والغاز بوضع الصحة والسلامة في المقدمة، يليهما تطوير القوى العاملة. كما تم تصنيف برامج تدريب الخريجين كأولوية عليا (في الترتيب الثالث) بالنسبة للخبراء في هذا المجال، وذلك على الرغم من أن أكثر من ثلثي المشاركين في الاستطلاع (٧٦ في المائة) لم يشاركو أنفسهم في هذه البرامج. وما من شك أن الغالبية العظمى (٧٠ في المائة) من المهنيين العاملين في قطاع النفط والغاز، ممن شاركوا في الاستطلاع، يعتقدون في علو قيمة برامج تدريب الخريجين (إن لم تكن قيمة للغاية) وأهميتها البالغة في هذا القطاع. وقال مارك جيست مدير قسم التطوير الاستراتيجي في Rigzone: «نحن نعي تماما بأن الخريجين والمتدربين من مهندسي البترول والبتروكيمياويات يواجهون منافسة قاسية في الحصول على وظائف الدرجة المبدئية وذلك في سوق اليوم المليئة بالتحديات. ولكن ما يقوله هذا الاستطلاع هو أنه حتى في الأوقات الصعبة ما زال هؤلاء المهنيون العاملون في القطاع يؤمنون بحاجة الشركات إلى الاستثمار في الاستمرار في تسخير المواهب الباقية وتطويرها في قطاع النفط والغاز. والأهم من ذلك، وعلى الرغم من الصعوبات الأخيرة التي واجهها القطاع، مازالت القوى العاملة ترى أن هذا القطاع يستمر في تقديم فرص عمل قوية للطلبة وحديثي التخرج». وأضاف جيست قائلاً: «إن مستقبل هذا القطاع سوف يضم أعمال تدوير من أجل الوصول إلى الاحتياجات التي يصعب الوصول إليها، وهذا الأمر بدوره سوف يأتي بتحديات جديدة بينما سيتعين على الشركات سبر أغوار حدود جديدة. والاستثمار المستمر في المواهب المستقبلية هو السبيل الوحيد لضمان تجنب قطاع النفط والغاز العجز في المهارات على المدى المتوسط والبعيد. ويسعدني كثيرا أن أقول إن هذه الدراسة تظهر أن القوى العاملة في هذا القطاع على وعي وفهم تامين بهذه الرسالة». وأشار أغلبية المشاركين في الاستطلاع (٤٦ في المائة) إلى إيمانهم بأن هذا القطاع ملهم (٣٣ في المائة) أو ملهم بشكل كبير (١٣ في المائة) فيما يتعلق بجذب الجيل القادم، بينما أشار ١٠ في المائة من المشاركين إلى أنهم لا يعتقدون بأن هذا القطاع يؤدي ما يكفي لإلهام المواهب الناشئة.

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PTA يعتبر المادة الخام الأساسية في صناعة البوليستر المستخدم في صناعة الأنسجة والتعبئة

بريتيش بتروليوم تمنح ترخيص أحدث تكنولوجيا PTA في عُمان

قامت شركة بريتيش بتروليوم والشركة العمانية الدولية للصناعات البتروكيماوية (أومبيت) (مشروع مشترك بين شركة نفط عمان وإل جي إنترناشونال كوربوريشن وشركة تكامل للاستثمار) بالدخول في اتفاقية منح ترخيص لأحدث أجيال تكنولوجيا بريتيش بتروليوم لتصنيع حمض التيريفثاليك المنقى (PTA). وتعتزم شركة أومبيت إنشاء وحدة إنتاج ١,١ مليون طن سنوياً في صحار لإنتاج حمض التيريفثاليك المنقى، والذي يعتبر المادة الخام الأساسية في صناعة البوليستر المستخدم في صناعة الأنسجة والتعبئة. وقال نك المسلي، مدير العمليات للصناعات البتروكيماوية الخاصة بشركة بريتيش بتروليوم: «هذا الترخيص يعتبر الأول من نوعه لتكنولوجيا خاصة بشركة بريتيش بتروليوم في منطقة الشرق الأوسط، التي تعتبر من المناطق الاستراتيجية والمهمة لشركة بريتيش بتروليوم. وهذا شاهد على المزايا الخاصة بتكنولوجيا بريتيش بتروليوم وعلى خبرتها الواسعة كمصنّع لحمض التيريفثاليك المنقى».

وقال دانيال ليوناردي، نائب رئيس قسم التكنولوجيا والترخيص التابع للصناعات البتروكيماوية التابعة لبريتيش بتروليوم: «سوف تقوم بريتيش بتروليوم بتقديم مجموعة هائلة من الخدمات الفنية وخدمات نقل المعرفة الفنية، إضافة إلى التزامها بمساعدة العمالة العمانية في إطار المشروع المشترك الخاص بشركة أومبيت. وقد تم إنجاز باقة التصميم الهندسي النهائية وتسليمها إلى شركة أومبيت في الموعد المحدد. وإني فخور باختيار أومبيت لتكنولوجيا شركة بريتيش بتروليوم في صناعة حمض التيريفثاليك المنقى». وقال ليوناردي: «إن تكنولوجيا تصنيع حمض التيريفثاليك المنقى الخاصة بنا تعتمد على رأس مال ونفقات تشغيلية أقل بكثير إذا ما قورنت بمعامل تصنيع حمض التيريفثاليك المنقى العادية. فالتقنية الجديدة أكثر كفاءة من حيث استهلاك الطاقة، كما أنها تستهلك كمية أقل من المياه وتخلف كمية أقل من المخلفات الصلبة. ومازلنا مستمرين في الاستثمار بشكل مكثف في تقنيتنا الحصرية. وهذا الأمر سوف يضع تكنولوجيا تصنيع حمض التيريفثاليك المنقى الخاصة بشركة بريتيش بتروليوم في الصدارة على مستوى العالم، وسيجعلها الاختيار الأفضل في المستقبل. وسيستمر تطوير الابتكارات في هذا المجال التكنولوجي وتطبيقها على المستوى العملي، وستكون تلك الابتكارات الجديدة متاحة لكل الأطراف الحاصلة على الترخيص بمن فيهم شركة أومبيت».

قبل أن يستقر على معدل ١,٤ مليون برميل يوميا في عام ٢٠١٦. ويرجع ذلك في الأساس إلى انخفاض أسعار النفط، وإلى وجود خلفية اقتصادية كلية داعمة. ووفقاً لتقرير وكالة الطاقة الدولية، تضخم مخزون النفط لدى منظمة التعاون الاقتصادي والتنمية بزيادة تصل إلى ١٨ مليون برميل يوميا في شهر يوليو/تموز، حيث سجل رقماً قياسياً بوصوله إلى ٢٩٢٣ مليون برميل. وأدى معدل الإنتاج النشط لمعامل التكرير إلى انخفاض مخزون النفط الخام بمعدل ٩,٩ مليون برميل، في حين أضافت المنتجات المكررة ٢٦,٧ مليون برميل للمخزون. وفي نهاية شهر يوليو/تموز، غطى مخزون الإنتاج ٣١,٢ يوم من الطلب المستقبلي، أي ٠,٦ يوم زيادة في نهاية شهر يونيو/حزيران. وتشير البيانات الأولية إلى وجود زيادات محتملة في شهر أغسطس/آب.

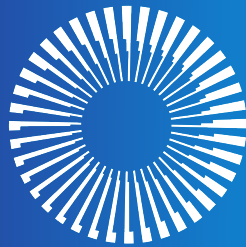


الاكتشاف الجديد قد يؤدي حتى إلى ما هو أكبر منه

إيني تبدأ عمليات الحفر في مصر خلال يناير المقبل

تنوي شركة إيني بدء عمليات الحفر، في مطلع العام المقبل، في حقل الغاز «العملاق» الذي اكتشفته مؤخراً قبالة ساحل مصر. وقد صرح لاجو بيسيتيلي، نائب رئيس شركة إيني الإيطالية، أن عمليات الحفر في حقل الغاز الطبيعي، الذي تم اكتشافه في البلاد قبالة ساحل البحر الأبيض المتوسط، ستبدأ خلال شهر يناير/كانون الثاني عام ٢٠١٦. وأضاف بيسيتيلي أن الشركة ترغب في بدء العمل في هذا الحقل لكي يتسنى لها الاستفادة من هذا الاكتشاف الكبير في أقرب وقت ممكن، مشيراً إلى أن هذا أيضاً سيكون له تأثير إيجابي على الاقتصاد المصري. ومن المحتمل أن يحتوى حقل الغاز هذا على ٣٠ تريليون قدم مكعب من الغاز الطبيعي، مما يجعله أكبر اكتشاف للغاز في مصر والبحر الأبيض المتوسط، وواحداً من أكبر الاكتشافات على مستوى العالم. والتقنية التي استخدمتها شركة إيني للتعقيب عن الغاز الطبيعي في المياه العميقة مكنتها من الحفر بعمق ٤٢٠٠ متر تحت سطح الماء. ووفقاً لتصريحات بيسيتيلي، قد يكون حقل الغاز، الذي جرى اكتشافه مؤخراً قبالة الساحل المصري، مجرد البداية للعديد من الاكتشافات الأخرى الكبرى في مستوى المياه الأكثر عمقا في نفس هذا الحقل. ويمثل هذا الاكتشاف أهمية خاصة بالنسبة لمصر نظراً لما تعانيه من عجز في الطاقة، الأمر الذي اضطرها إلى استيراد الغاز الطبيعي المسال. علماً بأن هذا الحقل الجديد، إلى جانب مساعدته للدولة المصرية في تلبية احتياجاتها من الطاقة لعقود قادمة، من المتوقع له أيضاً أن يساعد الدول الأوروبية التي تحاول تنويع مصادرها من الطاقة.

تحت رعاية صاحب السمو الشيخ خليفة بن زايد آل نهيان رئيس دولة الإمارات العربية المتحدة
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السعودية تحافظ على حصتها في سوق صادرات النفط الخام إلى آسيا



استثمرت السعودية بكثافة في قطاع التكرير

الإنتاج لرفع الأسعار. وبالرغم من ذلك، فقد كانت المملكة، خلال عامي ٢٠١٤ و٢٠١٥، تركز بشكل أكبر على الحفاظ على حصتها في سوق النفط الخام بين عملائها، وخاصة في آسيا، حيث الطفرة الأخيرة التي شهدتها معدل الطلب على الوقود السائل، وفقا لتقييم إدارة معلومات الطاقة الأمريكية.

ففي الفترة من يناير/كانون الثاني إلى يونيو/حزيران ٢٠١٥، بلغ متوسط إجمالي واردات النفط الخام، التي تم التقرير بها من سبع بلدان آسيوية، ١٩ مليون برميل يوميا، أي بزيادة حوالي ٧٠٠ ألف برميل يوميا خلال الفترة نفسها في عام ٢٠١٤. ويبلغ متوسط حصة المملكة العربية السعودية من واردات النفط الخام هذه ٢٣,٢ في المائة مقارنة بنسبة ٢٣,٩ في المائة عن نفس الفترة في عام ٢٠١٤. ولم تشهد حصص واردات النفط الخام للمملكة العربية السعودية أي تغير تقريبا في الصين واليابان والهند وكوريا الجنوبية وتايوان وتايلاند، بينما تراجعت في سنغافورة. ووفقا لتقييم إدارة معلومات الطاقة الأمريكية، قد تؤدي التوجهات طويلة الأجل ضمن قطاع الطاقة المحلي في المملكة العربية السعودية، إلى جانب التنافس مع الدول الأخرى المصدرة للنفط الخام، إلى انخفاض حصة المملكة العربية السعودية في سوق النفط الخام العالمية. هذا وقد استثمرت المملكة بكثافة في قطاع التكرير من أجل الحد من واردات المنتجات النفطية، وتقليل اعتمادها على استخدام النفط الخام لتوليد الطاقة والتحول نحو تصدير المزيد من المنتجات النفطية. علما بأن المملكة العربية السعودية أضافت ٨٠٠ ألف برميل يوميا لسعة التكرير التي تصل حاليا إلى ٢,٩ مليون برميل يوميا تقريبا، وذلك من خلال بدء تشغيل معمل تكرير نفط كبيرين في العاميين الماضيين.

العربية السعودية على مدار تلك الفترة. وحتى خلال فترة انخفاض أسعار النفط الخام العالمية في عامي ٢٠١٤ و٢٠١٥، قامت المملكة العربية السعودية بزيادة إنتاجها وحافظت على مستويات صادراتها عالية، مما مكنها من الحفاظ على حصتها في السوق في هذه البلدان. ومع ذلك، قد تقلل التوجهات طويلة الأجل، ضمن قطاع الطاقة في المملكة العربية السعودية، من حصتها في السوق العالمية للنفط الخام. وفي وقت سابق، خلال فترات وفرة التوريدات العالمية وانخفاض الأسعار، كانت السعودية تميل إلى ضبط مستويات

تناقش إدارة معلومات الطاقة الأمريكية (EIA) في تقريرها الموجز بعنوان «الطاقة اليوم» كيف حافظت المملكة العربية السعودية على حصتها في سوق صادرات النفط الخام إلى آسيا خلال فترة التراجع في أسعار النفط.

يقول التقرير: «صدّرت المملكة العربية السعودية، خلال النصف الأول من عام ٢٠١٥، ٤,٤ مليون برميل يوميا في المتوسط من النفط الخام إلى سبعة شركاء تجاريين رئيسيين في آسيا، وهو ما يشكل زيادة تزيد عن نصف إجمالي صادرات النفط الخام من المملكة

الطاقة الدولية تتوقع انخفاضا في توريدات غير الأعضاء في أوبك

الأعضاء بمنظمة الأوبك، خلال شهر أغسطس/آب، بمعدل ٢٢٠ ألف برميل يوميا، لتصل إلى ٣١,٥٧ مليون برميل يوميا، وذلك نظرا لما حدث من تراجع في توريدات المملكة العربية السعودية والعراق وأنجولا. غير أن إنتاج الدول الأعضاء بمنظمة الأوبك قد زاد بمعدل ١,٢ مليون برميل يوميا، أي أعلى من العام السابق. كما ورد أيضا في التقرير أن «معدل الطلب» على توريدات النفط من الدول الأعضاء بمنظمة الأوبك ازداد إلى ٣١,٣ مليون برميل يوميا في عام ٢٠١٦، أي بما يزيد بمعدل ١,٦ مليون برميل يوميا على نحو سنوي نظرا لأن انخفاض الأسعار أحدث فجوة في توريدات الدول غير الأعضاء بمنظمة الأوبك، وعزز من نمو الطلب القائم على الاتجاه السائد. يجدر بالذكر أنه من المتوقع أن يرتفع معدل طلب النفط على الصعيد العالمي إلى أعلى مستوياته منذ خمس سنوات، وهو ١,٧ مليون برميل يوميا في عام ٢٠١٥، وذلك

كشفت وكالة الطاقة الدولية، في تقريرها عن سوق النفط لشهر سبتمبر/أيلول، أن توريدات الدول غير الأعضاء بمنظمة الأوبك قد تنخفض بما يقرب من ٠,٥ مليون برميل يوميا، وهو ما يعتبر أكبر انخفاض حدث منذ أكثر من عقدين. فقد انخفضت أسعار النفط في شهر أغسطس/آب إلى أدنى مستوياتها منذ ستة أعوام، حيث بلغ سعر البرميل ٤٢ دولارا أمريكيا.

ومن المتوقع أن يؤدي انخفاض الإنتاج في الولايات المتحدة الأمريكية وروسيا وبحر الشمال، إلى انخفاض توريدات الدول غير الأعضاء بمنظمة الأوبك في عام ٢٠١٦ إلى ٥٧,٧ مليون برميل يوميا. وأشار تقرير وكالة الطاقة الدولية، على وجه التحديد، إلى أنه من المتوقع تضائل الإنتاج الأمريكي من النفط الصخري الخفيف بمعدل ٠,٤ مليون برميل يوميا في العام المقبل. وقد تراجعت توريدات النفط الخام من الدول

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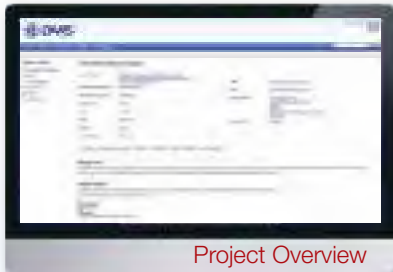
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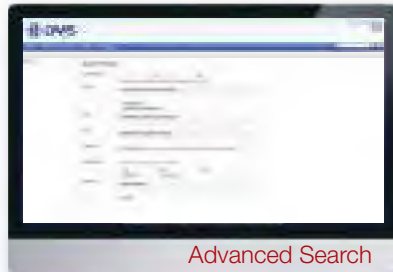
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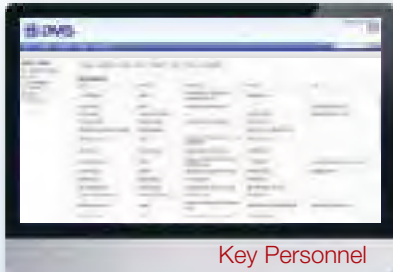
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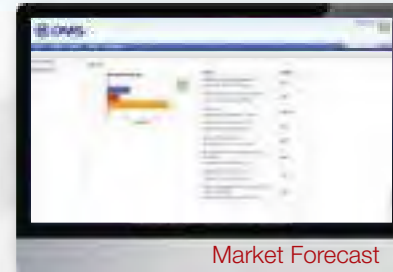
Project Overview



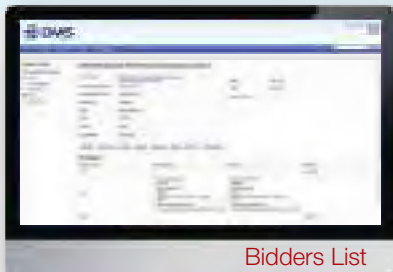
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القسم العربي

أخبار

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ملخص محتويات القسم الإنجليزي:

تقارير خاصة: الكويت، معرض الكويت للنفط والغاز.

استطلاعات: السلامة من الحريق، ملابس الوقاية، التوظيف

والحفاظ على القوة العاملة.

تكنولوجيا: قياس التدفق، سلامة خطوط الأنابيب، التقنية الزلزالية.

الاتصالات وتكنولوجيا المعلومات: الأمن الإلكتروني، البيانات الصخمة.

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• بريتيش بتروليوم تمنح ترخيص أحدث

تكنولوجيا PTA في عُمان

• لازال قطاع النفط والغاز جاذباً

كمستقبل مهلي مشرق