

Oil Review

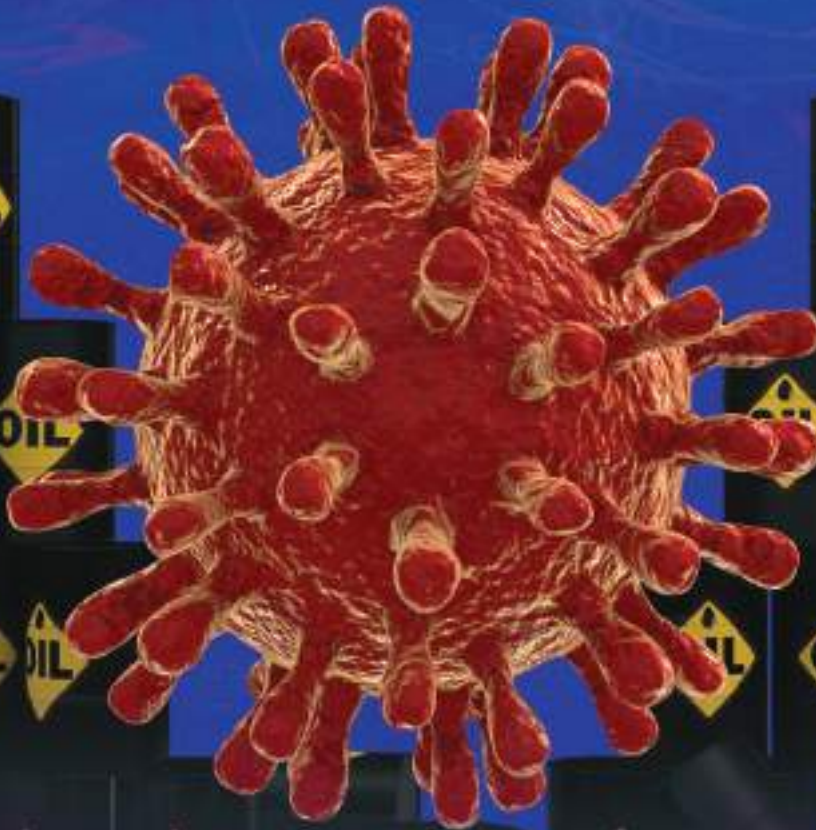
Oil · Gas · Petrochemicals

Middle East

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COVID-19

The impact on oil & gas



- Saudi Aramco - weathering the storm
- Slowing investments in petrochemicals
- Optimising facilities with simulation modelling
- Digital technologies for asset management
- Protecting critical infrastructure

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→ Editor's note

THE COVID-19 PANDEMIC has left scarcely any business untouched, but there is no doubt that the oil and gas industry has been particularly hard hit.

In this issue we look at the impact of the pandemic on the industry, from cancelled or postponed licensing rounds to capex cuts and overflowing inventories. Clearly, some companies are better placed than others to ride out the storm, Saudi Aramco being a prime example, with its strong financial position, low lifting costs and robust business continuity plans (p16).

With the renewed focus on cutting costs, digital and automation technologies can offer scope for enhanced efficiencies and safe operations at a time of volatile market trends and uncertain workforce availability (see our Technology section).

We hope you, your loved ones and colleagues are keeping safe and well at this difficult time.

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A round-up of the latest product advancements in oil and gas

Front cover: Shutterstock

→ Executives' Calendar, 2020

SEPTEMBER			
1-3	World Heavy Oil Congress	MUSCAT	www.worldheavyoilcongress.com
8-10	Gastech	SINGAPORE	www.gastechevent.com
11-14	Iran Int'l Oil, Gas, Refining & Petrochems Show	TEHRAN	www.iran-oilshow.ir/EN
14-15	Kuwait HSE Forum	KUWAIT	www.hse-forum.com
14-16	Oman Petroleum & Energy Show	MUSCAT	www.omanpetroleumandenergyshow.com
14-17	GEO 2020	MANAMA	www.geo-expo.com
28-29	Dubai HSE Forum	DUBAI	www.hse-forum.com
OCTOBER			
6-8	OPEX MENA	MANAMA	www.europetro.com/week/opexmena2020
26-27	Bahrain HSE Forum	MANAMA	www.hse-forum.com
NOVEMBER			
3-5	World LPG Forum	DUBAI	www.worldlpgforum2020.com
9-12	ADIPEC	ABU DHABI	www.adipec.com
16-17	Middle East Petroleum & Gas Conference	MANAMA	www.mpgc.cc

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

OTC 2020 cancelled

AMID CONTINUED HEALTH and travel concerns due to the COVID-19 outbreak, the OTC board of directors have made the decision to cancel the 2020 Offshore Technology Conference.

The board felt this decision was the most feasible and responsible for staff, exhibitors, partners, attendees, and the Houston community.

"As we navigate these difficult and uncertain times, it is with a heavy heart that the OTC board of directors has determined that it is in our best interest to cancel OTC 2020. Our priority is the health and safety of our attendees and exhibitors, and we have taken federal, state, and local guidelines into account in making our decision," stated Cindy Yeilding, OTC chairperson.

Yeilding continued, "As we face this uncharted territory, we remain confident of OTC's critical role in the offshore industry's future and eagerly anticipate a robust OTC 2021."

The organisers stated that to preserve the significant work of the programme committee and authors, the technical papers and presentations will be made available at a later date on OnePetro.org.

Plans will commence for OTC 2021, bringing leading-edge technical information, the industry's largest equipment exhibition, and valuable professional contacts from around the world to Houston. The call for papers will open on 28 May 2020 and the event will be held on 3-6 May 2021.



OTC will return in 2021.

Image Credit: OTC



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Keeping up with developments at a difficult time

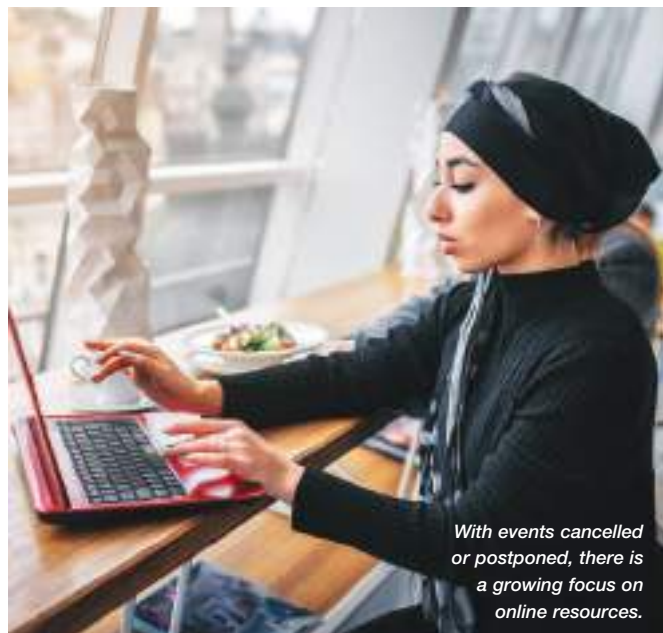


Image Credit : Adobe Stock

With events cancelled or postponed, there is a growing focus on online resources.

DUE TO THE COVID-19 pandemic, and global restrictions on travel and public gatherings, major oil and gas shows have had to be cancelled or rescheduled. These have included GEO2020, Oman Petroleum and Energy Show and the Middle East Petroleum & Gas Conference, originally scheduled to take place in March, which have been postponed to 14-17 September, 14-16 September and 16-17 November respectively. While OTC 2020, due to have taken place in Houston in May 2020, has been cancelled altogether, with the next edition due to take place in May 2021 (see p4).

However, there are a number of free online resources, including insights, podcasts and webinars, that can help you keep abreast of developments and keep your business on track during this challenging period.

Here is just a small selection:

Rystad Energy (www.rystadenergy.com) – oil market updates including a regularly updated free COVID-19 report evaluating the impact of the crisis on global energy markets, and occasional webinars

Westwood Energy Group (www.westwoodenergy.com) – oil industry analysis. It is holding a series of spring webinars (www.westwoodenergy.com/news/westwood-webinars-spring-series)

Oil & Gas Council (www.oilandgascouncil.com/webinars/) – series of webinars in which industry leaders debate key issues and challenges

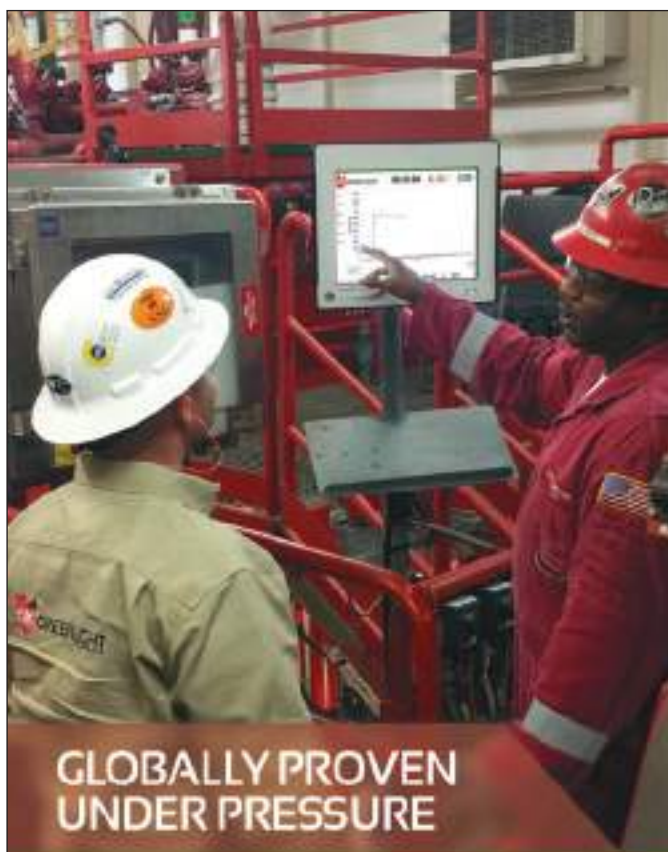
Oxford Business Group (oxfordbusinessgroup.com) – COVID-19 economic impact assessments for 40 countries globally, how they are being affected by the pandemic and what governments and businesses are doing to mitigate the challenges

Economist Intelligence Unit – (<https://www.eiu.com/n/novel-coronavirus-outbreak/>) – impact of the coronavirus on business and trade, with analysis and webinars on how to plan your response

McKinsey (mckinsey.com/featured-insights/coronavirus-leading-through-the-crisis) – insights and guidance on how businesses can respond to the crisis

Control Risks (controlrisks.com/covid-19) – insights, podcasts and webinars on topics ranging from crisis response to cyber security.

Last, but by no means least, our own magazines and websites will keep you updated with the latest news and analysis, at www.oilreviewmiddleeast.com, www.technicalreviewmiddleeast.com, www.hssreview.com, www.oilreviewafrica.com, www.africanreview.com, www.communicationsafrica.com, www.africanfarming.net and www.fareasternagriculture.com.



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Oversupply concerns remain despite cuts

THE HISTORIC DEAL to cut production reached by OPEC and its allies in the OPEC+ group, with the support of the USA and G20, has brought some relief to an industry in crisis and brings to an end an aggressive price war between Saudi Arabia and Russia.

All participating countries agreed to adjust downwards their overall crude oil production by 9.7mn bpd versus their agreed baseline, starting on 1 May 2020, for an initial period of two months, concluding on 30 June 2020. From 1 July 2020 to 31 December 2020, the total adjustment agreed will be 7.7mn bpd. It will be followed by a 5.8mn bpd adjustment for a period of 16 months, from 1 January 2021 to 30 April 2022.

The baseline for the adjustments is the oil production of October 2018, except for Saudi Arabia and Russia, who will reduce output to 8.5mn bpd each, from an agreed common baseline of 11 mn bpd, or the highest level of Saudi production in the last two years.

However the oil price failed to rally significantly, trading at just under US\$30 as of 20 April, reflecting market sentiment that the cuts are insufficient to rebalance an oversupplied market.

“The historic decisions taken by OPEC+ and the G20 should help bring the oil industry back from the brink of an even more serious situation than it currently faces,” comments the International Energy Agency (IEA) in its latest monthly oil market report. “Even so, the implied stock build-up of 12 mn bpd in the first half of the year still threatens to overwhelm the logistics of the oil industry – ships, pipelines and storage tanks – in the coming weeks. We estimate that available capacity could be saturated in mid-year.”

The IEA warns that demand for fuel could drop to lows not seen since 1995 amid the COVID-19 pandemic. In April demand is set to fall by a record 29 million barrels per day as four billion people live under new emergency lockdown measures. Even if travel restrictions are eased in the second half of the year, demand for fuel is still expected to fall by more than nine million bpd, erasing almost a decade of demand growth, the IEA points out.

Bjornar Tonhaugen, head of oil markets at Rystad Energy, says, “It will take more courageous production cuts outside OPEC+ for the market to balance and prices to recover. The oil market will see enormous stock builds in April as the deal is only in effect from 1 May, while gradual shut-ins and production declines will already happen during the current month.

“We believe oil prices will see renewed downwards pressure. Further down the line, however, this deal may be bullish as OPEC+ plans to endure with the six million bpd cut through 2021, when oil demand most likely will have recovered back to normal and as supply capacity will have sustained lasting damage.”

“The persistence of a sizeable daily surplus during Q2 will see commercial oil stocks rising, with the rate of stock build accelerating if OPEC+ exhibits poor compliance levels,” comments Jadwa Investment. “If this transpires, oil prices will trend even lower, forcing a larger number of oil producers to make tough choices around shutting in wells, taking their oil off-line. Whilst a combination of permanent shut-ins and some recovery in demand later in 2020 could lend some support to oil prices, any upside would be limited due to the existence of large oil stocks.”

ADNOC terminates Petrofac contracts



OILFIELD SERVICES PROVIDER Petrofac has announced that its Petrofac Emirates joint venture has received notice of termination from Abu Dhabi National Oil Company (ADNOC) of two recently awarded contracts for the Dalma Gas Development Project.

Petrofac said it is committed to working with ADNOC over the coming weeks to explore alternative options to deliver this project in a way that supports their strategic objectives within the current challenging environment.

The project, worth around US\$1.65bn, and awarded in February 2020, comprised two packages. Petrofac Emirates’ portion of the scope of work is valued at US\$1.5bn.

Petrofac continues to progress execution of its remaining group backlog of around US\$7bn as planned, and is still progressing with tendering for major contracts in Abu Dhabi. However, it anticipates this development may have an impact on the timing of their awards.

Upstream expenditure set to fall sharply

THE INTERNATIONAL ENERGY Agency (IEA) in its April monthly oil market report forecasts that upstream spending will fall by 32 per cent year-on-year to US\$335bn. Previous guidance had indicated that global oil and gas upstream investment would be US\$490bn in 2020 (+1.5 per cent year-on-year), the Agency says.

“Savings are set to come from reduced activity levels, delays to the sanctioning of new projects and an even greater focus on cost control. However, the scope for the latter may be limited given that upstream costs are estimated to already be 25 per cent below 2014 levels,” the IEA says.

Rob Morris, from energy consultancy Wood Mackenzie’s upstream research team, forecasts that US\$110bn of investment will almost certainly be deferred, with another US\$100bn at risk.

“Only those with the strongest balance sheets will even contemplate major project FIDs. The Majors and certain NOCs will take the lead, while projects with financially stretched partners and those at the higher end of the cost curve will struggle,” he comments.

“Some project sanctions will be delayed to 2021 and beyond. Some will be completely reworked or even put on hold permanently. These include projects with weaker strategic drivers, high breakevens, and/or financially distressed operators. Project deferrals now will mean huge volumes of pre-FID production at risk from the mid-2020s.”

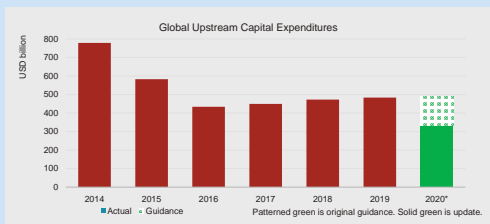


Image credit: IEA

Lamprell closes two UAE facilities

RIG CONSTRUCTION COMPANY Lamprell has mothballed its Jebel Ali facility and will close its Sharjah facility later this year following the completion of work on the Moray East project, the company has announced. It will continue to operate its Hamriyah yard, its largest facility, which offers opportunities for expansion if needed.

“Bidding activity continues in oil & gas and renewables, but we are seeing signs of deceleration and delays in some awards,” the company comments.

“These actions allow for the group to gradually grow fabrication volumes while improving efficiency and reducing the cost base.

“The measures translate into an approximately US\$23mn reduction in overheads for 2020.”

Licensing rounds set to be cancelled

MORE THAN HALF of the world's planned licensing rounds are likely to be cancelled this year due to the combined effect of the COVID-19 pandemic and the low oil price, a Rystad Energy impact analysis forecasts. New licensed offshore acreage is likely to fall by around 60 per cent, and onshore acreage by 30 per cent compared with 2019 levels.

This year was slated to be another remarkable year for exploration with around 45 countries launching at least 52 lease rounds, around 60 per cent of them in offshore areas.

"The unlikely upcoming lease rounds represent around 54 per cent – a worrisome sign for global exploration. A number of factors together make these rounds unlikely to go ahead, including the oil price drop, a global cut in investments by almost 20 per cent, a lack of skilled manpower due to the COVID-19 pandemic, fiscal regimes that are proving unattractive in the current environment, and a lack of interest among potential participating companies," says Rystad Energy's senior upstream analyst Aatisha Mahajan.

In the Middle East, Rystad predicts that rounds in the UAE may be put on ice, while Egypt's licensing rounds are marked as tentative.

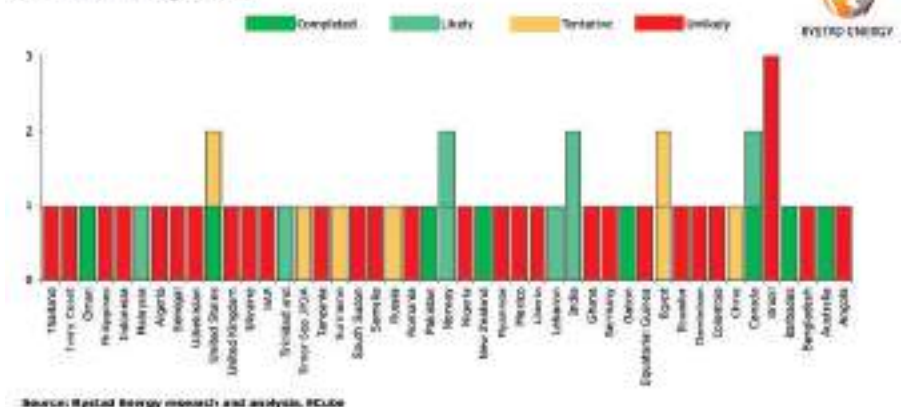
"Egypt is a very prospective region and has open-door licensing, under which we might witness the willingness to participate from companies with significant free cash flow," comments Rystad.

Lebanon's second licensing round is likely to go ahead, although it has delayed the deadline for bidding for the second time.

Oman is among the countries whose licensing rounds have already been completed this year.

"Our analysis indicates that global awarded acreage is likely to fall below 2015 levels this year,

Global lease round scenarios after oil-price crash per country for 2020
Number of licensing rounds



Source: Rystad Energy research and analysis, ECLiQ

while staying above the level seen in 2016. All will depend on global oil and gas companies' budgets and their appetite to take on new risk and exploration commitments in the current market environment," adds Mahajan.

As far as exploration is concerned, new volumes of around 2.5 billion boe have been discovered in the first quarter of 2020, down almost 40 per cent from the same period of 2019, and the number of discoveries has almost halved, says Rystad. The 22 discoveries are evenly split between onshore and offshore regions, with gas representing just over half of the volumes.

GlobalData's report, *'Impact of COVID-19 on Global Licensing Round Opportunities'*, states that throughout this period of uncertainty, licensing rounds are likely to be extended or deferred as governments prioritise managing the domestic impact of the virus or wait for investment conditions to improve. Toya Latham, Upstream

fiscal analyst at GlobalData comments, "The number of deepwater licenses awarded as part of bid rounds is also likely to be subdued in the short term. Deepwater projects often require more capital and have longer payback periods compared to onshore and shallow water projects, and therefore deepwater acreage is likely to be less attractive in the current investment climate."

Following the stabilisation of the oil price, there is likely to be a period of lag before the number of new awards secured through licensing rounds increases, adds GlobalData.

Latham continues, "Companies with less exposure to the oil price through limited or hedged production, which have available capital in the current environment, are likely to be well positioned for rounds held following the oil price stabilisation and may be in an advantageous situation to capitalise on reduced service costs for exploration activities."

Image credit: Rystad Energy

Majors donate high performance computing power to COVID-19 research

ITALY'S ENI HAS freely made its HPC5 supercomputing infrastructure and its molecular modelling skills available for Coronavirus research.

The collaboration is part of the European EXSCALATE4CoV project, led by the biopharmaceutical company Dompé, which brings together institutions and research centres in Italy and other European countries to identify the safest and most promising drugs in the fight against the Coronavirus.

Eni contributes to the project in partnership with Cineca, a non-profit research consortium. The joint team will carry out dynamic molecular simulations of viral proteins relevant to the COVID-19 strain, to identify the most effective pharmaceutical components among the 10,000 present in the databases. Afterwards, an activity will be carried out for the research of new specific anti-viral molecules through the screening of billions of structures.

Meanwhile, BP will donate its significant supercomputing capability and scientific expertise to the public-private consortium formed in March 2020 by the White House's Office of Science and Technology Policy, the U.S. Department of Energy and IBM.

The group, known as the COVID-19 High Performance Computing Consortium, will pool resources and expertise from Amazon Web



Image credit: Adobe Stock

Eni and BP are donating their supercomputing capabilities for COVID-19 research.

Services, Google Cloud, Microsoft, Hewlett Packard Enterprise, BP and others. They aim to provide COVID-19 researchers worldwide with access to the most powerful high-performance computing resources that can significantly advance the pace of scientific discovery in the fight to stop the virus.

STATS Group expands in Oman

PIPELINE SPECIALIST STATS Group has opened a workshop, storage and testing facility in Muscat.

The expansion comes after the pipeline technology specialist secured a two year extension to a master services agreement with Petroleum Development Oman (PDO) to provide pipeline isolation and hydrostatic testing services.

In the Middle East, STATS have trebled the size of their operation in Abu Dhabi in a move to a larger workshop and office facility in the Mussafah district.

STATS Group Middle East director, Angus Bowie, said, "The PDO master service agreement is an important contract and we are delighted it has been extended further. The new facility in Oman will help support this contract, and having a local presence gives us a platform to extend our footprint in the Sultanate and wider Middle East region."

"With our commitment in Oman and further investment in larger facilities in Abu Dhabi, it should open up new opportunities and underlines how much we value our existing clients in the region."

Last year, STATS signed an exclusive partnership agreement with Saudi Arabia's Safari Oil and Gas, and longer term plans to open a permanent base in Saudi Arabia.



Image Credit: STATS Group

Angus Bowie, Middle East director, STATS Group.

Oil and gas industry releases updated global sustainability reporting guidance

IPIECA, THE AMERICAN Petroleum Institute (API), and the International Association of Oil & Gas Producers (IOGP) have released the new edition of the sustainability reporting guidance for the oil and gas industry, which marks more than 15 years of collaboration between the member companies across the three leading industry associations.

"The fourth edition of the sustainability reporting guidance provides oil and gas companies with a clear framework to demonstrate their important role in the energy transition by reporting on how they manage climate and sustainability impacts and opportunities," said IPIECA's executive director Brian Sullivan.

"IPIECA encourages all oil and gas businesses across the industry to go beyond reporting on financial data and to also disclose their climate, environmental, social and sustainability activities."

Updates to the guidance have been applied to six areas of focus: reporting process; governance and business ethics; climate change and energy; environment; safety, health and security; and social impacts. Notably, modifications were made to improve reporting of performance indicators related to climate change and energy, as these areas are of real interest to an investment community increasingly committed to financing innovative, lower-carbon energy paths.

The updated guidance represents the work of more than 80 representatives from 28 oil and gas companies from six continents and an independent external stakeholder panel comprised of experts representing NGOs, investors and investor groups, banks and expert consultants.



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Amarinth supplies pumps for ADNOC storage facility

AMARINTH, WHICH SPECIALISES in the design, application and manufacture of centrifugal pumps and associated equipment, has supplied four API 610 VS4 pumps to ADNOC for the Al Mandous underground oil storage project.

ADNOC is building the world's largest underground oil storage facility in the Emirate of Fujairah, UAE which will consist of three underground storage caverns each with a capacity of 14mn bbl, deep below ground level.

Amarinth were selected following the company's successful delivery and continued support of pumps for previous demanding ADNOC projects. The four API 610 11th edition VS4 vertical pumps are 4m long transfer pumps and are supplied with Plan 53B seal support systems.

The pumps are manufactured in D2 super duplex stainless steel to ADNOC specification, which includes Shell DEP standards.



Image Credit: Amarinth

The API 610 VS4 pump and Plan 53B seal support system.

ProSep wins mixers contract

PROSEP, AN INDUSTRY leading provider of proprietary solutions for reduced chemical, water usage and clean water, has successfully secured a six-figure contract with a leading Middle East national oil company.

The contract, which is to provide four Annular Injection Mixers (AIM) for a gathering and separation plant, was signed earlier last month and will be completed and delivered by August this year.

An enhanced, compact version of ProSep's proprietary AIM mixer will be supplied to the client. This modification will enhance the mixing efficiency of wash water being injected upstream of the crude desalters in the desalting trains at low differential pressure.

The enhanced AIM and its innovative two cone design were created as an alternative to the

conventional injection "T" method for improved desalting performance for injection of both water and demulsifier chemical.

Raul Gonzalo, ProSep's Middle East sales and service manager said, "ProSep has been successfully delivering our proprietary technology for this Middle East-based client for more than 12 years and we are delighted to provide a bespoke solution, which was specifically designed to meet the client's particular requirements.

"Dehydration and desalting of crude oil is a critical stage of processing crude oil, and ProSep's first in class mixers are proven to enhance wash water injection efficiency during the dehydration process, reduce wash water injection volumes by 15-40 per cent, and improve oil-water separation when compared to traditional mixing technologies."

Phaze Ventures invests in seismic monitoring startup

PHAZE VENTURES, THE Oman-based venture capital firm, has announced its investment into SpotLight, the French geoscience startup that provides dynamic detection of subsurface movements. The deal marks Phaze Ventures' seventh investment since 2018.

SpotLight's proprietary single source, single receiver seismic monitoring technology is currently being piloted by Petroleum Development Oman. The first and only solution to offer 4D seismic monitoring of subsurface movements from a single source and a single receiver, SpotLight's technology drastically reduces the cost of effective real-time monitoring and unlocks the possibility of accurate monitoring for a much wider range of projects than ever before including, but not limited to, projects stretching across the oil and gas value chain and nuclear storage.

Habib Al Khatib, founder and CEO of SpotLight, said, "Over the last six months we have been working very closely with the team and Petroleum Development Oman to further develop and deploy our technology in-country. The results so far have been very exciting, and we look forward to continuing our rapid progress over the months and years to come."

Abdullah Al-Shaksy, CEO and co-founder of Phaze Ventures, added, "SpotLight's technology marks a tremendous step forward in the ability to monitor and prevent subsurface environmental impact in a non-invasive and cost-effective manner."

Lebanon extends offshore licensing round

THE LEBANESE PETROLEUM Administration (LPA) has announced a postponement of the closing date for its second offshore exploration licensing round, in response to the spread of COVID-19 worldwide.

The deadline for the submission of the Licensing Round Applications was initially set to 31 January 2020, but was later postponed to 30 April 2020. The new deadline is 1 June 2020.

Lebanon's Council of Ministers approved the launch of the second offshore licensing round in April 2019. Five offshore blocks are to be offered in the second round – blocks one, two, five, eight and 10.

Prospects offshore Lebanon are promising given known hydrocarbon systems and recent discoveries in the vicinity. Following the prominent Zohr discovery offshore Egypt, much of the eastern Mediterranean has seen a renewed focus of exploration activity. The Lebanese government estimates that the offshore oil and gas frontier areas in the eastern Mediterranean may hold around 25 tcf of natural gas reserves.

In February 2018, Lebanon signed its first offshore oil and gas exploration and production contracts for two energy blocks with a consortium of Total, Eni and Novatek. This February, Total anchored a drilling vessel off the coast of Lebanon, set to drill the first exploration well in the country's waters in Block 4.



Five offshore blocks are being offered in the second licensing round.

Image Credit: Lebanese Petroleum Administration

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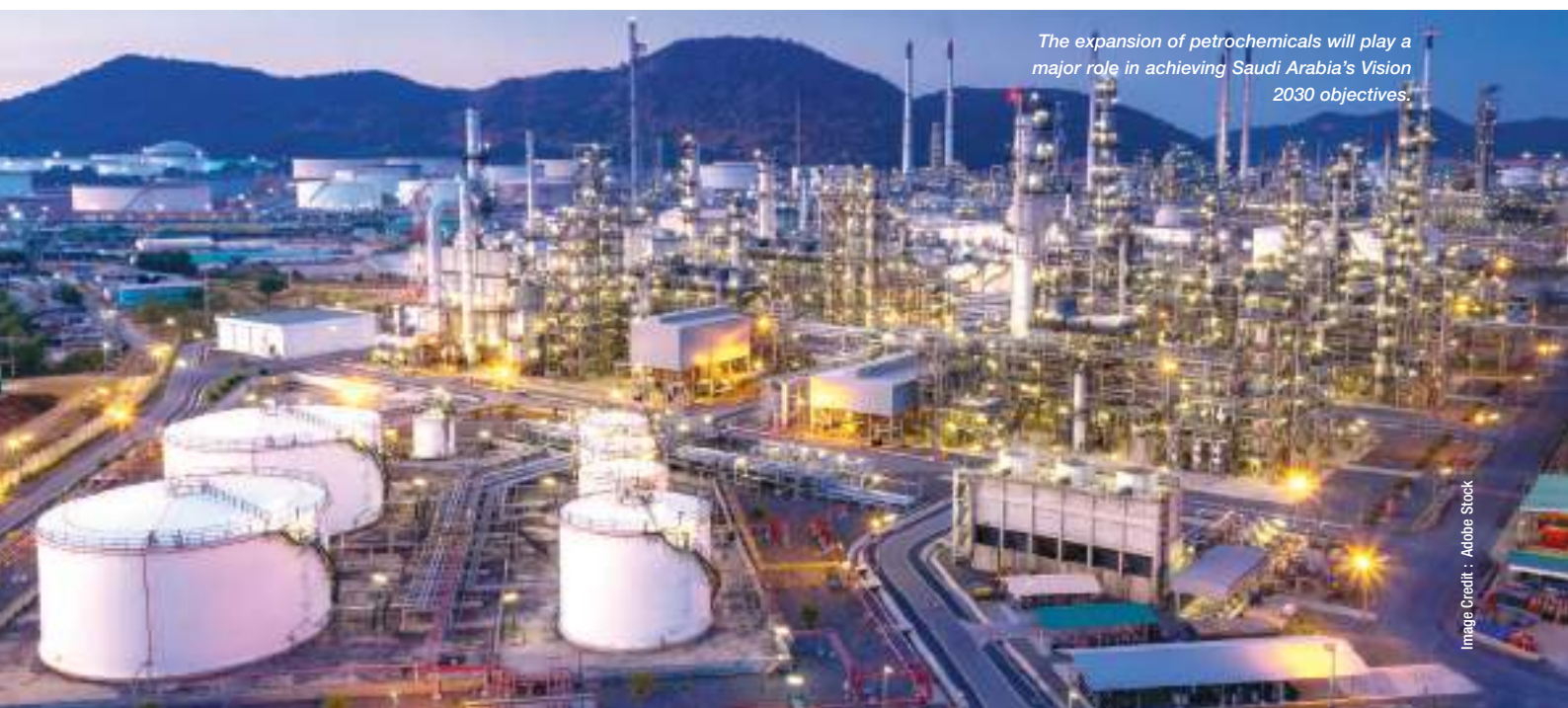
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The Exhibition of the SABIC Conference 2020 was held from 17-20 February at the King Abdullah Cultural Center, Jubail, Saudi Arabia.



The expansion of petrochemicals will play a major role in achieving Saudi Arabia's Vision 2030 objectives.

Image Credit : Adobe Stock

BUILDING ON ITS reputation as a platform for collaborative technology and innovation, the event provided a forum for debating key issues, developments and technologies in the global petrochemical industry, as well as opportunities to network and establish partnerships with petrochemical operators, clients and investors.

The theme of the SABIC Conference 2020 was Chemistry 4.0, where digitalisation, the circular economy, sustainability and innovation were the key features. An impressive line-up of global and local CEOs, heads of manufacturing companies, scientists, researchers, chemists, engineers and technical experts shared their experiences and expertise. The accompanying Exhibition of the SABIC Conference 2020 brought together SABIC vendors and suppliers as well

“ It was a successful event with many insights, and great connections were made.”

as companies looking to establish business partnerships with SABIC and the major participating companies. It attracted around 35,000 visitors and featured more than 600 exhibiting companies from 59 countries, across sectors ranging from petroleum, mineral resources and chemicals, to agriculture and water, industrial equipment, ICT, environment protection, materials handling, and robotics and automation.

Speaking at the inauguration of the conference, Saudi Arabia's Energy Minister Prince Abdul Aziz bin Salman bin Abdulaziz Al Saud highlighted Saudi Arabia's key role in the global petrochemicals industry, and the importance of the integration of the oil and petrochemical industries to increase the production of specialised materials to support manufacturing industries – the rationale behind Saudi Aramco's acquisition of a majority stake in SABIC.

The Minister also stressed the importance of the circular carbon economy model to achieve sustainability goals, allowing carbon emissions to be reduced, reused, recycled and removed. He highlighted the Energy Ministry's role in pioneering all sources of energy and creating an integrated system for the energy sector to support the Kingdom's Vision 2030 objectives. ■



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Craig Smith, AspenTech managing director – KSA & Bahrain

“ASPENTECH WAS PROUD to be a gold sponsor and content contributor of the SABIC Conference & Exhibition 2020, the largest petrochemical exhibition in the Middle East. With the Kingdom of Saudi Arabia being one of our key growth areas, our focus there was to share Aspen Technology expertise on asset optimisation and digitalisation and to strengthen our technology partnership with SABIC.

“The SABIC Conference and Exhibition demonstrated the importance of the Saudi Arabian petrochemicals market – more specifically, the people in the petrochemical business. It was an honour to meet SABIC executives and users. AspenTech was invited to be part of the opening ceremony and had an incredible opportunity to hear the Kingdom’s leadership vision of the petrochemical industry’s future in Saudi Arabia.

“I can’t stress enough the importance of our participation at this event, which included meeting executives at the decision-making level on the exhibition platform to share our solutions and services to the new group of potential and existing customers.

“We were also proud to support the AIChE’s Young Professionals Committee (YPC), which is supported by SABIC during the Conference. It’s always a pleasure to see engagement of young engineers to show them the opportunities available for them in the future and to mentor them with latest technology insights and trends.

“AspenTech software tackles the most complex process manufacturing challenges, creating value and improving profitability for our customers. With integrated aspenONE software, our customers can better design, operate and maintain their complex manufacturing environments.

“Saudi Arabia is at the inflection point of massive economic development, which means tremendous growth potential in all sectors. The oil and gas industry is a mature market, but new digital transformation initiatives are driving new goals for optimisation and efficiency levels. Next-gen energy production, diversification into oil-to-chemicals and the petrochemical markets, manufacturing and pharma development will all drive the next 20 years of growth opportunities in KSA – and the possibilities for AspenTech to be a key contributor in all these sectors is unlimited. A new understanding of the importance of systems engineering and integrated solutions makes this a very exciting chapter in the long history of Arabian energy development.

“Those of us embedded within AspenTech Saudi Arabia believe there is a substantial additional value that AspenTech solutions will bring to our customers’ digitalisation journey, sustainability issues of resource and energy efficiency, innovation and human capital development across industry sectors. We are positioned as a key contributor to Kingdom’s Vision 2030 initiatives and will continue to expand on opportunities at the



Image Credit : AspenTech

Craig Smith, AspenTech managing director, KSA and Bahrain.

local, regional and national level with industry leaders, government ministries and the academic sector. AspenTech is a proud contributor to programmes such as SABIC’s university hire programme, working closely with their team to ensure future leaders are more prepared than ever to tackle the challenges of tomorrow.”

Zaher Ibrahim, VP Saudi Arabia & North Gulf, Baker Hughes

“BAKER HUGHES PARTICIPATED in the SABIC Conference & Exhibition (SABIC 2020) as a gold sponsor and exhibitor. Our focus was to connect with our customers and industry professionals to share knowledge, experiences and achievements within the downstream industry.

“It was a successful event with many insights, and great connections were made. As it was the first time Baker Hughes participated, we were able to share our new brand with our key stakeholders and show how Baker Hughes’ fullstream technology portfolio, the only one within the industry, is enabled by our people and scale, to boost productivity and improve outcomes for ourselves and our customers.

“We have more than 80 years of presence and partnerships in Saudi Arabia, and we continue to build on our presence as an energy technology company adding value to our partners. We’re contributing to the Saudi Vision 2030 through technology development, talent upskilling and localisation of our operations to strengthen our footprint and customised solutions to address customer and industry challenges.

“For example, we recently signed an agreement with Saudi Aramco to establish a non-metallic joint venture in the country. This venture not only supports Saudi Aramco’s strategy in accelerating the deployment of non-metallic materials globally, but also supports the country’s goal to diversify the economy by developing such capabilities in Saudi Arabia.

“Non-metallic materials will help reduce emissions and contribute to the efficiency and reliability of operational assets by reducing the effects of corrosion. More importantly, it has the potential to be utilised and deployed in various industries, including oil and gas, construction, automotive, packaging and renewable energy, to manufacture various products.

“Baker Hughes has positioned its credentials as an energy technology company with proven expertise to bring cleaner, safer and more efficient energy. The future of Baker Hughes in Saudi Arabia will focus on additive manufacturing as a fundamental tool for the industry, deployment of low-carbon technology, and further localisation. Combining these key goals will



Image Credit : Baker Hughes

Zaher Ibrahim, VP Saudi Arabia & North Gulf, Baker Hughes.

strengthen our operations, talent, and our products and services; unlocking the power of engineering, science, and data to redefine what’s possible.”



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Weathering the COVID-19 storm

With low production costs, robust business continuity plans and a strong financial position, Saudi Aramco is relatively well placed to cope with the COVID-19 headwinds.

IT WAS ONLY last September that Saudi Aramco's resilience was severely tested with drone attacks on two of its major facilities. The company was able to restore production levels within 11 days and meet its delivery obligations due to its emergency response training and procedures, commitment of its people and an agile in-Kingdom and global trading function. This resilience will stand Saudi Aramco in good stead in seeing it through the COVID-19 crisis.

It is the health and safety of its people, communities and operations that is driving Saudi Aramco's response as it confronts the global spread of COVID-19, the company's CEO Amin H. Nasser stressed in a message to its employees.

The world's largest integrated oil and gas company is sparing no effort to ensure it has a safe working environment, with extensive disinfection efforts and health protocols being reinforced and continually tested. The company has on-going prevention programmes as well as detailed contingency plans and leading medical support services, to minimise risk, provide the best possible care and limit contagion. For example, at entrances to all offices and sites, personnel are scanned by an infra-red thermal scanner, and on drilling rigs, a rig medic takes and records the temperature of employees and contractors on the site twice a day, as well as checking for symptoms. While a medically-equipped vessel is on stand-by to transport workers from offshore rigs suspected of suffering from the virus.

Other measures include the establishment of an executive COVID-19 task force and safety campaigns targeted at employees and the community, as well as a dedicated advice hotline.

Training programmes and meetings take place online, and while increasing numbers of eligible employees are working from home, in line with government instructions, measures to ensure social distancing have been implemented for front-line employees and contractors. Riyadh Bulk Plant, for example, has implemented safe distancing and stringent guidelines for 4,000 drivers who come through the plants in trucks.

Well-stocked, digitised inventories and strategic relationships with key manufacturers have enhanced the resilience of the company's supply chain, resulting in minimal disruption to operations. While dashboards continually track the availability of employees as well as personnel and equipment across service companies, ensuring business continuity.

In common with most other operators globally, the company is making capex cuts in response to "current market conditions and recent commodity price volatility", with capital spending for 2020 expected to be between US\$25-30bn, compared to US\$32.8bn in 2019 and US\$35.1bn in 2018.

"The company's low upstream costs and low sustaining capital provide significant flexibility and demonstrate differentiation to its peers," Saudi Aramco commented in a statement.

The International Energy Agency (IEA) notes in its April oil market report that Saudi Arabia has foreign exchange reserves of around US\$500bn to draw on to address budget shortfalls. Production costs



Image Credit : Saudi Aramco

are the lowest in the industry; 2019 lifting costs were US\$2.8/boe and capex was US\$4.7/boe.

From 1 May Saudi Aramco will pump 8.5 mn bpd of crude as per the OPEC/non-OPEC deal. The Kingdom had targeted maximum capacity of 12 mn bpd in early April after the earlier OPEC+ deal expired, with the first weeks of April seeing record export volumes of around 10mn bpd, the IEA reports. Much of this extra volume was originally destined for the Atlantic Basin.

"However, it has grown more challenging for producers to place their additional barrels as demand plunges and freight rates soar," says the IEA. Saudi Aramco has made big cuts to its official selling prices to Asia, to remain competitively priced in its major market which has seen significant refinery run cuts due to the coronavirus.

The company continues to pursue its strategic goal to become the world's foremost integrated energy and chemicals company. "We maintain our commitment to investment in the future," said Nasser in the Foreword to the company's Annual Report for 2019.

Upstream expansion

Saudi Aramco is looking to boost its maximum sustainable capacity to 13mn bpd from the current level of around 12 mn bpd, the first increase in more than a decade, as instructed by the Ministry of Energy.

"The state enterprise will need to increase its investment in refurbishing and revamping its brownfield offshore and onshore assets to be able to raise its output capacity by one million bpd in the near term," comments Indrajit Sen, Oil & Gas editor at GlobalData.

"Sustaining the output capacity in the mid-to-long-term will also increase the necessary routine spending on infrastructure such as central processing facilities (CPFs), gas oil separation plants (GOSPs), and oil and gas processing plants.

"Aramco will need to maintain, if not potentially raise, its capital

expenditure if it seriously intends to meet its targets.”

Sen suggests that with global demand for refined fuels and petrochemical products plunging, an alternative budgetary route in the short term could be to cut its expenditure on downstream projects.

The IEA suggests, “The capacity boost, which could cost at least US\$20bn, may focus on ramping up output from offshore fields such as Berri, Zuluf and Marjan.”

Certainly a major focus of Aramco’s upstream activities is the major expansion of oil and gas production at the Marjan and Berri offshore oilfields, with the aim to boost the fields’ production capacity by 550,000 bpd of crude and 2.5bn scf of gas.

In July 2019 Saudi Aramco awarded 34 contracts with total value of US\$18bn for the engineering, procurement and construction of the Marjan and Berri increment programmes, to companies including McDermott, Saipem and L&T Hydrocarbon Engineering (LT&E). The Marjan expansion was by far the largest offshore hydrocarbons project approved globally in 2019, according to Rystad Energy, with close to US\$12bn in investments.

“These investments will support our continued focus on employing best-in-class technologies, well completion and reservoir management practices,” said Nasser at the time, adding that it would also enable Saudi Aramco to further reduce the carbon intensity of its crude oil.

The development programme for Marjan includes a new offshore gas oil separation plant and 24 offshore oil, gas and water injection platforms. The company also plans to expand its Tanajib onshore oil facilities and construct a new gas plant, to include gas treatment and processing, NGL recovery and fractionation, and gas compression facilities. A cogeneration facility will be developed, in addition to a water

desalination facility and new transfer pipelines.

The Berri increment programme will include a new water injection facility, two drilling islands, 11 oil and water offshore platforms and nine onshore oil production and water supply drill sites.

Somayeh Davodi, oil and gas analyst at GlobalData commented, “The major expansions at Saudi Aramco’s offshore oilfields of Marjan, Zuluf, Safaniyah and Berri are expected to comprise the majority of the company’s upstream investment over the next three years. Although these developments will also add gas and NGL capacity, the main addition will be oil.”

The gas sector has however been given a major boost with the regulatory approval in February 2020 of the development of the Jafurah unconventional gas field, the largest non-associated gas field in Saudi Arabia, with estimated resources of 200 trillion cubic feet of gas. This will provide valuable feedstock for the petrochemical industries and boost the company’s ambitions to become a major global gas player and exporter.

The field will be developed in phases, with production to commence in early 2024. Output is expected to reach around 2.2 bn scfd of sales gas by 2036, with an associated approximately 425mn scfd ethane, representing around 40 per cent of current production. The field is also expected to produce approximately 550,000 bpd of gas liquids and condensates.

The Fadhili gas processing facility is on track to deliver an additional 2.5 bscf/d of gas processing capacity on completion this year, according to Saudi Aramco.

The company is also conducting an investment feasibility study in the Red Sea after discovering large quantities of gas. ■

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The oil industry and COVID-19

The oil and gas industry has been severely impacted by the COVID-19 pandemic.

While the oil and gas industry has suffered immeasurably from the impact of COVID-19, it is well placed to weather the storm, says Boris Ivanov, founder and managing director of GPB Global Resources B.V.

AS CORONAVIRUS LOCKDOWNS continue to spread around the world, the oil industry faces more disruption to demand and supply chains, with many prices and margins already collapsing.

With travel and broader economic activity across the world restricted, demand for transport fossil fuels has dropped. This reduction in demand is particularly notable in China, the world's largest energy consumer, which last year accounted for more than 80 per cent of global oil demand. Electricity demand and industrial output in the country has been functioning at levels far below their usual rate, with coal consumption at power plants down 36 per cent and the country's oil refining capacity reduced by 34 per cent.

For the oil market, the consequence of this reduced demand has been particularly marked, resulting in a twofold challenge, a drop in oil's value and a consequential price war.

The biggest issue for the industry came in early March when the Organization of the Petroleum Exporting Countries (OPEC) and ten other oil producing countries failed to come to an agreement on stable production levels. With Russia unwilling to accept a

production cut of more than one million barrels per day (bpd) to offset falling demand, oil prices plunged to a multiyear low. By mid-March, crude prices were down to 30 per cent, sparking a selloff in crude oil.

With the short-term situation proving fluid as governments around the world initiate several control measures, there is still a great deal of uncertainty regarding what the full impact of the virus might be for the oil industry, and how things will develop.

What is certain however is that the oil industry has survived many periods of hardship including the 2008 financial crash, and will survive this latest 'Black Swan' event.

“Producers and supply chains have had to adapt.”

Many in the industry are confident in their ability to weather market volatility as they had done in previous low-price storms in 2008 and 2016. However, producers and supply chains have had to adapt.

In response to strained demand, some oil producing countries like Saudi Arabia, Iraq and Nigeria have opted to sell crude oil at discounted rates, and several oil companies are scaling down on their exploration, production and new projects budget. Oil majors like Royal Dutch Shell and Chevron are taking immediate steps to ensure they are well-positioned for the eventual economic recovery and are significantly reducing their capital spending plan and suspending share repurchases to prioritise long term value and protect dividends.

Goldman Sachs said in a research note published on 30 March, that global oil demand has fallen 25 per cent in the wake of the Coronavirus. They added that “Not only is this the largest economic shock of our lifetimes, but carbon-based industries like oil sit in the cross-hairs as they have historically served as the cornerstone of social interactions and globalisation, the prevention of which are the main defence against the virus”.

It is clear now that the crisis has revealed certain truths about international cooperation, governance, and the energy system.

Companies and oil industry bodies are calling for governments across the world to

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China's economy could rebound significantly once the outbreak is controlled.

put measures in place to support their respective oil industries. In the USA, there has already been a focus on mobilising stimulus funding to purchase crude oil for the Strategic Petroleum Reserve to help prop up the country's oil and gas producers. Likewise, industry trade unions in the UK met with Scotland's energy minister to discuss future proof plans for the industry's skilled workers operating in the North Sea. Such initiatives should help protect the industry and safeguard its workers during this period of uncertainty.

“ The priority is to put the health and safety of their staff and customers first and ensure the safety of their business operations.”

With Saudi Arabia pumping record levels of crude in April, which could lead to further price drops for global oil markets as demand for energy continues to fall, countries must work together on proposed market solutions. Energy cooperation has been a solid pillar of the transatlantic cooperation in the toughest of times. Therefore, the importance of maintaining this cannot be over-stated.

The historic OPEC/non-OPEC agreement to cut production, reached in mid-April with the support of the USA, sends a positive signal, and marks the end of the Saudi Arabia/Russia price war. However with the deal not due to take effect until the beginning of May, stocks continue to build and the market remains oversupplied.

In the longer term, many are looking towards the likely resurgence of oil demand in 2021. Once the outbreak is controlled, the global economy, particularly China and India, is expected to rebound at a notable rate. As a result, global oil demand could double or triple to make up for the lost demand.

The oil industry is resilient and well positioned to withstand this challenging environment and weather market volatility. For oil companies, the priority is to put the health and safety of their staff and customers first and ensure the safety of their business operations.

While it is simply too early to tell the energy outlook for the future as a result of the COVID-19 impact, the world will move beyond this, and the business case for streamlining operations and investing in resilience planning will be reinforced and widely accepted. ■

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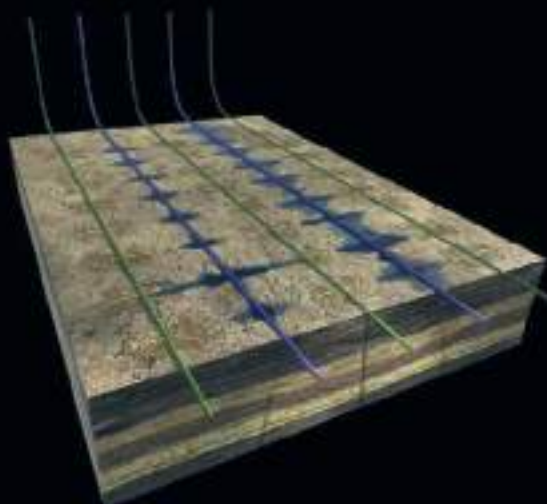


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Slowing the investment wave

Chemical and oil companies are slashing capex, says Joseph Chang, global editor, ICIS Chemical Business, with additional reporting by Stefan Baumgarten, ICIS.

IN THE WAKE of the coronavirus and collapse in crude oil prices, chemical, oil and gas and midstream companies will all slash capital spending (capex) for growth projects to preserve cash. As a result, the global chemical investment wave looks to slow considerably in the years ahead.

While major US chemical projects under construction should continue, the fall in Brent crude oil prices and the shrinking of the Brent/US Henry Hub natural gas ratio from the 30s to the mid-teens “puts into question the economics long term,” said Kevin Swift, chief economist of the American Chemistry Council (ACC), speaking in an ICIS webinar on the economic outlook.

“Saudi Aramco has the most ambitious petrochemical expansion plans of any company.”

“This creates an awful lot of uncertainty, and decision-makers don’t like uncertainty,” he added.

This year, US-based Dow had already taken down its capex plan to US\$1.5bn for 2020 from US\$2bn in 2019. However, in an appearance on CNBC’s Mad Money programme with Jim Cramer, CEO Jim Fitterling said the company would struggle to meet even the lowered US\$1.5bn capex target because of limitations on the movement of contractors and engineers given the coronavirus outbreak.

In March, Shell announced the temporary suspension of work on its 1.5m tonne/year cracker under construction in Monaca, Pennsylvania to prevent the spread of the coronavirus. No timeframe was given for when work would resume.

For Dow, after having paid down around US\$2bn in debt in 2019, it

would like to pay off another US\$500m-US\$1bn in debt in 2020, said Fitterling. At the end of 2019, Dow had net debt of US\$14.6bn.

Dow is in the process of starting up its Texas-9 cracker expansion adding 500,000 tonnes/year of ethylene capacity in Freeport by mid-Q2. Among other project plans are a 130,000 tonne/year ethylene expansion in Western Canada by H1 2021 and a 600,000 tonne/year polyethylene (PE) plant on the US Gulf Coast for an H2 2022 start-up.

Canada-based Methanex said it is evaluating all capital and operating spending, including its planned Geismar 3 project in Louisiana which would add 1.8m tonnes/year of methanol capacity.

Oil companies to pull back

Major oil companies will also cut capex plans for 2020 and beyond in response to the collapse in oil prices. Importantly, many of these companies had aggressive plans for petrochemical capacity expansion, as they shifted their focus away from transportation fuel and towards chemicals for future growth.

While oil companies have not yet specifically mentioned cuts to chemical projects, all investments should see an impact.

Saudi Aramco, the world’s largest oil producer, is slashing 2020 capex from an expected US\$35-40bn range indicated in its IPO prospectus, to a level of US\$25-30bn. This is also down from capex of US\$33bn in 2019. Aramco’s capex plans for 2021 and beyond are also under review.

“As yet, no one knows precisely the impact on economic activity and energy demand from the coronavirus outbreak, especially in the longer term, and additional efficiencies may be required,” said Aramco chief financial officer Khalid al-Dabbagh, on the company’s Q4 earnings conference call.

Saudi Aramco has the most ambitious petrochemical expansion plans of any company, with multiple new cracker and derivative projects in Saudi Arabia, China, India and the USA. It had planned to spend around US\$100bn towards petrochemical expansions over a decade.

US-based ExxonMobil said it is considering significant cuts to capex and operating expenses. The company is building a 1.8m tonne/year joint venture cracker complex with SABIC in Corpus Christi, Texas with a planned start-up in H1 2022, and is planning a cracker complex in China as well.

Other oil companies have also announced capex cuts, and more will surely follow.

Midstream capex cuts

North American midstream energy companies are also busy taking down capex plans.

Canada-based midstream energy and petrochemicals company Pembina Pipeline is chopping 2020 capital spending by between Canadian dollar (C\$) 900m to 1.1bn (US\$625-764mn) to a level of C\$1.2-1.4bn.

A number of projects will be deferred, including Pembina's investment in the Canada Kuwait Petrochemical Corp (CKPC) petrochemicals joint venture – which involves building an integrated propane dehydrogenation and polypropylene (PDH/PP) complex in Alberta.

A number of other midstream energy companies have announced plans to cut capex.

Major cuts to capex plans for oil and gas, and midstream energy companies are a long-term problem for the US petrochemical industry, as access to abundant and low-cost natural gas liquids (NGL) feedstocks is its lifeblood.

The US shale gas cost advantage has spurred hundreds of billions of dollars in chemical investment. With the crash in crude oil prices, which has severely diminished this advantage, the investment boom is clearly under threat.

"We could see delays in decisions on projects that were going to start up in 2025. Companies can certainly afford to delay a decision by a quarter or two," said the ACC's Swift.

Company	Capex 2020 original	Capex 2020 revised	% change
Shell	US\$25bn	US\$20bn or less	-20%
Chevron	US\$20bn	US\$16bn	-20%
Total	US\$18bn	Less than US15bn	-20%
Saudi Aramco	US\$35-40bn	US25-30bn	-27%
Eastman	US450-475mn	US\$325-375mn	-24%
Methanex	US550mn	US325mn*	-41%
Trinseo	US\$100mn	US80-85mn	-18%
Targa Resources	US1.2-1.3bn	US\$800-900mn	-32%
Pembina Pipeline	C\$2.3bn	C\$1.2-1.4bn	-43%

**ICIS estimate based on company guidance, statements*

“ We could see delays in decisions on projects that were going to start up in 2025.”

Planned US cracker projects for start-up further down the road in 2023-2025 where final investment decisions (FIDs) have yet to be made include those by FG LA LLC (Formosa), PTTGC/Daelim, Chevron Phillips Chemical/Qatar Petroleum, and Motiva (Saudi Aramco). ■

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GP Global's new operation at Jebel Ali complements its existing one at the Port of Fujairah.

Expanding bunkering operations

Image Credit - Adobe Stock

Anil Keswani, GP Global's head of Bunkering, East of Suez, discusses the company's new operation at Jebel Ali and trends affecting the bunkering market.

What was the rationale behind the establishment of your new operation at Jebel Ali?

Our new operation in Jebel Ali represents a strategic expansion in the supply of marine fuels for our bunkering business. Jebel Ali is the Middle East's largest container handling port as well as one of the top 10 container ports of the world. The Jebel Ali Port plays a significant role in serving the Gulf, Indian subcontinent and African Markets. The port is strengthened with one of the highest degrees of specialisation in storage and handling of all kinds of cargo at its facility and is a premier gateway connecting more than 150 ports worldwide.

We see this destination as a vital link in the global trade network that provides us with effortless connectivity to South Asia, North America and the Middle East. Further, we are proud to be contributing to DP World's efforts in playing a pivotal role in the development of the UAE economy.

Starting our operations with two of our owned bunker barges, with a capacity of 4,800 MTs of fuel oil and 1,000 MTs of gas oil for each, the new operation complements our strong operations in the Port of Fujairah. With our proven strengths in bunkering, the new operation in Jebel Ali will further catalyse our overall bunkering business.

What has been the impact of IMO2020 on your operations?

In Q4 2019, our facility in the Port of Fujairah, the second biggest bunkering hub globally, started providing for and storing low sulphur fuel oil, even before the regulation came into effect. Tanks were adapted and converted, and we have our own barges to ensure steady supply. Our new Jebel Ali bunkering operation complements this initiative as we had set up a group milestone by completing our first delivery of IMO compliant fuel oil, three months ahead of the January 2020 deadline.

“ We see this destination as a vital link in the global trade network.”

Owing to different fuel blends, the compositions and properties of low sulphur fuel in the market vary widely. Hence, we have established our own loading, delivery and handling procedures as well, to mitigate the risk of quality issues. With IMO 2020 regulations seeing the largest reduction in the sulphur content of a transportation fuel

undertaken at one time, GP Global is committed to continue to champion the bunkering industry's needs for low sulphur fuels, working closely with customers and partners on cleaner energy solutions.

Are you seeing a trend to more environment friendly and sustainable fuels generally?

Fuel oil contains sulphur which, following combustion in the engine, ends up in ship emissions. Sulphur oxides are known to be harmful to human health, causing respiratory symptoms and lung disease. In the atmosphere, SOx can lead to acid rain, which can harm crops, forests and aquatic species, and contributes to the acidification of the oceans. Limiting sulphur oxides emissions from ships will improve air quality and protect the environment.

Amid the global effort to shift industries towards more environmentally friendly and sustainable outputs, I believe the oil & gas and shipping industries will play an important role in managing production safety to reduce emissions and have an ecological impact, while providing energy at a reasonable cost. Because of this, the use of fossil fuels will continue to be considered an important raw material in the production of oil and gas products.

Following the launch of the IMO 2020 regulations on 1 January 2020, sulphur oxides emissions are expected to drop by 77 per cent and an annual reduction of approximately 8.5 million metric tonnes, resulting in major environmental benefits for the world, particularly for populations living close to ports and coasts.

In addition to this, I believe we will see a future in which LNG, biofuels and methanol will be considered IMO 2020 compliant fuels.

“We are operating within a volatile global market, with ongoing shifts of demand and supply.”

How does GP Global promote safe, secure and efficient operations at its terminals?

At GP Global, we hold ourselves to the highest standards of conduct by acting in accordance with all regulations within the



Anil Keswani, GP Global's head of Bunkering East of Suez.

jurisdictions we operate. This is by no means limited to the important safety and security measures in our bunkering operations.

We have a long and strong track record in bunkering, and we know that it is a critical operation that involves safety and environment hazards. Hence the movement,

transfer, storage and handling of bunker are always undertaken with the utmost professional care and caution.

The construction, operations, equipment, procedures, personnel and practices of our terminals are in full compliance and carried out in strict accordance with all the requirements laid down in the relevant regulations and laws, while meeting the needs and expectations of our customers.

Are there any other trends you are seeing that are affecting your bunkering activities?

We are operating within a volatile global market, with ongoing shifts of demand and supply. In addition to this underlying trend of volatility, optimum utilisation of existing infrastructure, its current configuration, segregation and quality control are key parameters which are affecting bunkering activities.

We know that the bunker fuel market is expected to grow at a CAGR of more than 4.5 per cent during the forecast period of 2020-2025. Given the current market trends, we are committed to being responsive in our approach, ensuring that our services are efficient and meet the varied needs of each and every customer. ■

Total charters its first LNG-powered Very Large Crude Carriers

Total has signed a pioneering agreement to charter its first two LNG-powered VLCCs (Very Large Crude Carrier). The two vessels, which are able to carry around 300,000 tons of crude oil each, will be delivered in 2022 and will join the time-chartered fleet of Total. These VLCCs will be chartered to Malaysian shipowner AET. The vessels have been designed with LNG propulsion to benefit from reduced Greenhouse Gas emissions and with the latest technologies to further lower their consumption.

“LNG is the best and immediately available solution to reduce the environmental footprint of shipping,” highlights Luc Gillet, senior vice-president Shipping at Total. “The use of LNG to fuel our chartered vessels is the illustration of our determination to reduce the carbon footprint of our activities. With this decision, we reaffirm today our positive contribution to a sustainable shipping industry and our commitment to extend the use of LNG as a clean marine fuel.”

The supply of LNG for these two LNG-powered VLCCs will be provided by Total Marine Fuels Global Solutions, Total's dedicated business unit in charge of worldwide bunkering activities.

Compared to ships currently powered by fuel oil, the use of LNG results in a reduction of 99 per cent of sulphur oxide emissions; 99 per cent of fine particles emissions; up to 85 per cent of nitrogen oxide emissions; and around 20 per cent of greenhouse gases emissions.

Total is the second-largest private global LNG player, with an overall portfolio of around 50 Mt/y by 2025 and a worldwide market share of 10 per cent. With over 34 Mt of LNG managed in 2019, the Group has solid and diversified positions across the LNG value chain. Through its stakes in liquefaction plants located in Qatar, Nigeria, Russia, Norway, Oman, Egypt, the UAE, the USA, Australia and Angola, the Group sells LNG in all markets.

COVID-19 outbreak leads to a surge in tanker rates

THE RATES FOR chartering very large crude carriers (VLCCs) has surged exponentially due to a spike in demand for long-term offshore storage of crude oil following the OPEC's disagreement with Russia over the impact of the coronavirus (COVID-19) and the resulting oil price crash, according to leading data and analytics company GlobalData.

GlobalData's report, 'How Oil Tanker Rates Moved since the COVID-19 Outbreak' reveals that tanker rates initially declined in February 2020, amid subdued demand for crude oil and petroleum products following the outbreak of COVID-19. However, following the spat between Russia and Saudi Arabia, the latter announced an aim to lift its crude output by over two million bpd from 1 April 2020.

Ravindra Puranik, Oil & Gas Analyst at GlobalData comments, “The prospect of excess crude supply, at a time when global crude demand is already slowed, led to around a 30 per cent crash in oil prices in mid-March. As a result, oil producers and traders started leasing VLCCs to store low-cost crude oil, creating a contango situation.

“This situation was aggravated further after Bahri, the national shipping carrier of Saudi Arabia, chartered 19 VLCCs from the spot market. On 12 March, the VLCC rates from Persian Gulf to China route surged up to US\$175,000 per day from an average of US\$22,500 per day on 3 February.”

Following the exponential rise in during the week ended 13 March, tanker rates began reducing somewhat. As of March 20, 2020, freight rates from the Persian Gulf to the US Gulf came down to WS120 levels, while the China route observed a decline to WS130 levels. This decline is primarily due to a weekly fall in demand for tankers, as companies were unwilling to charter tankers at such high rates.

Puranik adds that if production cuts are adopted, oil prices may improve. (The OPEC/non-OPEC deal has since been reached). “This might prompt oil producers and traders to reconsider their plans for leasing tankers for longer term, thereby easing their rates along the key routes.”

A holistic approach to wellsite management

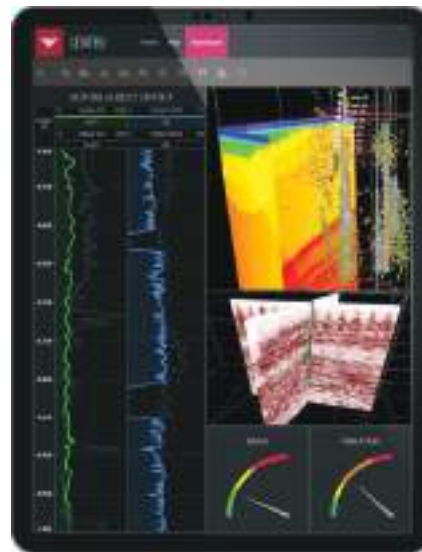


Image Credit : Weatherford

Julio Loreto, VP Drilling Services, Weatherford, spoke to *Oil Review Middle East* about the company's new digital wellsite management technology.

IN EARLY MARCH, Weatherford introduced Centro, a holistic approach to effectively managing complex wellsite operations digitally, combining data management, visualisation and real-time engineering technologies.

By seamlessly integrating every element of an operator's well data, team members from any global location can access, share, and store all vital project information at any time. Centro makes consolidated data available in real time, enabling advanced domain viewing and live analytics.

Discussing the rationale behind the creation of Centro, Loreto, who has been involved in the oil and gas industry since 1994, explained,

"Having been involved in drilling oil and gas

“What we lack is the integration and timely use of that data in our day-to-day operations.”

for several years, it is clear that we have more than enough data, from many different sources. You have real time information, historical data, seismic, and so on.

"What we lack, however, is the integration, the timely use of that data in our day-to-day operations, to improve operations, to bring the efficiencies that are needed and to increase production. One of the major drivers

for Centro as we positioned the solution, was the adoption of a holistic approach to integrate all that data and provide visualisation capabilities to enable the teams to make smarter and more informed decisions.

"So how do we do that? There are a number of processes that are integrated into Centro. How we manage the data, how we view the data, how we provide solutions, those are the three major pillars around which Centro will enhance our operations. We have great technology in directional drilling, we have great technology in LWD, but we don't have a user-friendly way to make it visible and more productive to the team. And that's what Centro will provide, a means to maximise the value of our core technologies through this integration platform."

The product is responding to a real industry need, he added.

"In the industry today, the efficiencies that are needed, your productivity, the whole economic value of what you do, demand that you know what is really happening, that the decisions you make are the right decisions. This tool can pool the information about all your wells globally, so you can see if a well is performing to the optimum scenario, by drawing on comparisons with previous wells, or if it is performing better or worse, in which case you can find out why. This is the best way to bring data in a timely fashion to allow for that sort of analysis and decision making."

The product has been tested both in Weatherford's internal operations, and externally with customers, said Loreto, adding that has won a contract with a major Middle East operator.

"When I switch on my computer, the first thing I do is open Outlook and open Centro; the wells pop up on my screen so you can see them in real time. We know Centro is going to be at the level we aspire to when a customer does the same thing. We need to get to the point when Centro becomes so integral to what we do that it will be natural for people to open it the minute they switch on their computer." ■



Image Credit : Weatherford

Centro combines data management, visualisation and real-time engineering technologies.

Mitigating the impact of COVID-19 with autonomous technology

Ariel Avitan, co-founder and chief commercial officer at Percepto, discusses how quarantine-proof technologies such as autonomous drones can help alleviate the challenges associated with volatile market trends and workforce availability.

THE CORONAVIRUS HAS exposed the soft underbelly of critical infrastructure and industrial sites worldwide – workforce availability. As more and more companies implement business continuity plans to deal with the outbreak, fewer and fewer employees are able to fully function. When facilities do not know who can and will show up for work, both planning and operations are seriously impeded. In Western Australia, for example, the coronavirus is potentially affecting some 60,000 fly-in, fly-out (FIFO) workers at remote mine sites and onshore and offshore oil and gas plants.

And this challenge is compounded by a flagging demand for commodities – oil, natural gas, ore, and other resources – as global industries and economies slow down or even grind to a halt. With the fall-off in demand, the price war between Saudi Arabia and Russia and the resulting price drops, the oil industry is particularly hard-hit, with companies bracing for lower revenues, diminished investment and even large-scale layoffs.

Thus, even as companies are unable to produce at full capacity, they are also unable to sell at full capacity – leading many to take a much closer look at current and future operational expenses and efficiency.

This is leading many companies to rethink the role that autonomous technology – and specifically autonomous drones – can and should be playing in their operations.

Large industrial sites are high-value assets that require constant maintenance and monitoring – independent of both production volumes and market conditions. Even when production is slowed or stopped, and when maintenance personnel are unable to function or even show up at work, critical components still need to be closely monitored, security perimeters need to be maintained, and scheduled maintenance needs to be conducted. The alternative to such monitoring and maintenance can be not only costly but also deadly.

Autonomous drones are an essential part of the contingency plans that support



business continuity. Drones are always available, even if operators are under quarantine, and can help alleviate the challenges associated with volatile market trends and workforce availability.

Multi-mission autonomous drones can conduct security, safety and inspection missions – and be quickly and flexibly re-tasked to meet changing operational demands. This makes them a force multiplier – since a single person operating autonomous drones can replace multiple security, safety and inspection employees.

Moreover, autonomous drones can be controlled remotely, from anywhere in the world. This means that – as long as companies have suitable regulatory permits – employees can work from home, yet operate autonomous drones as if they were on site.

“ Multi-mission, on-site autonomous drones have been proven to increase efficiency and reduce operational costs.”

Finally, even when a near-pandemic is not sweeping the globe – multi-mission, on-site autonomous drones have been proven to increase efficiency and reduce operational costs. By delivering consistent visual asset monitoring, autonomous drones provide true data-driven maintenance, which according to one study can result in up to 45 per cent less downtime and up to 60 per cent greater output or production. Without costly human pilots, autonomous drones provide a massive boost to existing efforts to improve preventative maintenance and reduce unexpected downtime – which can dramatically affect the bottom line in the best of times and help organisations better deal with the loss of revenues in the worst.

Although coronavirus will not, thankfully, be the new normal, it should be a business continuity wake up call. To adapt to the fluctuations of a truly global marketplace, companies need to prepare for all contingencies – including those where human employees cannot fulfill their roles on-site. Investment in autonomous technology today can help critical infrastructure and industrial companies smooth operational and financial bumps in the road, both today and in the future. ■

Digital technologies for asset management of valves & accessories

Digital automation technologies can help you to better manage the entire lifecycle of your valves, resulting in improved efficiency and cost savings at a difficult time, says Saurabh Pathak, MEA leader, Instrumentation Technologies – Flow Control at Emerson Automation Solutions.

CONTROL VALVE SIZING and selection in the oil and gas industry across its value chain needs to adhere to various pipeline and fittings specifications to follow industrial, national and international standards (eg. API, ASME, ISA).

Manufacturing to selected standards and specifications ensures that each piece of equipment is suitable for use under nominal, minimum and maximum plant operating conditions. Furthermore, it is essential to have a well-engineered design as well as knowledgeable personnel to operate and maintain your critical assets. Digital automation technologies can complement these efforts to predictively identify valve problems and better manage the entire lifecycle of your valves.

Digital transformation in oil and gas

The outlook for the oil & gas industry is uncertain due to the COVID-19 pandemic, with global demand collapsing, supply chain impact and a sudden increase in crude oil supply following the suspension of previously agreed upon OPEC+ production cuts. The market is likely to get worse before it gets better, at least in the short term.

To remain competitive, industrial organisations need to improve asset availability, while reducing their operating and maintenance costs. When it comes to maintaining your process equipment, some key areas for improvement can be identified. Think of all the tasks that can increase risk to your uptime, budget and most importantly, your people: locating valves in the field or in the stock yard; validating the construction of valve assemblies; reading through written reports to determine work scope; shuffling through papers to find installation manuals; sending personnel into risky areas of the plant to find critical valves; and assembling and



Image Credit: Emerson Automation Solutions

Saurabh Pathak, MEA leader, Instrumentation Technologies - Flow Control, Emerson Automation Solutions.

disassembling scaffolding to reach valves – to name just a few. Integrating digital technologies into these work practices can improve and optimise efficiency, safety and production availability.

Reactive maintenance typically results in at least some production downtime or degraded performance, resulting in unnecessary damage and cost. At the same time, many

preventative maintenance-based jobs are executed prematurely, creating unnecessary cost. However, condition- or predictive-based maintenance prior to failure, could eliminate both unnecessary down-time related to reactive maintenance and unnecessary costs related to preventive maintenance, thus helping to ensure non-stop production and uncompromised valve performance.

End users in the oil and gas industry have seen up to 40 per cent reduction in maintenance cost on valves due to digitalisation and critical asset management. This technology helps identify valves that require immediate overhaul during upcoming shutdowns, and those still healthy with additional runtime remaining.

Digital transformation across the oil and gas industry has led to instrumentation insights that can be used for next-generation predictive maintenance solutions. These new solutions use data analytics and machine learning tools available in industrial cloud platforms. In addition to improving asset reliability and uptime, this transformation helps reduce maintenance cost by enabling remote access to information for analysis and remote intervention. HSE incidents can also be avoided, reducing harm to the environment and personnel.

Modern digital valve controllers have the intelligence to gather and store valuable diagnostic information, but in many cases this information is not utilised to its full potential. Tapping into this information will enable a more efficient, predictive approach to operations and maintenance. This can yield immediate and long-term benefits to plant uptime, reduce risk and improve availability. A common cause of this lost potential is the lack of specialist diagnostic expertise in your plant maintenance teams. IIoT-based Valve Connected Services enable you to strengthen your condition-based monitoring by collaborating with Emerson expert resources

“ This technology helps identify valves that require immediate overhaul, and those that are still healthy.”

as an extension of your team. Emerson's valve experts utilise software packages that leverage empirical data models to guide end-user maintenance decision making. Valve Condition Monitoring, part of Emerson's Connected Services offering from its Plantweb digital ecosystem, is a scalable and secure portfolio of transformational technologies, software and services that enable you to harness the advantages of this hidden information.

Identify failure modes using condition monitoring

Performance Diagnostics (PD) embedded in Emerson FIELDVUE digital valve controllers include In-Service Online and Out-of-Service diagnostics tests. Early valve problems can be detected In-Service/Online, ranging from improper stroking speed to poor throttling performance, pneumatic leaks, actuator degradation and worn valve components. These diagnostics allow early identification of most hidden valve failure modes, supporting a predictive maintenance vs. a reactive approach.

In addition, the associated online alerts include travel cutoffs and limits, minimum

opening and closing times, input characterisation behaviour, trending as well as travel deviation, supply pressure, drive signal and cycle counters.

Out-of-Service/Offline diagnostic tests provide comprehensive electronics and mechanical integrity checks, and overall valve asset performance health condition.

Asset Tagging and Remote Assistance

Asset Management Tags are intrinsically safe devices which use radio frequency identification (RFID) technology, to enable digital identification and tracking of plant equipment. These RFID tags are pre-affixed to a mounting bracket for ease of installation to the valve assembly or identified equipment. One of RFID's main uses in industrial plants, is updating systems when assets have been moved, received or serviced. A smart tag should have supporting software that allows a technician to quickly access any information needed in the field. The data on the tag should also be accessible by software platforms used for maintenance management, historisation, diagnostics and other tasks. This can result in both time and cost savings.

Another IIoT-based option for supplementing and supporting the workforce is delivered through the Remote Assistance service. As part of this service, Emerson's experts are made available to support customer requests through an augmented reality (AR) platform designed to lead a user through the necessary steps to install and configure or troubleshoot valves in the field or in workshops. This virtual platform enables support from trained experts, from anywhere in the world, without the travel time and logistic costs typically associated with such support. Expert annotation is embedded in the on-site technician's field-of-view allowing them to confidently execute troubleshooting or maintenance activities. Technicians can receive immediate expert support, assisting them to complete repairs to specification.

The oil and gas industry faces a challenging future requiring some tough decision making. Developing and adopting a scalable digital transformation strategy will help turn your process plant into a Top Quartile performer. Having a remote monitoring strategy in place will lead to reduced downtime, safer working environments and real savings to your bottom line. ■

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Applying offshore oil & gas technology to offshore wind

Low oil prices, decarbonisation and new offshore wind technologies herald a new era for the offshore oil and gas industry, says Anne-Marie Walters, industry marketing director, Oil and Gas and Manufacturing at Bentley Systems.

OVER THE PAST five years the offshore oil and gas industry has taken a beating, with low oil prices forcing many owners to rethink their capital investment projects. As a result, they are driving their engineering supply chain to look elsewhere for new business. One of these areas has been the offshore wind industry, where the skills developed over the past 40 years to deliver a thriving offshore oil and gas industry have been applied to solve the challenges of the offshore wind farm industry.

One such example of an engineering company that has successfully reskilled its workforce for offshore wind is Keystone Engineering.

Their journey began in the early part of the 21st century, with the end of the oil boom in the Gulf of Mexico. At that time, oil producers were turning to smaller, less expensive structures that could cost effectively exploit smaller reserves in shallow waters. These structures needed to be built and installed quickly and easily, allowing for more gas or oil to be extracted in a shorter timeframe. The Inward Batter Guide Structure (IBGS) is an example of this type of structure. In early 2001, Louisiana-based Keystone Engineering had submitted its first IBGS design for construction for applications offshore of Nigeria in the Oyot field.

“The process helped optimise the design of the total structure and ensure safe operation.”

Keystone’s IBGS, also called the “twisted jacket,” foundation was first installed (via liftboat) in the Gulf of Mexico in March 2005. That summer this structure took a direct hit from Hurricane Katrina, but as this devastating hurricane passed through the West Delta field in Louisiana, the IBGS



Image Credit: Bentley Systems

The skills developed over the past 40 years to deliver a thriving offshore oil and gas industry have been applied to solve the challenges of the offshore wind industry.

structure was not damaged.

Nowadays, Keystone is bringing its offshore oil expertise to the emerging offshore industry in the USA by providing engineering design and consulting services to the Block Island Wind Farm project in Rhode Island. The project was the first commercial offshore wind farm in the country.

Simulating the Block Island wind farm

The Block Island wind farm is situated off the coast of Rhode Island in the USA and went online in late 2016. This US\$290mn project uses five 6MWGE wind turbines that are supported by Keystone-designed substructures, giving it a total capacity of 30MW.

Keystone designed the substructures by adapting the IBGS steel jacket foundations used in the oil and gas industry as the design basis for the deep-water wind turbine support structures.

To help model the engineering, Keystone used Bentley’s SACS offshore engineering

software to produce an alternative to typical offshore monopile concrete foundations, which are limited to shallower water depths and smaller wind turbines.

The integration of offshore engineering software with DNV GL’s Bladed, a wind turbine simulation tool, enabled Keystone to incorporate load models from the turbine generator designer. The process helped optimise the design of the total structure and ensure safe operation under a wide range of weather conditions, including tropical storms, maximising revenue from the wind farm. By carrying out thousands of load simulations, the foundation is designed to withstand the 100-year flood, and far less steel was required than what is used with a comparable foundation.

Engineering software supports the clean energy transition

For more than 40 years, the world’s offshore engineers have used advanced engineering software, such as SACS, for the design,

fabrication, installation, operations, and maintenance of fixed offshore structures. SACS is widely specified to ensure code compliance across the lifecycle of these structures and is used by engineering certification firms such as American Bureau of Shipping, Bureau Veritas Group, China Classification Society, Germanischer Lloyd AG, DNV, and Lloyd's Register Group, as well as engineering firms.

The software enables engineers to dynamically model any type of offshore structural system and provide optimal design against environmental loads, such as waves, wind, and current, in addition to mechanical loads from wind turbines. Engineers can also fully explore the effects of fatigue, ship impact loads, transportation, and installation.

For the wind power market, the software has been extended to include more complex loads and geometries and is integrated with most turbine manufacturer simulation software for a fully coupled analysis. The integration allows engineers to simulate the loads on a wind turbine platform structure and optimise these steel structures for cost, installation weight, and strength.

Keystone leveraged the technology



Image Credit : Bentley Systems

Anne-Marie Walters, industry marketing director, Oil and Gas and Manufacturing, Bentley Systems.

“ Yet more advances are emerging, including floating offshore wind farms.”

developed for the offshore oil and gas industry to meet the complex design criteria for steel jacket foundations for wind farms. The iterative process optimised the jacket design and reduced the amount of steel needed for the substructure, while still ensuring a design life of more than 20 years. As a result, the Block Island Wind Farm jackets are 15 per cent lighter than a previous design used for the same type of wind turbine in the North Sea. The optimised design also reduced installation costs by more than 20 per cent compared to traditional monopile construction, and can survive hurricane-force winds.

As the oil and gas industry looks to alternative ways to produce energy and offshore engineers look for ways to extend their skills, the offshore wind industry offers some great advantages. The Block Island wind farm example demonstrates innovative thinking with tangible business through reduced installation costs and lower total life costs. And yet more advances are emerging, including floating offshore wind farms. The offshore oil and gas industry has a great deal to offer the offshore wind industry, benefitting everyone involved. ■

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Security teams need to be able to prioritise the threat data and alerts within the context of their organisation.

Image Credit: Adobe Stock

Protecting critical infrastructure

Markus Auer, regional sales manager Central Europe at ThreatQuotient, discusses how to effectively manage cyber threats on critical infrastructure.

CRIMINALS ARE TIRELESSLY attacking critical infrastructure (CRITIS) around the world and compromising the Industrial Control System (ICS) and the Supervisory Control and Data Acquisition (SCADA) systems that control these infrastructures. In 2010, the Stuxnet worm infiltrated numerous control systems and damaged nuclear power plants. Five years later, the BlackEnergy malware attack on the Ukrainian power supply became the first cyberattack that caused a blackout.

However, the term CRITIS not only covers the power grid, but also areas such as military, manufacturing, healthcare, transport, water supply and food production. In 2017, the outbreak of the ransomware WannaCry affected several healthcare companies. In 2018, the US CERT, together with the British National Cyber Security Center (NCSC) and the FBI, issued a warning that the Russian government had launched an attack on critical infrastructure in various industries. In addition,

for several years, threats to air travel booking and public transit systems have been making headlines. In early 2019, the ransomware variant LockerGoga began infiltrating and disrupting the production processes of chemical companies and aluminum producers.

“The existing security teams are barely able to handle the myriad of alerts.”

Important challenges

According to an investigation by (ISC)², there is a shortfall of nearly three million cybersecurity experts worldwide, and nearly 60 per cent of the 1,452 survey respondents believed that their company was at medium to

high risk of virtual attacks. The existing security teams are barely able to handle the myriad of alerts. Moreover, they are often not sufficiently represented at senior management level to receive the necessary attention and support for important initiatives. For example, only 31 per cent of organisations in the aviation industry have a dedicated CISO.

To make the most of their existing resources, security teams must be able to understand and prioritise the threat data and alerts within the context of their organisation. This gives teams the opportunity to easily and clearly communicate relevant security issues to management, and to justify additional resources needed to improve security processes.

More and more attacks use multiple vectors in parallel and make the defense more difficult. The US CERT warning mentioned above mentions a variety of these used TTPs, including spear-phishing emails, watering hole attacks, credential capture, and specific

“ It is not enough to update only the ICS and SCADA devices.”

attacks on ICS and SCADA infrastructures. At the same time, the attack surface is growing as CRITIS operators increasingly migrate to the cloud, introducing mobile devices and IoT. More than two-thirds of IT executives in the oil and gas industry said they are more vulnerable to security breaches because of digitisation.

Companies can protect their digital landscape against threats only if they have an overview of the entire infrastructure and the ability to continuously evaluate and prioritise threat intelligence.

Many ICS and SCADA systems have been in use for years and do not have modern security features that can protect against current threats. The number of reported weaknesses in the production area increased significantly in 2018 compared to the previous year. However, these systems are rarely

updated as operators fear interruptions. Despite increasing attacks on critical infrastructures, protection has not been extended. Rather, it has become even worse as the devices and systems are increasingly connected to the Internet without paying attention to the security implications. Although those responsible for Information Technology (IT) and Operational Technologies (OT) have different goals, processes, tools, and concepts, they must work together as their environments grow closer together.

Surveys among security officers say that 75 per cent of businesses assume they will be the victims of cybersecurity attacks on OT / ICS systems. However, only 23 per cent adhere to the industry's minimum legal requirements for cyber security.

Headlines about attacks on critical infrastructures are quickly portrayed as a sensation. It is often difficult to find the facts behind the report and to understand the impact of a large-scale cyber campaign on the business. It is not enough to update only the ICS and SCADA devices. With a trusted threat intelligence platform, companies can identify and respond to the truly relevant threats. ■

Tips to help organisations minimise their cyber risk

- Consolidate all sources for external (such as OSINT) and internal (SIEM, for example) threat and vulnerability data in one central repository.
- Collect security-related information about the entire infrastructure (local, cloud, IoT, mobile, and legacy systems) by integrating vulnerability data and threat intelligence in the context of active threats.
- Filter non-relevant information, avoiding overload due to too many alerts, and easily navigate massive amounts of threat data to focus on critical resources and vulnerabilities.
- Prioritise the most important data depending on the individual situation, with the possibility of dynamic adaptation as new data and insights become available.
- Proactively search for malicious activity that can demonstrate malicious behaviour, denial of service attacks, and other disruptions and potential harm to customers, employees, and key components.
- Focus on aspects beyond reactive measures to support detection, response and recovery.

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Simulation modelling to optimise oil & gas facilities

Nawaf A. Awad, TPL specialist, Technical Systems Team – Kuwait Oil Company (KOC) CITG, discusses the use of an integrated process simulation model to find bottlenecks in one of the company’s gathering centres, and validate changes required for debottlenecking.

THE TECHNICAL SYSTEMS team headed by team leader Dr. Noha Najem, part of KOC Corporate Information Technology Group, took the opportunity in coordination with Schneider Electric Middle East (AVEVA) to adopt modern innovative technologies that bring value to the business across the entire production cycle. The successful implementation of Management Information System for West Kuwait (MISK) includes a Process Optimisation Module designed to perform process optimisation/“what if” analysis for specific process areas modelled in the simulation application. One can import live plant data, reconcile plant cases in the model and do the analysis. The output of the “what if” analysis is stored as a report and can be accessed by different users.

The Process Optimisation Module has rigorous and high-fidelity dynamic process simulation models for facilities, which helps process engineers to optimise the plant, which in turn leads to overall improvement in the facilities. Mathematical models are based on first principles and will generate the data and variables required for output to external

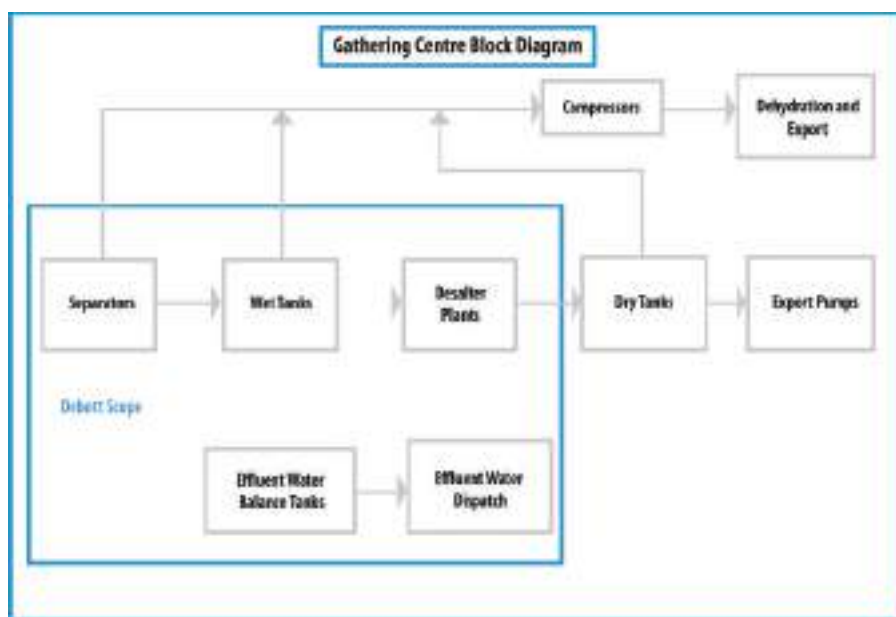


Figure 1: Gathering Centre block diagram.

devices or needed by other simulation systems. Sound physical principles were used in modelling the various plant equipment such as columns, vessels, tanks and their associated components such as compressors, heat exchangers, pumps, and valves.

The KOC Process team wanted to validate whether it is possible to process 40 per cent more effluent water system in the gathering centre by making minimal modifications in the existing facility’s design, or whether large scale modification is required. The result may help to decide whether partial shutdown is enough, or whether turnaround of the facility is required.

A study was performed to find bottlenecks in the gathering centre to increase effluent water rate by 40 per cent, keeping the crude rate as constant. AVEVA DYNASIM, a state-of-the-art, field-proven dynamic process simulation programme was used to develop process simulation models. The existing model was modified to match current plant



Nawaf A. Awad, Technical Systems Team, KOC CITG.

“The Process Optimisation Module has rigorous and high-fidelity dynamic process simulation models for facilities.”

configuration and operation conditions. Data for all the equipment including valves and pipes, along with key isometrics, were validated and ensured that they have been incorporated correctly. Wherever data was not available, it was incorporated based on engineering calculations.

Study performed

Crude flow to facility was maintained constant and water flow was gradually increased by 40

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per cent and a study was performed. Major upsets were captured, and plant was stabilised after each modification. The study included equipment lines along with all the equipment and its control.

The following are details of sections analysed:

- Inlet headers, pipes, control valves on the effluent water path
- Limitations in separators
- Limitations in wet tanks
- Limitations with pumps
- Tanks inlet and outlet of each major equipment.

Results and observations

This work needed strong interactions between process engineering, data gathering and process simulation. The result has shown that the integrated simulation model can identify, with reasonable accuracy, bottlenecks of the plant.

The major benefit of this study was that different configurations were tried and the best suited modification was considered for the final proposal. Once the model was modified, dynamic simulation cases were rerun, and results were evaluated again.

The first cut of debottlenecks were found by increasing effluent rate gradually and parameters along the effluent line were monitored. Each of these limitations were taken care of and the model was rerun and validated.

1. Change the composition to inlet of separators such that Gathering Centre produces specified crude and gas rate and effluent water should gradually be increased by 40 per cent.
2. Operate and stabilise models.
3. Check all the bottlenecks. One will get first



cut of bottlenecks once feed rate to facility is increased.

4. Once a limitation is found in certain sections, find a solution based on different trials. Keep repeating this step.
5. Ensure that the facility is producing specified crude/water/gas as expected once all the bottlenecks are removed.
6. Run the simulation model until the model stabilises and note all observations.

“ Debottlenecking or ‘what if’ analysis with integrated process simulation models can accelerate cost savings.”

Recommendations

Once the integrated dynamic simulation model was run as per the steps mentioned

above, limitations with sections were reported. Some examples are as follows:

- Validation of flow from separator outlet to effluent pump discharge outlet and ensured pressure profile is enough to drive the flow with valves opening in operating range.
- Interface control valves were shifted to tackle low pressure drop across valves from suction to discharge of the pumps.
- Some valves upstream of pumps had constraints, resulting in an increase in valve sizes based on new process conditions.
- Existing effluent water pumps were not enough, hence one more pump was added, and process conditions were validated with simulation.
- Some headers at specific areas were experiencing constraints; provided extra headers with additional connections to accommodate more flows.

After the first level study, modification was finalised, and it was ensured that with new modifications, the plant can process 40 per cent more effluent water and there are no limitations.

Some isometrics were not available. It was decided that remaining isometrics will be implemented, and simulation cases will be run again to check if any new limitation arises due to this change.

Benefits

Debottlenecking or ‘what if’ analysis with integrated process simulation models can accelerate cost savings that can lower total cost of ownership after just a few months’ use. Process engineers can use it not only for studying small modifications, but also large and complex problems such as debottlenecking, feed changes etc. Typical savings areas are as follows:

- Saves operational cost by validating bottlenecks in the integrated simulation models first which leads to less rework and maintenance budgets.
- Gives enough data to decide type and duration of downtime requirement.
- Addresses the risk in HSE by validating design before implementing it in the plant.
- Saves time and costs for process modification. ■

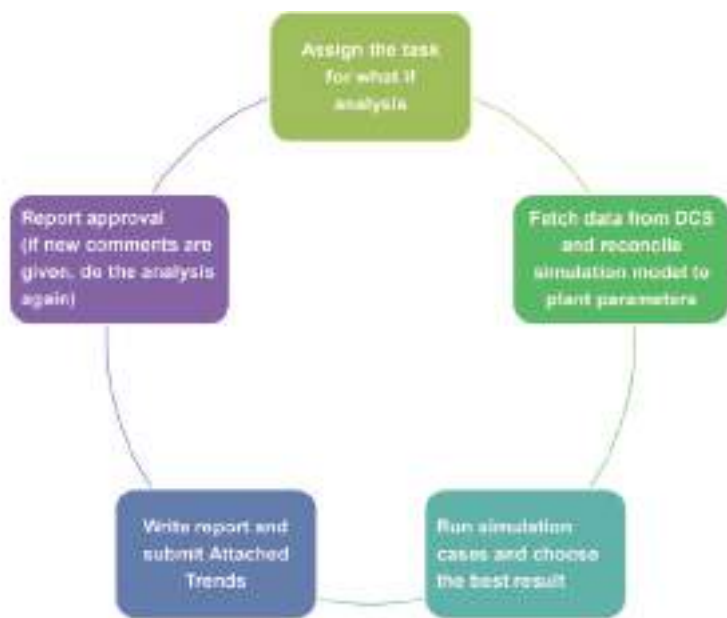


Figure 2: Solution workflow.

Image Credit: KOC

New isolation tool from TD Williamson

GLOBAL PIPELINE SOLUTIONS provider T.D. Williamson (TDW) has introduced the ProStopp DS isolation tool, the first double block and bleed technology for the gas distribution market. It is currently available for 6-inch to 12-inch pressurised carbon steel pipelines.

The ProStopp DS isolation tool achieves a double block and bleed isolation utilising two plugging heads with a bleed port in between. This allows product to bleed through the housing so there is less hardware on the line.

“Gas distribution is critical to everyday life and shutdown is never an option,” said Ryan Ragsdale, senior product manager, hot tapping and plugging technology. “The ProStopp DS solution is a reliable way to ensure a safe work zone during pipeline repair and modification, without interrupting service to downstream customers.”

ProStopp DS isolation technology features a hydraulically activated energised seal that conforms flawlessly to multiple internal pipe diameters. The variable design increases the likelihood of first-time sealing success and eliminates leaks in even tough crevices and weld seams.

“Because the energised seal accommodates multiple inner diameters, it takes the guesswork out of tool configuration while drastically reducing inventory needs,” Ragsdale said. “The built-in chip sweep helps ensure a leak-proof seal while also reducing operation requirements. And because the tool is ground-operated, the technician makes fewer trips up and down the ladder, completing jobs faster and with less risk.”

Flexible fire suppression solution

JOHNSON CONTROLS HAS launched SAPHIRE COMPACT, a cost-effective, direct low pressure (DLP) solution for the protection of small, electrical enclosures. Designed to protect small electrical enclosures with both natural ventilation and forced airflow, the new fire suppression system will allow quick and efficient detection and extinguishment in a large number of facilities, such as oil and gas sites and power generation plants.

Certified to Loss Prevention Standard (LPS) 1666 and ISO 9001 standards, SAPHIRE COMPACT can protect up to four electrical enclosures with one single system, including multi-compartment enclosures for increased flexibility. By discharging 3M Novec 1230 Fire Protection Fluid, a fast acting and electrically non-conductive clean agent, the new system can suppress fires without causing damage to electrical equipment, as well as being safe for the environment.



The new system features a pressurised detection tube, designed to detect and suppress the fire.

Image Credit: Johnson Controls

Gardner Denver launches new fluid end

GARDNER DENVER HIGH Pressure Solutions (HPS), the leading total solutions provider for the drilling, well servicing and frac pumps market, has launched its new, next-generation, cost-efficient fluid end: the Gardner Denver VX hydraulic fracturing pump fluid end (VX).

The lightweight VX has been designed for use with GD-2500Q hydraulic fracturing pumps and comparable 8 in. stroke quintuplex power ends from other manufacturers, as a replacement for the larger and heavier Gardner Denver SGWS fluid end. The VX represents an economical alternative to the SGWS fluid end while utilising many of the existing SGWS internals such as valves and seats, Redline consumables, patented Falcon Technology, and suction cover retainers.

Tony McLain, vice president of sales for Gardner Denver’s HPS division, said, “The VX fluid end is revolutionary in our industry as it weighs 2,000 lbs less than standard industry fluid ends, while maintaining the performance, longevity, and convenient installation configuration of our traditional SGWS. Our testing has proven that the VX is an inexpensive alternative to the SGWS while fatigue life, thread strength, and washout life meet or exceed that of the SGWS. The new VX utilises a standard 6-bolt flange configuration and is a direct replacement for the SGWS and most competitor fluid ends.”



Image Credit: Gardner Denver

The Gardner Denver VX fluid end.


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Technique introduced for determining the contents of crude oil

A NOVEL, LOW-COST approach to multiphase metering – the process of determining the make-up of crude oil as it is pumped from the reservoir – has been demonstrated by engineers from Brunel University London.

“Most of the currently available metering systems have certain limitations and they require test separators, high maintenance cost and human interaction,” said Dr Syed Bukhari, a researcher for Brunel’s College of Engineering, Design and Physical Sciences. “Therefore, there is a need for an accurate, less expensive and compact system that uses non-invasive and non-intrusive technology.”

Dr Bukhari’s proposed new system combines electrical capacitance tomography (ECT) imaging technology with artificial intelligence to quickly determine the contents of pumped crude oil.

“In this technique, two ECT sensors are placed at two different locations in an oil pipeline,” said Dr Bukhari.

“A hybrid technique, based on principal component analysis (PCA) and cluster analysis (CA), is used to evaluate ECT images and to identify the time interval necessary for a specific process condition to be detected by both sensors.

“Once this information is obtained, volumetric flow rate and mass flow rate can be calculated using the cross-sectional area of the pipeline and the average velocity.”

The researchers were able to demonstrate that using their new method, an error rate of less than five per cent was possible – a figure comparable to current, more expensive, invasive systems.

“It is expected that the proposed device will provide fast, accurate and reliable measurements as well as additional information on flow patterns and flow velocity typically not available with standard flow meters,” said Dr Bukhari.

“This feature will allow oil and gas companies to increase profitability, safety and operational excellence.”



The new system can quickly determine the contents of pumped crude oil.

Image credit: Shutterstock

New methodology addresses CUI

A NEW METHODOLOGY designed to address the major safety threat and multi-billion-dollar cost posed by corrosion under insulation (CUI) has been published by DNV GL.

CUI, a type of corrosion which arises when water becomes trapped between insulation and the piping and vessels it is designed to protect, is a major safety challenge and the single most expensive corrosion issue in the oil & gas and petrochemical industries

DNV GL’s industry-first methodology helps integrity engineers and plant managers to identify the areas of a plant with the greatest current and future risk of CUI and take action to prevent failures.

Recommended Practice (RP) DNVGL-RP-G109 was developed in collaboration with several regulatory bodies, international oil and gas operators and major players in



CUI is a major threat for the oil and gas industry.

Image credit: DNV GL

the supply chain to deliver a practical and cost-effective methodology for managing the threat of CUI, and is setting a new standard for managing CUI risk.

DNV GL’s RP Koheila Molazemi, Technology and Innovation director, DNV GL – Oil & Gas said, “Corrosion under insulation is recognised as the single most expensive corrosion issue in the oil and gas and petrochemical industries. Our Recommended Practice has been developed as a guide to the most effective and efficient way to assess, mitigate and systematically manage the risk.”

DNV GL has also developed a digital tool to support the implementation and use of its methodology. CUI Manager applies machine learning to CUI data gathered from operators with the methodology from DNV GL’s Recommended Practice, to continuously assess and calculate the risk of CUI in process plants. It can reduce the cost of CUI-related maintenance by up to 50 per cent, says DNV GL.

New wireless sensor for condition monitoring

SKF HAS RELEASED a compact and cost-effective vibration and temperature sensor for monitoring the condition of rotating parts on heavy industrial machinery. Designed principally for use as part of an SKF Rotating Equipment Performance (REP) solution, the sensor – called the SKF Enlight Collect IMx-1 – enables customers to reduce both expensive unplanned downtime and their maintenance costs.

Powered by long-lasting batteries, the sensor can be deployed in large numbers to automate the gathering of data regarding the health of machinery, a process typically carried out by technicians with manual portable devices. When mounted to a bearing housing, collected data can be wirelessly sent to a host computer network, where it can then be forwarded to cloud-based analysis services at SKF REP centres.

Product Line manager at SKF, Chris James, said, “The new, highly accurate, robust sensors enable data to be collected more frequently from locations that were previously inaccessible by hand, using fewer technicians.”

The system relies on a “mesh network”, which allows the sensors to relay data between one another, meaning that data can be routed around radio obstacles, such as pipework and liquid storage vessels, and sent over greater distances than would be possible using a single device. The SKF Enlight Collect IMx-1 has been designed specifically to achieve a tough ingress protection rating of IP69K. This means it will work reliably when exposed to dust, dirt, oil, grease, contaminants, temperature changes, wind, rain, high-pressure hot water washdowns and more.



The sensor in use.

Image credit: SKF

Pump market set for uncertain future?

Strong growth in the industrial pumps segment now seems uncertain after a rough few months. Martin Clark reports on the possible implications for the Middle East and Africa looking ahead.

THE PUMPS MARKET was expected to thrive in the coming years, supporting a resurgent oil and gas industry, although that has all now been thrown into doubt in the wake of the coronavirus pandemic. One forecast by Technavio announced at the end of January 2020 that the global industrial pump market was poised to grow by US\$1.54 billion or seven per cent through to 2024. It cited key market drivers such as the increasing benefits of pump rental services and innovations in service delivery as helping underpin the anticipated growth.

Another report, *Global Oil Refining Pumps Market*, said on 4 March 2020 that the sector “will rise at a significant rate” during its forecast period, through to 2025, although it is not clear how recent events may have been taken into account.

But the reports also highlighted how volatility in the market often discourages companies in the oil and gas sector and other industries, such as automotive, to make large-scale capital investments.

Given the volatility that has hit the energy sector since the turn of the year, that now seems almost certain to adversely impact its overall projected growth rate for the foreseeable future. One trend that could hold up, even in light of current events, is the shift to rentals.

“The growing emphasis on reducing operational costs is compelling end-users to rent equipment rather than making the purchase,” the Technavio report states.

“Equipment rental allows end-users to

“Equipment rental allows end-users to access the latest technologies at cost-effective rates.”



Will the pump market recover from the COVID-19 crisis?

Image Credit : Adobe Stock

access the latest smart pumping technologies at cost-effective rates. Moreover, advantages such as flexible work delivery setup, professional services and consulting, timely service responses, and a wide range of product availability for fluid handling systems provided by pump rental service providers are factors fuelling the growth of the market.”

Major players in the pumps market include the likes of Flowserve, Sulzer, Weir Group and TechnipFMC among many others. Despite the abrupt, adverse market conditions, these companies continue to upgrade and refine their product offer to the oil and gas industry.

In March, Amarinth, which specialises in

centrifugal pumps for the energy sector, appointed a new Africa sales manager, Itai Choi, to support the strong growth the company sees in the region. He will split his time between bases in Nigeria and London, focusing on core territories such as Algeria, Uganda, Mozambique, Senegal, as well as Nigeria.

Oliver Briggshaw, Amarinth’s managing director, said the intention is to provide local, on-the-ground support where projects are being undertaken in Africa: “We always strive to deliver localised support where we can, as in the case of our established Middle East and Asia Pacific territories.” ■

InEight and Jovix join forces to reduce mega-project delays

INEIGHT, A LEADING construction technology solutions provider, is working with Atlas RFID to offer its Jovix software solution. The alliance will leverage Jovix RFID and mobile technology to track materials on mega-projects within InEight's comprehensive portfolio of project management solutions.

The combined offering will help operators, engineers and contractors in the energy, construction, chemical and mining sectors accelerate their digital transformation efforts. To streamline operations and advance digital adoption, InEight's solutions combined with Jovix will support organisations in reducing non-productive time, minimising schedule impacts and cost overruns, and improving on-site productivity.

"The relationship with InEight is a natural one," says Robert Fuqua, CEO of Atlas RFID. "We both believe in the power and value of the company's digital solutions for industry users and will work together to digitalise the construction supply chain and create a transparent understanding of material readiness for our users."

"The ROI of Jovix is significant. Craft productivity can be improved by per cent through better workface planning and materials availability. With Jovix alone, we've found that decreasing wait times by 10-12 per cent on a US\$1bn construction project can result in a US\$12-20mn cost reduction. Ultimately, our affiliation will aid company digitalisation and give industry professionals in any sector confidence that materials will be available when and where they are needed to deliver predictable project outcomes," adds Fuqua.

Jake Macholtz, CEO at InEight, comments, "We're helping drive digital transformation efforts in a number of the sectors we serve. By working with



Image Credit: Adobe Stock

The combined offering will help to streamline operations.

Jovix, we give our clients a simple way to advance their digital workflows. Our solutions can help reduce costs and schedule impacts for capital projects of all sizes. The powerful combination of Jovix and our solutions will give project stakeholders yet another dimension of assurance for their operations."

Saga Group continues to focus on expanding overseas markets

SINCE 1984, THE Saga Group has practiced a customer-first approach to delivering customised cementing accessory solutions to an expanding global market. Constantly seeking improvement, Saga's expanded product and services portfolio includes production chokes, drill-stem testing and casing packers.

Saga's director Middle East & Africa, Kim Sadler, explains the benefits Saga brings to their customers: "We are well known

throughout Asia for our liner hangers and other downhole tools, but much of our product portfolio like production chokes and casing packers are also suited to conditions found in the Middle East and Africa."

In recognition of Saga's total commitment to quality, PT Sagatrade Murni has been awarded API 11D1 certification for their manufacturing processes of liner hanger and production packers. This qualification offers customers further assurance of Saga's unwavering

commitment to excellence, quality and reliability.

Kim Sadler explains why API 11D1 has become essential to maintain Saga's quality standards. "We have been working diligently to achieve API 11D1. Our philosophy has always been to deliver the highest quality oilfield tools and the best service at all times. The need for increased range and higher specifications never ceases, and gaining API 11D1 is another step we've taken to ensure our products are meeting the highest quality and consistency."

Saga added Lancaster Flow Automation LLC to its portfolio of companies in 2014. Lancaster designs and manufactures premium high-performance chokes used in the most challenging onshore and offshore oil and gas field environments. In 2018, Saga Lancaster opened a service centre in Abu Dhabi to provide rapid service and attend to the needs of their Middle East customers.

Consistent with its total commitment to quality, Lancaster has API 6A certification for the manufacture of all its chokes.

For more information regarding Saga PCE liner hanger equipment and services, Kim Sadler can be contacted at kims@sagapce.com.

Regarding Lancaster Flow Automation chokes, Gerardo Haro-Valdez can be contacted at gerardo@lancasterflow.com. Saga PCE is headquartered in Singapore and is the exclusive worldwide distributor for PT Sagatrade Murni products and services.



Image credit: SAGA

The SAGA Group has been in operation since 1984.

LiuGong Dressta wins Back-To-Back Red Dot Awards

LiuGong Dressta's design team has won back-to-back Red Dot Product Design Awards with the new Dressta TD-16N crawler dozer, which sets a new benchmark for visibility.

RIGHT FROM DAY one, the LiuGong Dressta design team's brief was simple – create the best all-round dozer for the customer. The winning team headed by Ed Wagner, (executive director of new technology) and Gary Major, (executive director of industrial design) knew that the operator was essential to designing something truly unique.

Ed recalls, "We literally started with the operator, the blade and the tracks and then built everything around them without compromise."

The result is a dozer with unrivalled all-round visibility encompassing 309 degrees. According to Major, "As with our previous award-winning motor grader the 4180D, we set out to create the best visibility in class with the TD-16N – I think we've achieved that. I think it's also true to say that benchmark visibility is becoming one of the defining characteristics of our design ethos. We know how important visibility is, not only for safety, but for productivity and operator satisfaction too."

The new dozer features a mid-cab design over a mid-mounted automatic, dual path

“ We literally started with the operator, blade and tracks, then built everything around them without compromise.”



Image Credit: LiuGong Dressta

This award-winning dozer sets new standards for visibility, earth-moving performance and safety.

hydrostatic drive train. It comes digital ready and with a standard six-way angle blade. Controls are easily accessible, intuitive, and easy to use thanks to the electro-hydraulic joysticks. With an operating weight of 19,090 kg (42,090 lb) and Net horsepower of 170 hp (127kW), it has the power and performance Dressta is well known for. While visibility was high on the design team's agenda it was not the only consideration, operator safety was also a priority.

"Every operator out there has a story about falling off the tracks ... This is the first machine where you don't have to get onto the tracks," Major said.

Firstly, the team designed non-slip steps at the rear of the machine, totally negating the need to step onto the tracks. Complete with safety handrails these steps always allow easy access to and from the cab with three points of contact maintained.

The TD16N is the only dozer in its size class with this type of "no tracks" access. Secondly, they ensured that all access points

for daily checks, maintenance and fuelling were reachable from ground level.

"It's a great honour to win back-to-back Red Dot Awards," commented Dressta Chairman, Howard Dale, "it's an unbelievable achievement that underlines the amazing work Ed, Gary and the whole design team do every day. I think it says a lot about how far we have come as a business and where we are heading. Chinese manufacturers are not usually known for design but our growing reputation for design excellence is making the industry sit up and take notice. Our investment in R&D has reached new records and we are making giant leaps in intelligent and connected machine technology. Two Red Dot Awards are fantastic but they are only the start of our story, we are on an upward trajectory. I'm convinced that the industry will see that Dressta offers something really different in the market: cutting edge design as standard." ■

Project Databank

Compiled by Data Media Systems

OIL, GAS AND PETROCHEMICAL PROJECTS, KUWAIT

Project	City	Facility	Budget (\$ US)	Status
KGOC - Al Khafji Gas and Condensate Export Pipeline	Al-Khafji	Gas Pipeline	2,10,00,00,000	Construction
KIPIC - Al Zour LNG Import And Regasification Terminal	Al Zour	Liquefied Natural Gas (LNG)	3,33,00,00,000	Construction
KIPIC - Al Zour New Refinery - Overview	Al Zour	Petroleum Oil Refinery	19,00,00,00,000	Construction
KIPIC - Al Zour New Refinery - Package 2 (Support Process Plant)	Al Zour	Petroleum Oil Refinery	3,00,00,00,000	Construction
KIPIC - Al Zour New Refinery - Package 3 (Utilities and Offsites)	Al Zour	Petroleum Oil Refinery	2,10,00,00,000	Construction
KIPIC - Al Zour New Refinery - Package 4 (Tankage)	Al Zour	Petroleum Oil Refinery	1,60,00,00,000	Construction
KIPIC - Al Zour New Refinery - Package 5 (Marine Facilities)	Al Zour	Petroleum Oil Refinery	85,00,00,000	Construction
KIPIC - Al Zour Petrochemical Complex	Al Zour	Petrochemical Plant	7,80,00,00,000	FEED
KNPC - Clean Fuels Project - Mina Abdulla Refinery - Package 1	Mina Abdullah	Petroleum Oil Refinery	4,00,00,00,000	Commissioning
KNPC - Clean Fuels Project - Mina Abdulla Refinery - Package 2	Mina Abdullah	Petroleum Oil Refinery	4,00,00,00,000	Commissioning
KNPC - Clean Fuels Project - Mina Al Ahmadi Refinery Package	Mina Al Ahmadi	Petroleum Oil Refinery	5,00,00,00,000	Commissioning
KNPC - Clean Fuels Project - Package 1 - Mina Abdulla Refinery Units 111, 112, 113 and 216	Mina Abdullah	Petroleum Oil Refinery	55,00,00,000	Commissioning
KNPC - Kuwait Clean Fuels Project - Overview	Various	Petroleum Oil Refinery	13,00,00,00,000	Commissioning
KNPC - Mina Abdulla Debottlenecking of Coke Unit 20	Mina Abdullah	Petroleum Oil Refinery	10,00,00,000	Construction
KNPC - Mina Al Ahmadi Refinery Fifth Gas Train	Mina Al Ahmadi	Gas Processing	1,50,00,00,000	Construction
KNPC - New Local Marketing Depot At Matlaa Area	Northern Kuwait	Oil Storage Tanks	1,32,00,00,000	FEED
KOC - Al Zour New Refinery Crude Oil Pipelines	Ahmadi	Oil Pipeline	84,50,00,000	Construction
KOC - Installation Of New Desalter Train AtGC- 9, GC-10, GC-19 & GS-21	Various	Crude Oil Distillation Unit	25,00,00,000	Engineering & Procurement
KOC - Jurassic Production Facilities Off-Plot Works	Northern Kuwait	Oilfield Development	25,40,00,000	Construction
KOC - Jurassic Production Facility (JPF) - JPF-4 and JPF-5	Northern Kuwait	Oil & Gas Field	70,00,00,000	FEED
KOC - Kuwait Bay Exploration	Various	Offshore Oil Exploration	90,45,00,000	Engineering & Procurement
KOC - New 48" Crude Transit Line From North Kuwait To CMM (TL-5)	Northern Kuwait	Pipeline	39,50,00,000	Construction
KOC - New Strategic Gas Export Pipeline From North Kuwait To Mina Al-Ahmadi Refinery	Northern Kuwait	Gas Pipeline	48,00,00,000	Engineering & Procurement
KOC - North Kuwait Gathering Center (GC) 32	Northern Kuwait	Gas Gathering Centre	1,65,00,00,000	Construction
KOC - North Kuwait Manifold Gathering System for Gathering Centers (GC) 29, 30, 31	Northern Kuwait	Gas Gathering Centre	2,50,00,00,000	Construction
KOC - Small Boat Harbor Project	Ahmadi	Ship Yard	1,00,00,00,000	Construction
KOC - South East Kuwait BS-160 Upgrade	Southeast Kuwait	Gas Processing	27,00,00,000	FEED
KOC - Wara Pressure Maintenance Project - Train 3	Southeast Kuwait	Oil Field Development	50,00,00,000	Construction
KOC - Water Management Project - Gathering Centers 3, 4, 7, 21	South Kuwait	Gas Gathering Centre	24,50,00,000	Construction
KOC - Water Management Project - Gathering Centers 6, 8, 11, 19	Southeast Kuwait	Gas Gathering Centre	24,00,00,000	Construction
KOC - Water Management Project - Gathering Centers 9, 10, 20, 22	East Kuwait	Gas Gathering Centre	19,60,00,000	Construction
KOC - Water Management Project - Overview	Various	Gas Gathering Centre	68,10,00,000	Construction
KOC - West Kuwait BS-171 Gas Sweetening Facility	West Kuwait	Gas Treatment Plant	30,00,00,000	FEED

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Project Databank

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Project Focus

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Project Summary

Project name	KOC - Jurassic Production Facility (JPF) - JPF-4 and JPF-5
Name of Client	KOC - Kuwait Oil Company
Estimated Budget (US\$)	(US\$) 700,000,000
Facility Type	Oil & Gas Field
Status	FEED
Location	Northern Kuwait
Project Start	Q1-2018
End Date	Q2-2021
FEED / PMC	KOC - Kuwait Oil Company
Award Date	Q2-2020

Background

The Kuwait Oil Company (KOC) has recently established three plants for the production of free gas and light oil according to Jurassic Production Facility (JPF) system. Each plant has capacity for 104 million standard cubic feet (mmscf/d) of free oil per day and 40,000 barrels of light oil per day (bopd). KOC plans to establish two more JPFs which will be called JPF-4 and JPF-5. Together the two contracts will create an onshore surface production facility with the capacity to produce 50,000 bopd and 150 mmscf/d of gas.

Project Status

Date	Status
Apr 2020	The tender for the project has still not been released.
Dec 2019	CAPT has announced the start of pre-qualification process for construction of the proposed facilities.
May 2019	The project tender documents have been sent to the Central Agency for Public Tenders (CAPT) for approval.
Mar 2019	All the necessary approvals for both JPFs have been obtained from the senior management and the concerned committees.
Aug 2018	The companies that are awarded the project will have 22 months to execute the project and then will operate and maintain the facility for five years. KOC has an option to buy the facility after a period of five years.
Aug 2018	The new contracts are called JPF-4 and JPF-5. Both of the contracts will be tendered using Kuwait's early production facility (EPF) contract, rather than the engineering, procurement and construction (EPC) model.

Project Scope

The project scope includes:

- Two Jurassic Production Facilities (JPF) with the capacity to produce 50,000 barrels of oil a day (bpd) and 150 million standard cubic feet of gas a day (mmscf/d).
- A water treatment unit. • A sulfur recovery unit. • Associated facilities: a control room, substations and buildings.

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.

Country	MARCH 2020			VARIANCE From Last Month	FEBRUARY 2020		
	Land	OffShore	Total		Land	OffShore	Total
Middle East							
ABU DHABI	44	22	56	-7	43	20	63
DUBAI	0	2	2	0	0	2	2
IRAQ	74	0	74	+2	72	0	72
KUWAIT	56	0	56	+1	55	0	55
OMAN	55	0	55	+2	53	0	53
PAKISTAN	19	0	19	+1	18	0	18
QATAR	4	9	13	-1	4	10	14
SAUDI ARABIA	96	18	114	0	96	18	114
SUDAN	4	0	4	-2	6	0	6
YEMEN	1	0	1	0	1	0	1
TOTAL	373	55	428	+1	373	54	427

North Africa

ALGERIA	34	0	34	-4	38	0	38
EGYPT	25	4	29	+1	24	4	28
LIBYA	9	2	11	-5	14	2	16
TUNISIA	2	1	3	+1	2	0	2
TOTAL	70	7	77	-7	78	6	84

Source: Baker Hughes

عمليات وتخطيط رقمي بالكامل. وعتدلة يحظى تطوير العمليات بالسلاسة وتزداد فعاليتها بشدة.

3 - العمليات والتخطيط الرقمي:

تصنف الشبكات المتكاملة لإنتاج المواد البترولية بشدة تعقيدها وصعوبة ونُصح تصور لتخطيطها وتشغيلها. وفي الوقت ذاته، تزايد فرص تحسين هامش الربح بتقلب الطلب على المواد الأولية. إذ تعمل سلسلة الإمداد الموسدة على ربط خزانات النفط التي ظلت منفصلة عن بعضها بعضاً منذ اكتشافه، وزيادة الأرباح عن طريق دعم بيانات السوق والبيانات الاقتصادية المتوفرة في الوقت الحقيقي بالمعلومات المتوفرة عن حالة المحطة والإنتاج في الوقت الراهن. وبذلك يمكننا هذه الرؤية الشاملة، التي توفرها لنا سلسلة الإمداد الرقمي، من وضع تصور لجوانب الشركة بأسرها وتحليلها وتعظيم الاستفادة منها، فنتمكن من تقييم أثر الشوك وتغير البيانات وتقييمها في وقتها الحقيقي. وسيكون للتحويل الرقمي - على المدى الطويل - عظيم الأثر في جوانب قطاع النفط والغاز كافة. وقد أثبت لنا هذا القطاع - دائماً وأبداً - أنه لا يحني خيرته إلا من يادر بفكره.

وكلنا تعلم أنه دائماً ما تُخفّض المؤلّقات والنققات العامة في البيئة الاقتصادية في عالم اليوم. ويواجه منجوع النفط والغاز زيادة تكاليف الإنتاج، والمنافسة العالمية، وارتفاع تكاليف الطاقة. فإذ أزدت الشركات التغلب على هذه التحديات، فعليها تعزيز عمليات الإنتاج، وتحسين الأداء، لكي يتعكس ذلك إيجابياً على أرباحها. ومن ثم، يوفر التحول الرقمي باقة من الأدوات الجديدة التي تمكن منتجي النفط والغاز من زيادة قدرتهم على المنافسة في الأسواق والقطاعات التي يعملون بها.



محمد عوايد

2 - تصميم العمليات القائم على الحوسبة السحابية: توفر الحوسبة السحابية فرصاً عدة لخفض النفقات المخصصة لتصميم العمليات. إذ يمكن تصميم العمليات في وقت أقل، وخفض تكاليف إعداد النماذج وبرامج التدريب من خلال الاستفادة من هياكل الحوسبة السحابية التي توفر إمكانيات تكاد تكون غير محدودة لمعالجة البيانات وتخزينها. ويمكن لهذه الهياكل أن توفر بيئة مواتية لإعداد النماذج المفتوحة، وتوسيع دائرة مزيا المحاكاة إلى مجالات لم تجد من يوقها حلها في يومنا هذا، كالمفاعلات والبوليمرات والمجالات التخصصية.

ويمكن لهذه التغطية الرقمية أن ترتقي بعملية الإنتاج ارتقاءً مستمراً وتدرجياً، وتساعد الشركات الناشئة على زيادة نموها بعد توقف المحطات لتطويرها أو إصلاحها وتصحيح عيوب نماذج التطبيق. ويتيسر لنا، عن طريق المعلومات المتوفرة عن تصميم العمليات، والتي تتمركز في مستودع رقمي في السحابة، أن نصيف إليها معلومات مكثفة، ونخطو بالشركة نحو نموذج

دولار سنوياً بحلول عام 2025.

ويمكن تحقيق هذا التحول على أرض الواقع من خلال سلسلة من الأدوات الرائدة التي شُملت لمختلف الشركات العاملة في قطاع المواد الهيدروكربونية، سواء التجار أو الموزعين. ويمكن للتقنيات الرقمية أن ترتقي بقطاع النفط والغاز من خلال ثلاثة طرق رئيسية:

1 - رفع كفاءة العمليات عن طريق التوائم الرقمي:

يُقصد بالتوائم الرقمي وجود تمثيل افتراضي لأحد الأصول المادية؛ كالمنظفة أو المونور أو التوربين، أو حتى العملية الصناعية بأكملها أو المحطة برمتها. ويساعد بذلك في الإدارة الكاملة لدورة حياة الأصول المادية، بدايةً من مرحلة التصميم وما يشمل دورة حياة تلك الأصول بأكملها، وتمكننا هذه النسخ الرقمية المتطابقة للأصول المادية، والتي ترصدها رسداً آلياً، من جمع بيانات التشغيل وعرضها وتحليلها في لمح البصر، فتساعد بذلك في تحقيق أقصى عائد رأس المال وزيادة أرباح الشركة. وتستطيع بذلك رفع القدرة الحاسوبية أو حفظها، وإضافة امتيازات المستخدم أو تعديلها أو حذفها حسب الحاجة، ومواومة المحطات والمنشآت سريعاً مع متطلبات السوق والمعايير القانونية المتغيرة. وبذلك ترتفع كفاءة العمليات في مختلف قطاعات الشركة، ويتمنى للمشغلين تقييم السيناريوهات المحتملة في عمليات المعالجة والتصنيع والتوزيع في دفعات. ويؤدي إحاطة أصحاب المصلحة علماً بهذه المعلومات إلى زيادة قدرتهم على تصور نتائج العمليات ومؤثرات أفعالها الرئيسية. أضاف إلى ذلك أن برامج التحكم التنبؤية تساعد في تحقيق الاستفادة القصوى من مراحل العمليات، لأنها ترتقي بها إلى العمل بأقصى طاقتها، مما يقلل من تقياتها، ويزيد من أرباحها.

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التقنيات الرقمية في قطاع النفط والغاز

أصبحت صناعة النفط والغاز على مشارف النضج الرقمي. وبذلك يستطيع هذا القطاع جني ثمار هذا التحول الرقمي من خلال رفع معدلات الإنتاج وزيادة الأرباح حتى لو تعرضت الأسواق للقلب وعدم الاستقرار، وذلك وفق ما صرح به السيد محمد عواد، نائب الرئيس الإقليمي للشرق الأوسط وشمال إفريقيا وباكستان بشركة أفيثالتكنولوجيا المعلومات.

ويرفع معدلات الإنتاج. ويحقق بذلك مزايا تنافسية كبيرة بوجه عام. ويقيد استشاريو الإدارة - مؤسسة ماكنزي - بأنه يُمكن، لتعظيم الاستفادة من التقنيات الرقمية، كالحوسبة السحابية، وإنترنت الأشياء الصناعي، ونظم الاتصالات المتنقلة والذكاء الاصطناعي، والواقع الافتراضي، والبيانات الضخمة، والتحليلات، خفض نفقات رأس المال بمعدلات كبيرة تصل إلى 20 في المائة في مختلف قطاعات هذه الصناعة. وسيؤدي تبني هذه التقنيات الحديثة إلى تحسين إجمالي التدفقات النقدية بمقدار 11 دولاراً لكل برميل في سلسلة إمداد النفط والغاز بالحقول البحرية، وهو ما يضيف 300 مليار

بدوره في تمكين العمليات وفعالية التكاليف. وهذا الأمر يبشر بالخير، لا سيما في الأوقات التي تنقلب فيها أسواق هذه الصناعة. إذ تتزايد الضغوط التي تواجه شركات النفط والغاز على المستويات كافة. ويعدداً عن التحديات التي يفرضها عدم استقرار أسعار السوق، فإن الضغوط البيئية، وتزايد التهديدات الأمنية، وتشديد شروط الالتزام بالوائح والقوانين، تخلق مشهداً معقداً لم تعهده هذه الصناعة من قبل. أما التحول الرقمي، فبوسع - في ظل هذه الظروف - أن يرتقي بتجربة العملاء، ويعزز توليد القيمة في دورة حياة العمليات والأصول، ويزيد الأرباح، ويضاعف عائدات رأس المال،

لقد وُفقت مجموعة شركة بترول أبوظبي الوطنية (أدنوك) في الاسم الذي اختارته لمركزها الجديد بعنوان: مركز بانوراما للتحكم الرقمي. إذ يضم هذا المركز شاشة عرض فيديو عملاقة منطوية يبلغ طولها خمسين متراً، ولن يُعد هذا ضرباً من الخيال في أفلام هوليوود الأمريكية في قابل الأيام. ولكن بغض النظر عن هذه التقنيات البصرية الرائعة، فإن الحلول الجديدة التي أنتجتها شركة أفيثا تعطي قطاع النفط في أبوظبي ميزة إستراتيجية شديدة الأهمية. إذ تستطيع بنظرة واحدة أن ت شاهد معلومات آنية متكاملة عن عمليات الشركة وشبكة التوزيع بها. وهذا يساعد

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تحليلات

التحديات الرقمية في قطاع النفط والغاز

ملخص محتويات القسم الإنجليزي

تقرير خاص: المملكة العربية السعودية

استطلاعات: التكرير والبروكيمابويات، تخزين النفط، التنوع والاستيعاب

تقنيات: المضخات والمضامات، طلاء الأنابيب، تقنية حقول النفط البحرية، الأمن السيبراني

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الشرق الأوسط

التقنيات الرقمية في قطاع النفط والغاز

التحول الرقمي، في قطاع النفط والغاز، يوفر مزايا رفع معدلات الإنتاج وزيادة الأرباح، حتى لو تعرضت الأسواق للتقلب وعدم الاستقرار.