EGYPT OIL&GAS NEWSPAPER

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QHSE: THE INDUSTRY'S STAMINA

- HEALTH RISKS CONTROL IN OIL AND GAS INDUSTRY
- TECHNOLOGY, THE ACHILLES HEEL OF FUEL PRODUCTIVITY
- UNCONVENTIONAL GAS AND ENVIRONMENTAL SUSTAINABILITY
- US WITHDRAWAL FROM THE PARIS AGREEMENT: THE LEGAL IMPLICATIONS (OR LACK THEREOF) ON THE ENERGY INDUSTRY

EDITOR'S NOTE

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The oil and gas industry composes a delicate sector that involves high-risk operations directly related to its staff's safety and health, the environment, and production performance. As such, Quality, Health, Safety, and Environment (QHSE) Management is a priority to the industry for the establishment of a successful oil and gas organization.

In this issue, EOG researched crucial aspects of QHSE Management and disclosed the sector's maneuvers and prospects to overcome environmental impacts, production challenges, cybersecurity threats, and operational risks at the oil and gas fields.

Furthermore, we discuss two significant political aspects that have been buzzing the energy sector. In our Legal Opinion section, Erica Fauser clarifies the US withdrawal from the Paris Agreement and its implications to the petroleum industry. In our Politics section, the geologist Mahmoud Rashed presents the recent diplomatic crisis involving Qatar, Egypt, and the Gulf countries, and discloses how it has affected Qatar's oil and gas supplies. In this issue, we also provide an overview of Equatorial Guinea's petroleum industry as the country is the newest member of the Organization of Petroleum Exporting Countries (OPEC).

We hope you enjoy reading this issue.

As always, thank you for your support and readership.

inside this issue

EGYPT OIL&GAS NEWSPAPER

EGYPT'S LEADING OIL AND GAS MONTHLY PUBLICATION

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IOCs Start Exploration Program in North El Hammad

French Total, Italian ENI's Egyptian subsidiary IEOC, and UK's BP have started an oil and gas exploration program in the North El Hammad block, which is located in the conventional offshore of the Mediterranean Sea, reported Amwal Al Ghad.

The exploration program aims to explore more fields in the area in order to increase Egypt's oil and natural gas domestic production.

Natural gas and oil exploration programs implemented by international companies encourage foreign investments in the petroleum sector, stated the Egyptian Minister of Petroleum and Mineral Resources, Tarek el-Molla, during his meeting with Total E&P Egypt's Managing Director, Jean-Pascal Clémençon, and Total's Vice President of North Africa Region, Elias Kassis. El Molla pointed out that the projects increase Egypt's reserves and resources of gas in the coming period.

Meanwhile, a press release to Egypt Oil&Gas stated that El Molla pointed out, during the 6th meeting of the higher committee for following up on the second phase of the West Nile Delta projects, that the second phase of the schemes, including North Alexandria and West Mediterranean, is moving along ahead of schedule to start production before the planned time.

This comes as El Molla announced that the Egyptian oil and gas sector has paid total $2.2b to international oil companies (IOCs) in June. The Egyptian arrears for IOCs decreased to be $2.3b, which is the lowest amount of arrears Egypt has since 2013 when the Egyptian debts were $6.3m.

The minister further stated that paying the debts shows that the Ministry of Petroleum and Mineral Resources is committed to the payment schedule and reflects Egypt's credibility in its dealings with IOCs.

In related news, the Central Bank of Egypt's (CBE) Assistant Deputy Governor, Rami Aboul Naga, stated that Egypt paid total $1.5b in arrears to international oil companies (IOCs) in May and June 2017.

FSRU Höegh Gallant Receives 100th LNG Cargo in Ain Sokhna

Norway-based floating liquefied natural gas (LNG) giant, Höegh LNG, said its floating storage and regasification unit (FSRU) Höegh Gallant received the 100th cargo in Ain Sokhna, Egypt, reported LNG World News.

The FSRU entered commercial operation serving as Egypt's import terminal in late April 2015 as the country pushed to secure gas supply and reduce power shortages, informed Energy Egypt.

Höegh Gallant FSRU serves under a five-year charter agreement with the Egyptian Natural Gas Holding Company (EGAS), and in a brief social media statement, Höegh LNG informed the vessel has received the 100th cargo since starting operations as Egypt's import terminal.

The FSRU was built in 2014 by the South Korean shipbuilder Hyundai Heavy Industries. It is capable of storing 170,000 cubic meters of the chilled fuel and has a regasification capacity of 500mcf/d.

Meanwhile, Singapore-based gas shipping giant BW announced that its BW Singapore floating and storage regasification unit (FSRU) has been

relocated to the SUMED port in Egypt to continue its contract with the EGAS, reported Energy Egypt.

In a brief social media statement, BW's LNG unit noted that the relocation of the FSRU, which was a business decision made by EGAS, demonstrates the flexibility to optimize operations for the charterer.

The FSRU so far served as Egypt's second import terminal in the port of Ain Sokhna, starting full operation in October 2015. BW Singapore, serving EGAS under a five-year charter, has a storage capacity in excess of 170,000 cubic meters and a peak regasification capacity of 750mcf/d.

Egypt to Reduce Oil and Gas Imports

An official in the state-run Egypt Natural Gas Holding (EGAS) stated that Egypt will decrease its liquefied natural gas (LNG) imports by 30% in September 2017, reported Amwal Al Ghad.

The official said, "We plan to import 10 shipments per month during June and July and to cut them down to seven per month during September and to five once Zohr field starts production."

In May, Egypt was holding talks with its LNG suppliers to defer contracted shipments in 2016. The North African country aims to cut back on purchases in 2018, as surging domestic gas production squeezes out demand for costly foreign imports.

Moreover, the Egyptian Minister of Petroleum and Mineral Resources, Tarek El Molla, stated to media that Egypt plans to increase petroleum production over the next two years and reduce fuel imports.

According to El Molla, "the Ministry of Petroleum has put forward a plan … to increase the country's production of petroleum products and reduce its reliance on imports to 10% of total consumption by 2019" from the current 30%, as reported by Reuters. The minister pointed out that Egypt consumes 6.8m tons of fuel per month.

The North African country has been trying to reverse that trend speeding up production of oil and gas at recent discoveries. Large natural gas findings are expected to make Cairo self-sufficient in gas by the end of 2018, and the government is now looking to make similar progress in petroleum, informed Al Mal News.

Egypt to Raise up to $150m from Enppi's IPO

Egypt expects to raise up to $150m from the initial public offering (IPO) of the Engineering for the Petroleum & Process Industries (Enppi) as the government pushes ahead with a plan to sell stakes in state-controlled companies. CEO of state-owned investment bank NI Capital, Ashraf Ghazaly, said that managers will be hired for the sale of 22% to 24% of Enppi, according to Amwal Alghad. Ghazaly added that the authorities are also studying selling stakes in companies in oil and gas, chemicals, utilities and shipping, possibly generating billions of dollars. The IPO program has the potential to be very successful, he added.

Egypt Allocates Fuel Subsidies in 2017/2018 Budget

Egypt allocated EGP 145b for fuel subsidies in the budget of fiscal year 2017/2018, reported Arab Finance. Egyptian Prime Minister, Sherif Ismail, stated that the country has set a total subsidy bill of EGP 330b in fiscal year 2017/2018, of which 145b will be for fuel, while EGP 80b will be allocated for electricity, informed Reuters. Ismail told reporters that the EGP 330b figure also included food subsidies. However, the Prime Minister did not say how much exactly would be spent on food. The cost of fuel imports has soared since Egypt floated its pound currency in November 2016, prompting it to halve in value against the dollar within weeks.

El Molla Reviews West Nile Delta Progress

A press release to Egypt Oil&Gas stated that the Minister of Petroleum and Mineral Resources, Tarek El Molla, pointed out that the second phase of the West Nile Delta projects, including North Alexandria project and West Mediterranean project, is moving along ahead of schedule to start production before the planned time. During the meeting, BP's Regional Manager, Hesham Mekawy, said that BP is facing great challenges to put Fayoum and Giza fields on the production map by the end of 2018 at 400mcf/d of gas. The project's onshore gas processing plant, which is under construction, will start production in 2019 with production capacity 350mcf/d of gas.

Sisi: Egypt Aims to Become Europe's Regional Energy Hub

Egypt's President Abdel Fattah El Sisi said on June 12th that Egypt seeks to become a regional and global hub for energy generation, transmission, and distribution to Europe, especially to Germany, reported Amwal Al Ghad. As the president added during the German-Egyptian Economic Forum in Berlin, Egypt will start exporting natural gas in 2020 given the recent major gas finds in the Mediterranean Sea and North Delta. El Sisi, the German Minister for Economic Affairs, Brigitte Zypries, and the Egyptian Minister of Industry and Trade, Tarek Qabil, inaugurated the German-Egyptian Business Forum, on the sidelines of the conference organized between the G20 and African leaders in Berlin.

Egypt Pays $40m in Dues to Dana Gas

Dana Gas announced that it received a $40m payment as part of its outstanding receivables from Egypt. The country has paid a total of $135m in dues to Dana Gas during 2017. The current receivables balance in Egypt stands at $187m.

Dana Gas shares soared on June 7th after the company said it received another payment from the Egyptian government, reducing the arrears owed by nearly 30% so far in 2017, reported The National.

The company has been struggling because of accumulated government arrears in its two main operating areas, the Nile Delta in Egypt and the Kurdish region of Iraq, which has also raised worries about its ability to refinance a $700m sukuk that was due October 2016.

Additionally, the Central Bank of Egypt's (CBE) Assistant Deputy Governor, Rami Aboul Naga, stated that Egypt had paid total $1.5b in arrears to international oil companies (IOCs) in May and June 2017, reported Al Ahram Newspaper.

Abul-Naga said that a payment of $750m had been made few days before his statement, making this the second payment of debts by Egypt in two months as the country paid off $750m of its debt to IOCs last May.

Abul-Naga stressed that Egypt is committed to paying off all its financial obligations, adding that in June 2017 it will pay an installment of $700m to the Paris Club, which is an informal group comprised

of officials from 20 creditor countries that work in cooperation with the International Monetary Fund (IMF).

CBE's Governor, Tarek Amer, had previously stated that the North African country was committed to making a second payment of the same amount in the beginning of June 2017. Prior to the latest payments, Egypt had outstanding dues of about $3.5b to IOCs.

Abul-Naga's statements came following a CBE announcement that foreign reserves have risen to $31.125b at the end of May, nearing pre-2011 reserves, which were estimated at $36b.

MIDOR Increases Refining Capacity

An official at Middle East Oil Refinery (MIDOR) told Al Shorouk News that MIDOR raised its refining capacity by 109% in the 1st quarter of 2017, compared to the same period in 2016. The refinery's capacity reached 3.9m barrels of refined crude.

MIDOR aims to increase its capacity by 15% throughout 2017 to 39m barrels from 33.3m barrels of oil refined in 2016. The refinery's preliminary results showed that the facility produced 150,000 tons of butane and 1.7m tons of diesel in 2016.

The capacity increased is powered by the expansions in MIDOR. According to the official, the expansions started in January 2017.

This comes as the Egyptian Parliament approved the draft law submitted by the government allowing the Ministry of Finance to guarantee MIDOR and Assiut Oil Refining Company (ASORC) their $2.6b fund from the Financial and Insurance Products and Services (Sace), reported Al Wattan News.

The fund is aimed for an expansion project in MIDOR that would increase production by 73% to be 5m tons of diesel and Jet Fuel, 105m tons of benzene,

276,000 tons of butane, 140,000 tons of sulfur, and 276,000 tons of coal. The fund further aims to establish a hydraucracking complex in ASORC, informed Al Bawabh News.

Minister of Finance, Amr El Garhy, pointed out the importance of the two projects in securing petroleum products. El Garhy said, "Our petroleum imports reached EGP 14b per year, which affects the trade balance deficit. The market's consumption of petroleum products ranges between 52 tons to 78 tons. Therefore, these projects are important for refining petroleum and help increase the industry's depth and reach self-sufficiency. The projects' time-frame is going between 3 to 4 years."

DRILLING

BAPETCO

BAPETCO, a joint venture between EGPC and Shell, has completed drilling a new exploratory gas well in its concession area in the Western Desert. The oil production in May 2017 was 1,313,455 barrels.

BED3 C6 S-A

The well was drilled at a depth of 12009ft utilizing the EDC-42 rig. Investments surrounding the project are estimated at $1.696m.

QARUN

QARUN, a joint venture between EGPC and Apache, has completed drilling a new oil development well in its concession area in the Western Desert. The production rate of Qarun in May 2017 was 1,060,842 barrels of oil.

WON X-19

The well was drilled at a depth of 7,250ft utilizing the EDC-63 rig. Investments surrounding the project are estimated at $1.52m.

PETROBEL

PETROBEL, a joint venture company between EGPC and Italian Eni, is drilling new development wells in its concession area in the Mediterranean. The production rate of PETROBEL in May 2017 was 2,719,070 barrels of oil.

ARM-W-09-H

The well was drilled at a depth of 13724ft utilizing the EDC-55 rig. Investments surrounding the project are estimated at $5.069m.

113-140 ST-1

The well was drilled at a depth of 9747ft utilizing the ST-3 rig. Investments surrounding the project are estimated at $1.35m.

Shell

Shell, a British–Dutch multinational oil and gas company, has completed drilling a new oil exploratory well in its concession area in the Western Desert.

NM BABAZ-1

The well was drilled at a depth of 19557ft utilizing the EDC-52 rig. Investments surrounding the project are estimated at $7.347m.

KHALDA

KHALDA, a joint venture between EGPC and Apache, has completed drilling new oil development wells in its concession area in the Western Desert. The production rate of Khalda in May 2017 was 4,513,668 barrels of oil.

PTAH-16

The well was drilled at a depth of 12850ft utilizing the EDC-11 rig. Investments surrounding the project are estimated at $1.223m.

W.KAL-A19

The well was drilled at a depth of 10850ft utilizing the EDC-17 rig. Investments surrounding the project are estimated at $1.55m.

NRZK-28

The well was drilled at a depth of 13000ft utilizing the EDC-47 rig. Investments surrounding the project are estimated at $1.685m.

GUPCO

GUPCO, a joint venture company between EGPC and BP, has completed drilling a new crude oil development well in its concession area in the Gulf of Suez. The production rate of GUPCO in May 2017 was 2,309,491barrels of oil.

GS 311-2 ST

The well was drilled at a depth of 105340ft utilizing the BAHRI-1 rig. Investments surrounding the project are estimated at $2.402m.

GPC

GPC, a state owned company, has completed drilling new crude oil development wells in its concession area in the Western Desert. The production rate of GPC in December 2016 was 1,446,471 barrels of oil.

SWS-57

The well was drilled at a depth of 8127ft utilizing the EDC-16 rig. Investments surrounding the project are estimated at $1.5m.

N.E.S-4

The well was drilled at a depth of 8235ft utilizing the TANMIA-1 rig. Investments surrounding the project are estimated at $1.6m.

Petrosilah

Petrosilah, a joint venture company between EGPC and MERLON, has completed drilling a new development well in its concession area in the Western Desert. The production rate of Petrosilah in May 2017 was 251,851 barrels of oil.

N.Silah 1-2 ST-1

The well was drilled at a depth of 8500ft utilizing the ECDC-1 rig. Investments surrounding the project are estimated at $1.126m.

Petrofac Inks Agreement with Kuwait Oil Company

Petrofac has agreed a five-year relationship with Kuwait Oil Company (KOC) for the provision of specialist technical training and competency development services. The contract, which is valued at more than $35m, was secured following a competitive tendering process and is effective immediately, according to Petrofac's press release.

The work will be undertaken within Kuwait by the Training Services team who form part of Petrofac's Engineering & Production Services division.

Petrofac's Vice President, Training Services, Engineering & Production Services, East, Karim Osseiran, said, "This is a highly innovative, long-term project. A team of more than 30 training professionals and technical specialists from Petrofac will be embedded within KOC's operations to deliver skills and competency-based learning and development services at the frontline of production operations," Your Oil and Gas reported.

Osseiran further stated, "The award clearly demonstrates KOC's commitment to its people and the importance it places on the development of competency and skills within its workforce. This project will build legacy value through the development of systems and processes to operationalize human capability development where it matters the most, in the field."

Additionally, Petrofac has secured a long-term Framework Agreement (FA) with Petroleum Development Oman (PDO) for the provision of Engineering, Procurement and Construction Management (EPCM) Support Services for major oil and gas projects according to Petrofac's press release.

The ten-year agreement, which has an additional five-year option, builds upon a three-year program of EPCM support contract delivery that Petrofac has undertaken on behalf of PDO. Future projects undertaken through the FA will be supported by Petrofac's Muscat office for technical delivery and to ensure sustainable in-country value is generated.

Petrofac's Group Managing Director of Engineering and Production Services, Craig Muir, said, "This is a landmark agreement between our two companies and marks a new level of collaboration between PDO and Petrofac. It builds upon a long-standing relationship which spans more than two decades and encompasses a significant number of projects undertaken in Oman on both a lump-sum and reimbursable basis."

"Our priority will be to deliver quality oil and gas facilities that are technically robust, with an absolute focus on safety and in-country value", he added, according to The National.

Rosneft to Explore and Develop Fields in Iraq's Kurdistan

Russia's Rosneft agreed to explore and develop five fields in Iraq's Kurdistan as it seeks to become a key player in one of the world's newest and fastest growing oil provinces, according to Reuters.

Rosneft's CEO, Igor Sechin, said, "The agreement sets an example of a well weighed investment in one of the key Middle Eastern regions, which will make it possible for the company to expand its production and exploration geography, provide feed-stock for Rosneft growing refining network and to raise profitability of our international assets".

Moreover, Rosneft will get access to a major regional transportation system with the capacity of 700,000b/d, the company said. It is planned to expand capacity to more than 1mb/d by the end of 2017, RT News Network informed.

Rosneft'a Spokesman, Mikhail Leontyev, said, "It is a fairly large supply contract on favorable terms for Rosneft. As a result, we get access to a large pipeline that goes from Kurdistan to Turkey. It's a contract for 20 years."

Meanwhile, Iraq's oil ministry has authorized the establishment of a $5b oil refinery project in Kurdistan's Kirkuk.

The Oil Ministry's Spokesman, Asim Jihad, told Rudaw Media Network that "the oil ministry has given approval for a new refinery to be built in Kirkuk." He added that "the project will be implemented in the future."

Additionally, Rebwar Taha, from the Patriotic Union of Kurdistan (PUK) party, stated that the project will be carried out in phases and could take between 3 and 5 years to reach completion, reported Oil Price News.

Qatar Petroleum Operations Remains Stable

Qatar Petroleum (QP), state-run energy firm, said it is carrying out normal operations despite the land, sea and air disruptions after neighboring countries Saudi Arabia, United Arab Emirates and Bahrain severed diplomatic and trade ties with the world's largest liquefied natural gas (LNG) producer and exporter, according to Pipeline.

QP's President and CEO, Saad Sherida Al-Kaabi, said, "On behalf of Qatar Petroleum and our operating ventures, I would like to express our gratitude to all our valued customers, and in particular our LNG customers, and would like to assure them of our determined efforts to continue uninterrupted supplies as the world's most reliable LNG supplier."

It is worth noting that, more than a third of the world's LNG trade comes from Qatar, making it the world's largest producer and exporter of LNG. Countries across the world, including Japan, China, Pakistan, the UK, France, Turkey, Brazil and Argentina rely on the state-run corporation for much of their energy needs, ABC News stated.

Additionally, Qatar can still access shipping routes to deliver oil and gas to buyers after Saudi Arabia and other neighboring states barred the emirate from exporting through their territorial waters, according to Bloomberg

The escalation of tensions in the energy-rich Persian Gulf probably won't disrupt LNG supplies to Qatar's main customers in Asia, according to Dubai-based consultant Qamar Energy's Head, Robin Mills. "In principle Qatar should still be able to export via its own waters, Iran and Oman," Mills said.

Libya's Largest Oil Field Reopened

Libya's largest oil field, Sharara, has resumed production after workers had shuttered the 270,000b/d field. The field is expected to return to its usual output within few days, Oil Price informed. The announcement that production was restarting at Sharara followed an emergency meeting of the National Oil Corporation's (NOC) board and Sharara's operating company, in which NOC' Chairman, Mustafa Sanalla, ordered a review of ambulance services and an upgrading of medical provisions for employees, according to an earlier NOC statement, Reuters stated. Sharara was producing nearly a third of Libya's national output of 835,000b/d earlier.

Eni Acquires Block Off-shore Oman

Italian oil major Eni has acquired rights over the only maritime block offered during the Oman's latest licensing round that was launched in late 2016. The transaction came as a considerable fillip to Muscat's long-standing efforts to find and develop offshore oil and gas reserves, Your Industry News reported. According to Arabian Oil and Gas, the allocation was made in the context of a broader co-operation agreement with state-owned Oman Oil Company (OOC). It coheres with the broader strategy of enlisting the assistance of IOCs to partner the parastatal's upstream arm in enhancing undeveloped acreage across the sultanate.

Aramco Aims to Invest Globally in Gas and LNG

The Saudi Minister of Energy, Industry and Mineral Resources, Khalid Al-Falih, stated that Saudi Aramco aims to invest globally in production of gas and liquefied natural gas (LNG) after holding its initial public offering (IPO), reported Arabian Oil and Gas. The minister, who was addressing the 21st St. Petersburg International Economic Forum (SPIEF), pointed out the key role played by new technologies in speeding up the diversification of energy sources and minimizing the current risks on climate, Zawaya stated. The Saudi minister further said that members of the Organization of Petroleum Exporting Countries (OPEC) and non-OPEC members will study the possibility of increasing reduction rates in their meeting in November.

Iraq to Boost Production of Southern Oil Field

Iraq will increase its oil production from one of its oldest oil fields in the south by 20,000b/d. Deputy Petroleum Minister for Exploration and Production, Karim Hattab, said that production capacity from the Leheils field in southern Iraq will be raised from 100,000b/d to 120,000b/d, according to Iraqi News. In addition, Hattab said the Leheis oil field, which was discovered in 1961, remained one of the country's promising resources, and supports the national electricity grid with 35mcf/d. Furthermoew, Iraqi Cabinet Spokesperson, Saad al-Hadithi, stated that Iraq wants the production cuts to extend for nine extra months to offset oversupply and enhance prices.

Sound Energy Establishes News Exploration Program

The British oil and gas company Sound Energy kicked off a new program at Sidi Moktar project in Morocco, where it is re-entering the Koba-1 well. The operation is expected to last about ten days and will include the perforation and the testing of the lower Liassic and a potential testing of the Argovian, according to Morocco World News. In addition, Sound Energy highlighted that Sidi Moktar area, which spans 2,700 square km, is located close to gas demand and infrastructure, which includes a large-scale phosphate plant owned by the Moroccan state, Proactive Investors stated.

Gazprom Neft, OMV Sign MoU

Russia's Gazprom Neft and Austria's OMV signed a memorandum of understanding (MoU) for working together on Iran's oil and gas projects. Cooperation includes analysis, assessment and study of certain oil deposits located in the territory of the Islamic Republic of Iran in partnership with the National Iranian Oil Company (NIOC), Pipeline informed.

Gazprom Neft's First Deputy General Director, Vadim Yakovlev, stated that "the Middle East is one of the priority regions in the long-term development strategy of Gazprom Neft."

According to OMV's press release, Yakovlev further noted, "Our Company is developing a large project on the Badra field in Iraq, continuing geological exploration in the Kurdish Autonomous Region of this country and it is studying the possibility of participating in the development of two blocks in Iran. According the extensive experience of OMV in the Middle East and in Iran, joint geological assessment of blocks will be most effective."

OMV's Executive Board Member, Upstream, Johann Pleininger, said, "Russia is developing as OMV's new core area in the upstream business and we can look back on a long-lasting partnership with the country and with Russian oil and gas companies. It fits into our upstream strategy to link the activities and partnerships in Russia with possible new opportunities for OMV in the Middle East."

Meanwhile, Iranian Minister of Petroleum, Bijan Zangeneh, announced that Iran will sign its first oil deal based on the newly devised contract terms before the end of President Rouhani's first term by July, reported Shana News.

Zangeneh stated that the invitation to tender for the development of the Azadegan Oilfield has already started, as informed on United Press International (UPI).

The National Iranian Oil Company (NIOC) has signed several memoranda of understanding (MoUs) with a number of leading energy companies like Total, Royal Dutch Shell and Inpex for carrying out studies on the field's development.

South Azadegan Oilfield is one of Iran's biggest oil reserves and produces heavy crude.

Saudi Aramco Raises Crude Prices to Asia, USA, Northwest Europe

Saudi Arabia, the world's largest oil exporter, raised pricing for July sales of all crude grades to Asia, the USA, and Northwest Europe as it seeks to take advantage of increased demand after suppliers extended production cuts to help curb a global glut, according to Bloomberg. In addition, Saudi Aramco, increased official pricing for Arab Light crude to Asia by $0.6 to $0.25 a barrel, less than the regional benchmark. The company had been expected to increase the grade's pricing by $0.30 a barrel for buyers in its largest market. Aramco boosted pricing due to higher demand and better profits for refiners in the region.

Saudi Oil Exports Declines in Summer

Saudi Arabia's crude exports are expected to fall below 7mb/d this summer. Saudi Energy Minister, Khalid al-Falih, said in May shipments were set to drop from June, particularly to the United States, as the top producer of the OPEC countries aims to limit supply to help balance market, reported Reuters. Exports in May 2017, when the kingdom's total production was 9.880mb/d, averaged below 7mb/d, three industry and shipping sources told Reuters. Early indications suggest that remains the case this month. Meanwhile, a report released by MEED stated that Saudi Arabia has the biggest slice of unawarded projects worth $250b across the entire Gulf Cooperation Council (GCC), according to Arab News.

IOCs to Develop Iranian Fields as the Country Boost Exports

International Oil Companies (IOCs) have presented technical surveys for the development of the Azadegan oil field, according to Pipeline.

Iran is looking to ramp up its crude output with 37b barrels of oil. Production is currently around 80,000b/d from Azadegan, which is Iran's largest field, shared with its neighbor Iraq and part of a string of oil fields in the West Karoun block in the southern oil-rich Khuzestan Province. The block includes North Azadegan, Yaran, Yadavaran and Darkhoveyn fields, holding an estimated 67b barrels of oil in place.

Iran's Petroleum Engineering and Development Company's (PEDEC) CEO, Noureddine Shahnazizadeh, said, "France's Total, Japan's Inpex and Malaysia's Petronas have submitted their findings along with development proposals for the giant South Azadegan field," Financial Tribune informed.

Shahnazizadeh added that some other companies like Royal Dutch Shell, Italy's Eni, and China National Petroleum Corporation (CNPC) are also interested in the tender for development of the oil field.

Meanwhile, Iran's oil exports to the West surged in May to their highest level since the lifting of sanctions in early 2016 and almost caught up with volumes exported to Asia, according to Reuters.

Iran, which used to be OPEC's second biggest oil exporter, has been raising output since 2016 to recoup market share lost to regional rivals including Saudi Arabia and Iraq.

In May, Iran exported around 1.1mb/d to Europe including Turkey, almost reaching pre-sanction levels and only slightly below the 1.2mb/d supplied to Asia, The Times of India stated.

Saudi Aramco Awards New Contracts

The UK's Amec Foster Wheeler has won a five-year contract to provide design and project management for the expansion of Saudi Aramco's Marjan offshore oilfield. In addition, Amec Foster Wheeler will deliver engineering and design, overall program management and other support services for a new gas-oil separation train, which will boost production by 300,000b/d, according to Reuters.

Amec will also offer the same services for a new gas processing plant, and a co-generation facility, in addition to adding a natural gas liquids (NGL) fractionation capacity to an existing facility. The company did not give the value of the contract, the cost of the work involved nor the amount of gas capacity being added.

Amec Foster Wheeler's President of Upstream Capital Projects, Nick Shorten, said, "This latest award for this major oilfield expansion program is a real vote of confidence in our technical expertise and our ability to deliver large and complex projects, plus our long-term commitment to local development.", Pipeline informed.

Additionally, Emerson signed a Memorandum of Understanding (MoU) with Saudi Aramco during the recently held Saudi-US CEO Forum in Riyadh. The agreement signed by Emerson's CEO, David N. Farr, and Saudi Aramco President and CEO, Amin H. Nasser, will help bring advanced digitization and automation technologies to one of the leading energy and chemicals companies, according to Emerson's press release.

Farr stated, "This collaboration will aid in strengthening the digital transformation of Saudi Aramco," adding that "more doors will be opened for developing talent and training our workforce across the Kingdom," Pipeline informed.

EDISON TO PARTNER IN DRILLING AT NORTH EAST HAPY CONCESSION

An Official at the Egyptian Natural Gas Holding Company (EGAS) told Al Shorouk Newspaper that Italian Edison is seeking a partner to begin drilling the first deepwater well at its North East Hapy offshore concession.

Edison is searching for a partner as the drilling costs could exceed $100m.

The Minister of Petroleum and Mineral Resources, Tare El Molla, had signed an agreement between EGAS and Edison in January for exploration and production with investments of more than $86m and a $1.5m signing bonus.

The agreement includes searching for oil and gas in North Hapy and drilling two new wells. Edison performed seismic survey on the concession early 2017.

In related news, Edison had achieved a new significant milestone in Abu Qir Concession offshore Egypt starting gas production from the new platform North Abu Qir PIII (NA/Q-PIII). The first production well, NAQPIII#1, was turned on stream with outstanding performances on early April, increasing the overall gas output of the field by 20%. Two additional wells are expected to be completed within July 2017 boosting significantly the Abu Qir Field production.

BP AWARDED ADD ENERGY A CONTRACT IN EGYPT

Add Energy, the international energy consultancy provider, has been awarded a maintenance build contract worth around $1.8m with BP for work on West Nile Delta, located just off the north coast of Egypt, reported Scandinavian Oil-Gas Magazine.

The contract will see Add Energy carry out the development of a full asset maintenance build and will include the delivery of an asset register and functional hierarchy build, equipment criticality assignment, development of maintenance strategies for critical and non-critical equipment, job plans and procedures, critical sparing and BoMs development, informed Africa Business Communities News.

The Add Energy project team will be operating from Aberdeen and will require the project manager and principal consultant to travel to the BP West Nile Delta project offices in London over the course of the 18 months project.

As part of Add Energy's commitment to the scheme, the energy consultancy has appointed Dr. Damon Bowler to oversee the project. With over 25 years of asset management experience, Bowler has worked in the oil and gas industry in various roles, and has a diverse range of technical, business, and management skills.

UTEC WINS CONTRACT AT ZOHR

Italian oilfield contractor Saipem has awarded UTEC, a global survey company in subsea services group Acteon, a contract to support Saipem's operation for Egypt's deepwater Zohr gas field development project in the Mediterranean Sea, reported Oil Review Africa.

UTEC announced that it will work with Saipem in performing surface positioning on-board its operated barges, Bautino and Castoro 10, and associated Anchor Handling Vehicles (AHVs), informed Trade Arabia.

As per the contract, the company will also provide trenching support, including trench monitoring services and as-trenched surveys utilizing UTEC's Teledyne Gavia Autonomous Underwater Vehicles (AUVs) in water depths ranging from 2.5 to 20 meters. The contract is expected to last around five months.

UTEC's Director of Business Unit for Europe and Africa, Cory Goodyear, stated, "UTEC has built up a strong relationship with Saipem utilising AUV solutions in Africa, and we look forward to continuing our close working relationship to remain at the forefront of emerging technology and ensure that all of our customers continue to receive world-class service and solutions."

PETROJET COMPLETES CONSTRUCTION OF ZOHR FACILITY

The Petroleum Projects and Technical Consultations Company (Petrojet) completed the construction of deepwater subsea structures on the Zohr gas field one month ahead of schedule, reported Al Masry Al Youm. Petrojt received a thanks letter from Saipem Egypt pointing out Petrojet's success in installing the facilities ahead of schedule, using remotely controlled devices, 215 km away from Port Said shore on 1500-meter depth. The first phase of the project included suction piles and element from HIPPS, the chief controller of the offshore wells, and UTA, which is responsible for receiving main control lines in Zohr field.

ECHO ENERGY SELLS STAKE TO PARTNER NOSTRA TERRA

Echo Energy stated that it has sold its 25% interest in Egyptian East Ghazalat license to Nostra Terra, for $500,000, with an initial $100,000 paid once a regulatory approval comes from the Egyptian General Petroleum Corporation (EGPC), Proactive Investors informed. The remaining $400,000 are planned to be paid in two tranches. One tranche is triggered when the concession yields production of 800b/d of oil for 30 consecutive days, and the other tranche will be settled when the output reaches 1,000b/d for 30 straight days. East Ghazalat concession is located in the Western Desert, around 300 km west of Cairo. Vegas Oil&Gas and TransGlobe Energy discovered Safwa oil field in 2010.

ADES OFFERS 40% STAKE IN LONDON STOCK MARKET

Advanced Energy Systems (ADES Group) completed offering 40% of its shares on London Stock Exchange at a price of $16.50 per share, with total proceeds of $278m, reported Al Mal News. The floatation is managed by EFG-Hermes and Citi Group with Baker McKenzie acting as the legal advisor. ADES, owned by businessman Mamdouh Abbas, raised its capital to $42.203m from $31.9m by offering 10.303m shares with a nominal value of $1 per share, bringing the total number of shares after increase to 42.203m shares. After boosting capital, the firm put in a 40% stake amounting to 16881m shares with total proceeds of $278m.

AQUATERRA INSTALLS PICO'S OFFSHORE PLATFORM IN EGYPT

Aquaterra Energy, a global offshore engineering solutions provider, completed the installment of a new Sea Swift platform at the Amal field offshore Egypt, reported Pipeline Magazine.

The client was PICO Petroleum Integrated Services, lead contractor for the development of Amal Petroleum Company's (AMAPETCO) Amal field in Gulf of Suez, informed Offshore Magazine.

The Sea Swift is a conductor supported platform (CSP) installed in 23 meters of water, featuring 385 metric ton topsides with a helideck and emergency accommodation and provision for six wells.

According to Aquaterra, the scope of work included designing the process, piping, electrical, instrumentation, control system and technical safety features, and design of the new subsea production pipelines to the Amal-A platform.

The project, which took 18 months from design to installation, also involved erecting a bridge link to the neighboring Amal-B platform and reconfiguring the topsides pipework to create a new and improved production profile.

Benefits of Sea Swift system include reduced platform costs, lower installation and intervention costs, and simplified project management. In addition, the designs allow wells to be drilled, completed with dry trees, and installed before the arrival of the main processing platform.

IPR PROCEEDS WITH EXPLORATION PROGRAM IN EGYPT

IPR Incorporation reported continued drilling success and a series of Western Desert and Nile Delta discoveries through the first 5 months of 2017, reported Energy Egypt. IPR's calendar year drilling program in Egypt budgeted for the drilling of 23 wells, making 2017 one of the most active years operationally for IPR since its 1993 acquisition of the Phillips Petroleum Western Desert assets. The program includes onshore exploration, appraisal, and development drilling, and work-overs offshore in the Gulf of Suez. IPR's North Ras Qattara concession in the Western Desert saw success from NRQ-11X and appraisal well NRQ-9-2.

IPR ENERGY GROUP

South Sudan to Produce 350,000b/d by Mid-2018

South Sudan Petroleum Minister announced that the country is planning to drill 30 new wells in 2017 and significantly enhance its oil output as it chases a peak 350,000b/d target by mid-2018, Reuters stated.

South Sudan, which is considered to be East Africa's only mature oil producer, has been seeking new investments in order to develop its oil sector, where output has been limited to 130,000b/d due to the local security challenges, Citizen informed.

Petroleum Minister Ezekiel Lol Gatkuoth told journalists on the sidelines of an African oil conference in Cape Town, "We are estimating by the end of the year we will reach 200,000b/d. We will make sure it reaches what it used to be."

The nation, which seceded from Sudan in 2011 and plunged into civil war just over two years later, aimed to more than double output in the financial year starting in July, although the unrest at land-locked South Sudan can still disturb the plans of the world's youngest country.

Additionally, Gatkuoth told delegates that the country intended to increase its refinery capacity to supply fuel to neighboring countries. "We are focusing on four or five refineries so we can finally be able to sell to Ethiopia, Sudan, Kenya, and Uganda," he said.

Gatkuoth stated that the country's first refinery, a 10,000b/d Russian-built plant in the Upper Nile region, was expected to start operating in August. Other refineries under consideration include a 60,000b/d plant close to the Ethiopian border, as well as a 50,000b/d in the oil-producing region of Paluch.

Meanwhile, the East African country will also resume stalled negotiations with Tullow Oil and Total over Block B1 and B2 after stopping direct talks in April due to "irreconcilable differences", Kitco informed.

Blocks B1 and B2 used to be part of the 120,000 square kilometer area known as Block B, which was divided into three licenses in 2012 and is considered to be rich in hydrocarbons, although only few drilling operations were done there.

Total also signed a cooperation agreement with Petrosen and Senegal's Ministry of Energy and Renewable Energy Development under which Total will perform studies to assess the exploration potential of Senegal's ultra-deep offshore and become operator of an exploration block.

Total Still Interested in South Sudan's Blocks B1 and B2

South Sudan's Petroleum Minister revealed that Total SA contacted South Sudan about developing two of its biggest oil blocks after previous talks on the fields failed, Bloomberg reported. "They have written to me that they are still interested in blocks B1 and B2," Petroleum Minister, Ezekiel Lol Gatkuoth, said in an interview in Cape Town. He added that Tullow Oil Plc has also asked to discuss the blocks, Rigzone informed. Discussions with Total on blocks B1 and B2 reached an impasse in April, prompting the country to open negotiations to new investors. The blocks are part of the former Block B, which the government says is the nation's largest untapped oil deposit.

Sirius Petroleum, BP Discuss over Ororo Funding

Sirius Petroleum announced that it is in talks with BP over the financing of the development of the Ororo field, Offshore Nigeria, Ecofin Agency reported. According to the company, the discussion involves an offtake and pre-payment facility to support the financing of its planned drilling program on the field, Offshore Energy Today stated. "Discussions with BP and other parties regarding financing are ongoing and there can be no certainty that Sirius will reach an agreement with BP regarding the proposed offtake and pre-payment," Serious Petroleum confirmed. At Ororo, Sirius is a partner in a consortium alongside COSL Pan Pacific Drilling, Add Energy, and Schlumberger.

ENI to launch Production from Ghana's Sankofa Field

months ahead of schedule.

According to Seeking Alpha, the Sankofa field, which will pump 45,000b/d, is in phase one of the $7.9b Offshore Cape Three Points (OCTP) project that will also produce up to 180mcf/d of gas from nearby Gye Nyame reserve by the end of 2018.

The company said in a statement emailed to Reuters, "ENI has launched production from the integrated oil and gas development project in the OCTP block, off Ghana's western coast, in just two and half years, and three months ahead of schedule."

OCTP is expected to more than double domestic gas supply and help restore rapid economic growth in Ghana.

ENI holds a 44.44% stake in OCTP, representing the largest foreign direct investment in Ghana's history. Upstream trader Vitol holds a 35.56% stake, while state oil company Ghana National Petroleum Corporation (GNPC) has a combined carried and participating interest of 20%.

A senior GNPC official stated that the project could raise Ghana's oil output to around 200,000b/d and gas production to more than 300mcf.

"We have started production, but not officially … It marks the beginning of Ghana's journey towards petroleum-driven sustained economic growth," the official said.

The OCTP integrated oil and gas development is made up of the Sankofa Main, Sankofa East and Gye-Nyame fields, which are located about 60 km off Ghana's Western Region coast. The fields hold about 770m barrels of oil in place. The project further includes the development of gas fields from which the production will be utilized entirely by Ghana's domestic market.

Equatorial Guinea, ExxonMobil Sign Production-Sharing Deal

Equatorial Guinea's Hydrocarbons Ministry announced that US oil major ExxonMobil has signed a production-sharing contract with Equatorial Guinea for offshore block EG-11, Reuters reported.

Equatorial Guinea's Minister of Mines and Hydrocarbons, Gabriel Obiang, said, "Block EG-11 is the jewel among a group of already very prospective blocks that we are signing in 2017."

According to Oil Price, during the Africa Oil & Power 2017 Conference in Cape Town, Equatorial Guinea announced that the new contract was signed through direct negotiation, and was not part of the EG Ronda 2016 licensing round.

The production-sharing contract with ExxonMobil is for a block next to the Zafiro field, operated by the company. ExxonMobil has a 71% interest in the Zafiro field, whose net production averaged 31,000b/d in 2016, the US group said in its 2016 financial and operating review.

In addition, the firm holds an 80% interest in Block EG-06, on which nearly 600 square miles of 3D seismic data were acquired in 2015. Technical evaluation is under way, ExxonMobil said.

In related news, Equatorial Guinea's Minister of Mines and Hydrocarbons, Gabriel Mbaga Obiang Lima, announced the seven winners of the EG Ronda 2016 Licensing Round at the Africa Oil & Power conference, one year after its launching, Petroleum Africa reported.

Ophir Energy was the winning bidder for Block EG-24, Offshore Equator plc gained access to Block EG-23, Clontarf Energy was awarded Block EG-18, Elenilto won EG-09, Taleveras was awarded EG-07, and Atlas Petroleum and Strategic Fuel Fund gained access to EG-10.

EQUATORIAL GUINEA: THE NEWEST OPEC MEMBER

By Samar Samir

Equatorial Guinea joined in May the Organization of Petroleum Exporting Countries (OPEC). The numbers of oil production and revenues, the country's location, and the prosperous prospects of being OPEC's newest member grant the country key aspects to turn Equatorial Guinea into an open door to investments in the petroleum sector.

The nation is the third largest oil producer in sub-Saharan Africa with reserves estimated at 1.1 billion barrel of oil in 2015. In the same year, its oil production was estimated at 289,000 barrels per day. The significant reserves led Equatorial Guinea's oil and gas industry to become a main factor in the national economy, which was previously based on agriculture.

The sector, however, despite seeing some increase in investment, did not receive a significant boom due to the lack of fair economic environment. As much as three-quarters of the country's population lives in poverty, and the government has been widely criticized for its unfair distribution of oil revenues. As such, building up a panorama of the country's future prospects requires firstly to know the main factors that pull the petroleum industry together in the nation along with the risks that resolve its investments.

OPEC Triumph

During an OPEC meeting held in May in Vienna, Equatorial Guinea was announced the fourteenth member of OPEC. The country's Minister of Mines and Hydrocarbons, Gabriel Mbaga Obiang Lima, stated that Equatorial Guinea's participation in the cartel is a triumph.

He said, "This is a proud moment for us. There has never been a more important time to stand together, and it is our honor to stand with OPEC as a positive force in global energy. We will use this platform to advance the interests of all African oil and gas explorers and producers and all OPEC members."

In line with the Organization's target to cut oil supplies and rebalance barrel prices, Equatorial Guinea pledged to cut its crude output by 12,000 barrels per day from its production in 2017.

Investing Opportunities and Risks

Besides being part of OPEC, the discovery of offshore concessions also attracted some investors who seek profiting from oil and gas. The Standard Trade Portal informed that "foreign direct investment (FDI) inflows into the country have thus been consistently high - around $2 billion - for the past years. In 2014, FDI inflows amounted to $ 1.9 billion."

Furthermore, the government has worked on new facilitations to attract investors. It has offered variable taxes and continued to sign new partnerships for works in the oil and gas sector. The United States is the main investing country, followed by China and France.

However, the lack of fair economic environment has at the same time discouraged some investors from injecting their projects in the country. According to 2016 Doing Business report published by the World Bank, "Equatorial Guinea ranked 180th out of 189 countries" in foreign investments. This low rank affects investors' decision toward the oil and gas sector badly.

Corruption and lack of transparency are also major obstacles that draw back the growth of the industry. According to the Resource Governance Index, the nation had a falling score of 14 in business' transparency. "Some information on the licensing process is available before and after negotiations, but contracts are not published," reported the Natural Resource Governance Institute, adding that the government does not publish exact information about revenues.

Additionally, Equatorial Guinea has a low score in safeguards and quality control as there is no evidence that the government checks those controls or monitors the contracts. Thus, conducting business in the country represents some risks, which any prosperous economy is trying to avoid.

With their large oil and gas production rates, the nation has been one of the largest exporters in Africa. The high production is certainly leading existing fields to mature and the unstable environment that pushes investors away impose an enormous roadblock to new discoveries.

Exports and Production of Main Fields

The oil and gas that drives the Equatoguinean economy comes from three main fields: Alba, Ceiba, and Zafiro, all of which are located offshore.

As reported by African Business Magazine, until the new millennium, the government did not make the best use of hydrocarbon reserves in deep-water areas because of the high cost of exploration and the lack of technology. However, the country has mitigated these obstacles by using floating production storage and offloading (FPSO), which paved the way for some discoveries in the Guinean gulf.

The African nation counted with a production of only 5,000 barrels per day in 1995, but it highly increased after using FPSO in their biggest field, Zafiro. The Equatoguinean Ministry of Mines, Industry and Energy reported that the Estimated Ultimate Recovery (EUR) from the Zafiro field is 1.199 billion barrels.

The field produces oil and gas, which are separated after extraction. The state manages 20% stakes in the field and its production sharing contracts is managed by the state oil company GE Petrol. As expected, Zafiro's production is currently decreasing as the field matures.

According to the ministry, Ceiba field compromises 16 producing wells and 12 water injector wells. The field reached its peak production of 72,000 barrels per day in 2001. Yet, as Zafiro field, it faced a decrease in output to 19,400 barrels per day.

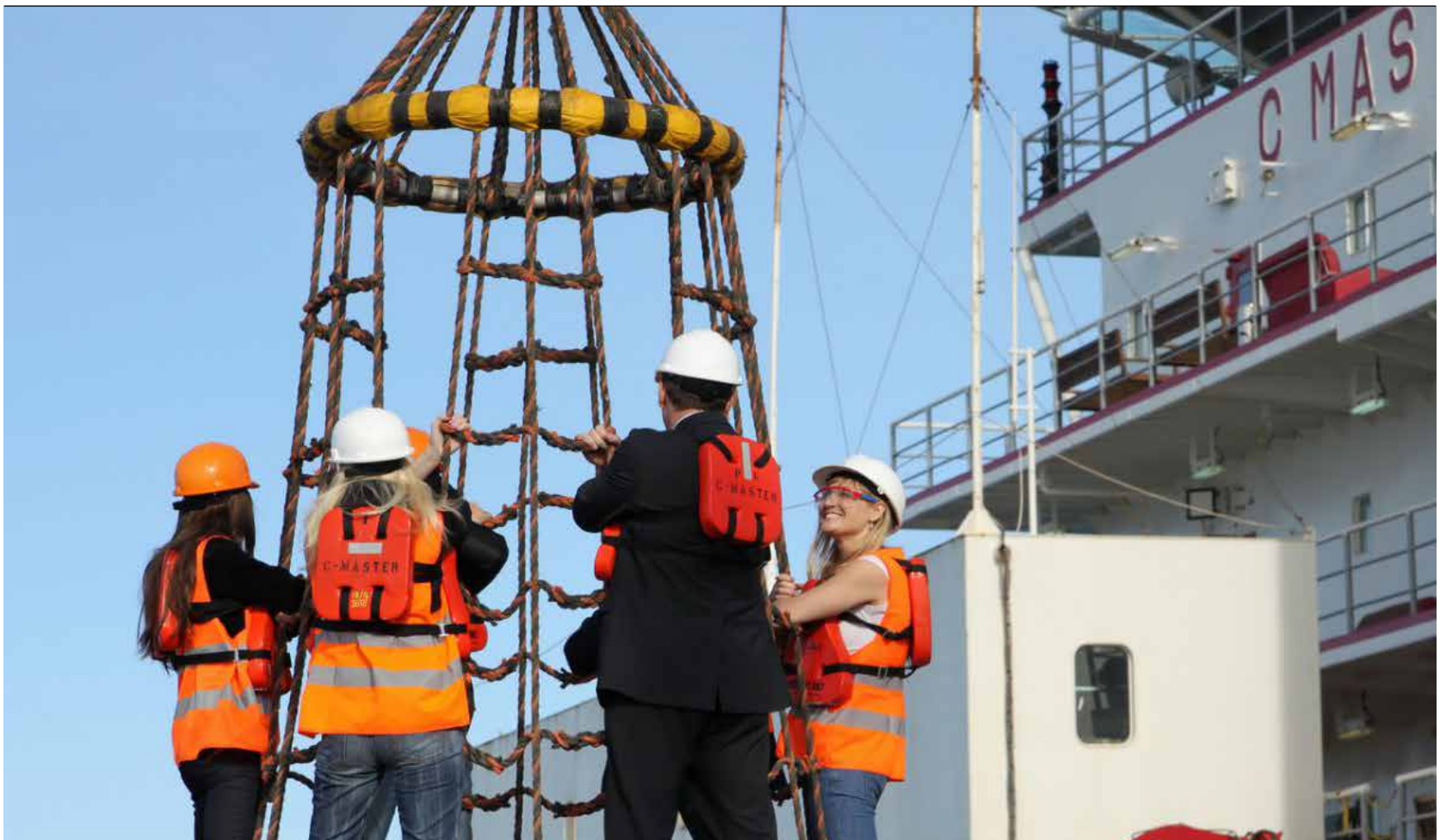
The third main field is Alba and it is the largest gas field in Equatorial Guinea with gas reserves estimated at five trillion cubic feet. In 2001, the field produced 195 million cubic feet per day. As reported in the ministry's official website, after Marthon oil, an American oil corporation, acquired CMS interests in Equatorial Guinea, it expanded oil and gas production and provided gas handling facilities that enabled gas production in Alba to increased to reach 850 million cubic field per day in 2011.

Overall, according to African Business Magazine, "since national output reached 380,000 barrels per day of crude oil and condensates in 2008, it has fallen slightly since then and will decline gradually from now on unless new discoveries are made to supplement proven reserves of 1.1 billion barrels."

Although the decline in oil production due to mature fields is still not drastic, Equatorial Guinea needs more discoveries to preserve their status as being one of the largest oil producers and exporters. It is also necessary to have more discoveries as the country's economy is reliable on oil and gas revenues.

Uncertain Future

The development of the oil and gas sector has full potential of changing the country into one of the leading countries in the region, but it depends on how Equatorial Guinea is going to deal with its reserves and how it would beat the obstacles that make it seem as an undesirable market.



QHSE: A VISION FOR BORG EL ARAB PETROLEUM

In the oil and gas industry, quality, health, safety, and environment (QHSE) are key aspects for operators to ensure the productivity of their fields. Following a QHSE program, oil and gas firms get the most beneficial performance and results.

Borg El Arab Petroleum Company, one of the companies working in exploration, drilling and production under the umbrella of the Egyptian General Petroleum Corporation (EGPC), believes that the best performance gives the best benefits for people, production and environment. Therefore, the company seeks to boost its performance considering that QHSE is the responsibility of everyone.

The firm's higher management guidance made the company commit to the requirements of QHSE through the company's QHSE management system that meets laws and regulations.

Safety Measures

Borg El Arab Petroleum Company follows certain measures in order to maintain QHSE in its performance. The company gives priority to QHSE issues in decisions making, scientific planning and in securing all the requirements needed to maintain QHSE. It holds periodic meetings to set the company's targets and ensures the compatibility between the QHSE standards and the company's goals. Borg El Arab keeps the communication between employees and QHSE contributors to spread awareness of possible dangers in workplace between employees and to supply employees with tools and information related to the risks they may encounter in the workplace.

Furthermore, the company is always assessing its program and seeks improving it in order for QHSE performance to meet set goals. The firm includes workers in danger cards and notes system that aim to have a shared vision that safety is every person's responsibility and to be able to discover hidden dangers and accidents that may occur in order to take the correct measures to prevent these accidents. It also installs devices to detect smoke and fires, implements firefighting manual systems using foam, chemical powders, and water , as well as automatic firefighting systems in power plants and offices based on the most suitable system for the workplace.

The company keeps full coordination with the geographical committee and other oil and gas firms in order to implement an emergency plan in the Western Desert. It attends the geographical committee meetings which are very important to learn about the experience of other oil and gas firms, cooperate in joint work and share accidents history to avoid committing the same mistakes.

Health Measures

Borg El Arab Petroleum Company follows a program to maintain health risks. The program is based on a scientific approach to give its workers a feeling of safety and tranquility, while they perform their jobs, and to prevent panic and anxiety faced by the workers due to what they deal with everyday including dangerous tools, materials and devices that may threaten their lives if they are not safe.

Hence, the company provides personal protection requirements to workers, according to the nature of their work and based on the operational standards and global standards, and trains the workers to use them. Borg El Arab Petroleum Company works on avoiding injuries and occupational diseases as well as pollution in general.

Borg El Arab Petroleum Company keeps a ready ambulance with a doctor for in the work site across the 24 hours to provide medical assistance and to be ready to deliver injured ones to the nearest hospital in case it was needed.

It also ensures having a license issued before starting any work to ensure safety and it envisions that safety is a lifestyle not just measured followed, and trains its employees on safety and occupational health measures, as well as on fire handling and first aid. The company performs emergency simulation experience continuously to give its employees the experience they need to evacuate the workplace and to deal with any accidents if needed.

Additionally, it gives rewards to employees based on how the perform according to safety and occupational health standards to ensure the commitment and contribution of the employees.

Environmental Approach

Borg El Arab Petroleum Company shows respect to nature and works on protecting it. Therefore, the company reduces its usage of fuel and crude materials in order to safe natural resources and decrease the fuel effect on the atmosphere. It considers its sites as a part of natural heritage and works on boosting them as the company believes these sites are sorts of biological and wild life varieties.

Accordingly, Borg El Arab Petroleum Company uses environment friendly natural gas run generators instead of diesel run generators to avoid diesel effects on nature. The company also performs environmental and radiation assessment continuously.

The firm also conducts studies and evaluations on its wells to know the environmental impact of its wells. The company ensures receiving environmental approvals before drilling in order to save the surrounding environment and to prevent pollution.

Borg El Arab Petroleum conducts periodic follow up, in addition to the periodic audit performed by regulatory bodies, in order to ensure the company's commitment to the QHSE standards.

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QHSE: THE INDUSTRY'S

By Nouran Ashraf

The oil and gas industry is involved in a high-risk business where any error can result in potential damages to the health and safety of its staff, as well as negatively affect the environment. Accordingly, Quality, Health, Safety and Environment (QHSE) Management should be prioritized by any successful oil and gas organization that wants to build a healthy and safe working place for its employees and further protect the environment in which it operates.

QHSE Management is an integrated management system within oil and gas corporations. The integrated management scheme promotes responsible corporate practices and strengthens the idea that accidents can be avoided with the implementation of proper policies, functional management and effective training.

In 2013, the multinational Ernst & Young released a global report entitled "Business Pulse: Exploring the dual perspectives of the top 10 risks and opportunities in 2013 and beyond", in which it affirmed that health, safety, and environmental concerns were among the top of the oil and gas industry's risk agenda.

National Gas' QHSE Manager, François M. Jacob, said to Egypt Oil&Gas that QHSE management remains one of the top priorities in the local, regional and global oil and gas industry, as it helps in reducing the human injuries, unnecessary lawsuits, and environmental accidents. "By prioritizing health and safety, oil and gas companies are effectively communicating that competent employees are valuable resources in the industry," he added.

Jacob added that improved health and safety standards allow companies to finish their projects with the required quality standards in a timely manner and enables them to improve their business profile. "Following QHSE rules would benefit the industry in enhancing safety levels, bringing uniformity in safety standards across oil and gas companies, minimizing production loss/accidents and optimizing the use of precious oil and gas resources," he further explained.

Healthy Employees Build Healthy Businesses

The oil and gas manpower is subjected to occupational risks that might cause serious health problems for employees over the short or long term. The American Occupational Safety and Health Administration (OSHA) identified eight health hazards that the oil and gas employees can endure, including exposure to hydrogen sulfide during drilling operations, silica exposure during hydraulic fracturing, occupational exposure to noise from heavy equipment, exposure to diesel particulate matter, dangerous chemical exposure, naturally occurring radioactive material (NORM), temperature extremes and fatigue.

The employees exposed to such hazards over a long or short period can suffer from a wide range of health complications including respiratory, brain and nervous system diseases, which accordingly contributes in the fatality rate of the oil and gas employees worldwide.

The role of the QHSE department in oil and gas corporations is to identify the situations in which the staff's health can be threatened and work on how to prevent their occurrence with the proper tools and management. It includes providing the employees with the right equipment to protect them from harmful exposures, increasing their health awareness, and providing them with the needed medical care in case of emergencies.

QHSE Expert, Mohamed Shirazy, told Egypt Oil&Gas, "QHSE department's main focus is to ensure that the oil and gas workers and people affected by the operation can return home safely to their families and that everyone is protected from any harmful health hazard." He further stated that "the oil and gas companies should focus on work-related health risks, such as chemical exposures, and allocate the right tools and resources to prevent such risks from occurring."

HSE Consultant, Mohamed Darwesh, stated to Egypt Oil&Gas that "the main goals of the QHSE management are clearly headed toward the human, who is the main key to the whole process, where his occupational health and hygiene standards are monitored and measured to ensure that he doesn't catch any diseases due to his exposure to occupational hazards."

Creating a Safe Working Environment

Oil and gas personnel work within dangerous working conditions most of the time; such work environment can cause severe injuries to the hard-working labor, which might result in permanent health damages or even death.

Although many corporations are heading towards creating safer working environments for employees and are currently developing ways to minimize the danger they are subjected to, the fatality rate and the work related incidents among oil and gas workers is relatively high in comparison to other industries.

Oil and gas work-related incidents include vehicle collision, machine hazards, fall dangers, fire, and explosion. These incidents mostly occur due to multiple reasons, such as carelessness and

> "We need to manage health and safety with the same degree of expertise and the same standards as other core business activities."
>
> **QHSE Oil and Gas Expert, Mohamed Nassar**

STAMINA

recklessness of the workers, misuse of equipment, failure in using the assigned safety equipment, and the lack of appropriate safety training.

The QHSE management focuses on determining why such accidents happen and how to control the hazardous conditions that might allow these accidents to occur in the first place, aiming to achieve "zero incidents" level of performance.

Building safe working environments for employees to work in can be achieved through studying risk management, learning from past incidents, prioritizing safety training, establishing strict safety and health policies and regulations, increasing the number of QHSE employees, and upgrading to newer technologies that promote safer working conditions.

QHSE Oil and Gas Expert, Mohamed Nassar, told Egypt Oil&Gas, "We need to manage health and safety with the same degree of expertise and the same standards as other core business activities in order to control risks and prevent causing harm to people."

According to Nassar, the main goals of health and safety in the QHSE Management are minimizing the financial losses, which arise from avoidable unplanned events), and recognizing that work-related accidents result from failures in management control and are not necessarily the fault of individual employees. It further tackles understanding that the development of a culture supportive of health and safety is necessary to achieve adequate control over risks, as well as ensuring a systematic approach to the identification of risks and the allocation of resources to control them.

Tackling Environmental Threats

Over the past years, environmental concerns arose from the oil and gas operating business due to the negative impacts it forces on the surrounding environment. Understanding those concerns and seeking solutions to reduce and avoid them is a key role of the QHSE department in any petroleum corporation due to the growing significance of the preservation and protection of the environment in building healthy and sustainable business activities.

The negative impacts of the oil and gas industry on the environment is usually generated from the emissions to the air and the discharges to the sea that happens during the operation. Such impacts cover toxicity, exhaust, acid rain, climate change, volatile organic compounds, and waste oil, which can cause a series of health problems as well as death to human, animal and marine life.

The legal framework enforced by world governments can mitigate environmental risks brought by heavy industries, with the energy sector taking the lion's share. National Gas' QHSE Manager, François M. Jacob noted that the QHSE's department role is to manage oil and gas activities in a way that eliminates or reduces any potential negative environmental impact.

"Protecting the environment can be achieved through working according to the applicable environmental laws, conventions, protocols, and regulations, promoting and maintaining a positive environmental culture," he explained.

Delivering Quality

Quality management comprises a combination of quality assurance and control system. It works on ensuring that all the company's processes and operation services are conducted with the highest level of commitment to the quality standards in order to satisfy the needs of the customers and meet the strategic goals of the oil and gas corporation.

Quality Management focuses on establishing customer-oriented processes, building a continual improvement system, creating effective training programs, promoting employee's engagement and involvement, and adopting the scientific and technological approaches.

"Quality has to be something that is considered from the very beginning and built into everything a business or organization does. Planning carefully, monitoring work, and constant reevaluation and adjustment are all extremely important," Jacob said.

As he explained, quality is not catching mistakes before they reach the customer. "You ensure it by setting up a system in which you don't make the mistakes, to begin with. Everyone in the organization must understand and adopt this point of view if the organization is truly going to have quality performance," he added.

> "Quality has to be something that is considered from the very beginning and built into everything a business or organization does."
>
> **National Gas' QHSE Manager, François M. Jacob**

Strong and Sustainable

Due to the harsh nature of the oil and gas operations, the health and safety of the employees working in the industry might be jeopardized and the surrounding environment can be harmed. Building an effective QHSE Management system within the oil and gas corporation can help in establishing a strong and sustainable business that does not negatively affect the people working on it or the environment. Furthermore, it avoids any legal or financial consequences that could affect production performance.

TECHNOLOGY,
THE ACHILLES HEEL OF FUEL PRODUCTIVITY

By Amira S. Badawey

Information systems and technologies play an important role in the oil and gas industry. Firms perpetuate information technology (IT) into their global operations in order to promote tighter controls, unleash productivity, and boost efficiency. With the ever temperamental barrel prices, international oil and gas companies (IOCs) are motivated to roll out hi-tech solutions at upstream sites, as well as throughout their entire value chain. Despite recent attempts to revive global oil prices with initiatives such as the Organization of Petroleum Exporting Countries (OPEC's) efforts to cut their collective production, IOCs remain adamant on transforming operations and creating additional profits from existing capacity through digital technologies.

However, recent cyber-attacks on the UK's National Health Services, which held patient data hostage for ransom payments, and Russia's alleged role in hacking the US elections have sparked global concerns on the vulnerability of IT networks. The involvement of hacktivists and foreign governments in similar incidences highlights the scope of IT security threats, as it spans beyond organizational and industrial borders into the geopolitical realms.

Accordingly, state entities are held responsible for securing infrastructures, national resources, and domestic economies, both physically and in cyberspace. Fossil fuels remain a prevalent source of energy used to power the prosperity of nations, especially so in Egypt and the Middle East. The dichotomy between productivity enhancements via IT and the cost of securing the industry's IT networks, or more notably the cost of neglecting to secure digital exposure, raises the question of whether IT in oil and gas is a flywheel or an Achilles heel.

The Role of IT in Oil and Gas

The oil and gas industry was among the first businesses to embrace technology. During the 1980s and 1990s, way before terms such as Big Data and the Internet of Things (IoT) become common in everyday vocabulary, IOCs relied on 3-D seismic, linear program modeling of refineries, and advanced process control for operations. The use of such technologies unleashed new hydrocarbon resources and delivered operational efficiencies across the value chain.

In August 2016, McKinsey & Company (McKinsey) stated that "the effective use of digital technologies in the oil and gas sector could reduce capital expenditures by up to 20%; it could cut operating costs in upstream by 3-5% and by about half that in downstream." Moreover, the use of advanced analytics for predictive maintenance decreased maintenance costs up to 13%. In addition, the use of this technology led to preemptive equipment maintenance, where mission critical machinery was repaired before it broke down and, therefore, companies were able to avoid production halts.

This comes as IT uniquely leverages operations within the oil and gas industry as they expand beyond multiple regions. The use of heavy capital investments and extended global supply chains position the industry to take advantage of visibility and clarity delivered by digital technologies and advanced analytics. According to McKinsey, this provides IOCs "granular views into operations, increase agility, and support better strategic decision making. Digital enablers, from process

digitization to robotics and automation, can also help realize this potential by supporting processes in dynamic ways."

Furthermore, the fifth Upstream Oil and Gas Digital Trends Survey, which is commissioned by Accenture and Microsoft, showed that IOCs are sustaining their investments in digital technologies. The survey further stipulates that 80% of companies plan to continue investing the same or more in digital technologies over the next 3-5 years, with the largest resources targeting robotics, wearables and artificial intelligence. The survey concluded that "oil and gas companies are focusing their digital investments on areas where they see tangible business value. This includes lowering the cost of operations through increased worker productivity with mobility, lower infrastructure costs through the use of cloud and better asset management through analytics."

As such, IT plays a vital role in better controlling operations at upstream sites. Companies can realize more control and better efficiencies at offshore site that represent hazardous safety risks for staff and crew. Deploying technologies and linking multiple location to a centralized onshore site to monitor operations can prevent the need for physical on-site inspections.

PWC's Strategy& shows that adopting latest technologies was a clear trend in the oil and gas industry in 2016. The global team of strategists stated that the oil major, BP "is already adopting drone technology to inspect pipelines at its remote Prudhoe Bay field in Alaska."

Moreover, IOCs rely on IT structures and advanced new technology to innovate, minimize costs, and help contribute to achieving a lower-emissions environment, with companies such as ConocoPhillips, Eni, and Neste back-fitting existing equipment for refining and producing renewable energy. These companies invest in refining processes to replace diesel with fuel from soybean, palm, and canola oils as well as fats and animal tallow in airplanes and commercial transportation.

Resilience in Oil and Gas IT Networks

As technology and digital solution further extend to various aspects of industries, economies, and our lives in general, the more appareling these networks become to hackers. Exploiting technology's vulnerability has surpassed the scope of mere information security, which is concerned with preventing unauthorized access, use, disclosure, disruption, modification, inspection, recording or destruction of information.

Hackers attack IT networks in deliberate acts of sabotage, with the aim of disrupting services and causing massive losses. In May 2016, NPR reported that "more than 200,000 computers in some 150 countries have been hit by a cyber-attack using ransomware called WannaCry or WannaCrypt, which locked the data and demanded payment in bitcoin." This story marked the heightened use of ransom ware, which is a maleficent computer program that hijacks IT networks and vital data with the aim of holding services and information hostage for ransom payments.

Although such attacks have so far targeted civilian data through healthcare providers or commercial websites, the oil and gas industry was not spared. In 2012, a virus called Shamoon obliterated files from 30,000 corporate computers at Saudi Aramco, one of the world's largest oil exporter. A subsequent attack targeted Qatari natural gas company RasGas. Compounding the issue that the oil and gas sector is an attractive target for hackers is the fact that industrial control systems across the sector are woefully unprepared to protect themselves against attackers.

The 2017 WannaCry attacks highlighted a severe weakness in some oil IT networks, as the maleware exploited security gaps in an outdated version of Windows operating system. The Houston Chronicle informed that that very same operating system was still used at many US refineries, offshore platforms and other energy stations. This exposed these facilities to similar attacks. The publication added, "The stunning attack revealed the fragility of the technology that keeps the economy running, and security professionals warned US oil companies could be among the potential targets of sweeping online assaults that attempt to disrupt global order."

The attack further revealed additional vulnerabilities IT networks in the oil and gas industry. Cyber security experts explained that oil and gas would be an easy target for hackers because oil companies often delay patching their computer controls at refineries and offshore upstream sites, as these lagged updates do not disrupt production.

Moreover, the oil industry does nott have specific cybersecurity regulations, and oil companies are not required to disclose their cyber-attacks, whether failed or successful ones, to authorities. Therefore, the public does not have clear visibility of the resilience of IT networks and digital systems at oil and gas facilities. Yet, the WannaCry incidents have motivated US oil company boards to demand that IT managers prove refineries and drilling rigs are protected against cyber-attacks.

Israeli cybersecurity firm Indegy's CEO, Barak Perelman, stated, "Increased awareness of industrial cyber threats seem to have spurred new corporate-level maneuvers to secure computer controls that run energy facilities." Pereleman clarified that specific tactics are required to combat cyber-attacks in the oil industry beyond those used with Windows and Apple systems, as oil and gas facility rely on a diverse array of technologies from companies such as Siemens, Honeywell and Emerson.

However, the severity of cyber-attacks in the oil and gas industry go beyond production disruption. If hackers accessed drilling sites' safety control, they could cause catastrophic events that impact countries' national security.

IOCs and Governments - Hand in Hand

At the time of the WannaCry attack, Microsoft's President, Brad Smith, wrote in a follow-up blog that "the governments of the world should treat this attack as a wake-up call. We need governments to consider the damage to civilians that comes from hoarding these vulnerabilities and the use of these exploits." He added, "We need the tech sector, customers, and governments to work together to protect against cybersecurity attacks."

Moreover, former US Defense Secretary, Chuck Hagel, commented on the Aramco and RasGas attacks, calling them a "a serious wake-up call to everyone." He added that "the United States will continue to help build the capacity of partners and allies to defend their critical infrastructure from cyber-attack, especially major energy, infrastructure, and telecommunications facilities." Yet, the irony of the WannaCry malicious hack is that the malware was built on a cyber weapon stolen from the US National Security Agency.

This highlights the importance of IOCs and governments collaborating to secure oil and gas sites and reserves on both the physical and logical levels. This is not a new sentiment. Global Cyber Alliance's Head, Philip Reitinger, has been calling for proactive prevention measures through a commitment to proper government funding, similar to other national security threats, the development of new legislations to govern IT controls across industries, regulation of attacks reports, and promoting incentive programs to enforce good behavior by companies.

However, the global oil and gas community, lead by oil majors, will have to mobilize their efforts to pioneer IT security prevention and correction within the industry, lobbying for cross-border collaboration between governments. Accordingly, the US Department of Energy (DOE) held a summit in 2015 to discuss the vulnerability of industrial control systems across the energy sector.

Additionally, the DOE tasked the Industrial Control Systems Cyber Emergency Response Team with the responsibility of coordinating control systems-related security incidents and information sharing with Federal, State, and local agencies and organizations, the intelligence community, and private sector constituents.

> "Increased awareness of industrial cyber threats seem to have spurred new corporate-level maneuvers to secure computer controls that run energy facilities."
>
> **QHSE Oil and Gas Expert, Mohamed Nassar**

Although hacking in high profile businesses like financial, healthcare and retail sectors make news headlines regularly, the less reported breaches in the oil and gas industry can have dire consequences, more dangerous than the theft of personal data.

In the era of industrial IoT and increasingly complex cyber-threats, attacks on public infrastructures, particularly in the energy sector, are becoming frequent. The risks go beyond operability, financial losses and credibility. Cyber-attacks on industrial systems can cross the line into threatening human lives.

Moreover, those working with industrial control systems in the oil and gas industry are aware of the pressure to increase productivity and reduce costs through network integration. The demand for remote support has made many pipeline control systems accessible via Internet-based technologies. These new technologies are enabling companies to implement agile, cost-effective business practices.

Nevertheless, these efficiencies come with a price: pipeline control systems are now exposed to cyber-security threats they were never designed for. This increased connectivity of ICS presents a huge vulnerability, and there is an increasing body of information available to adversaries about what to look for in terms of vulnerabilities in the oil and gas sector. Still, securing vital systems from multiple attack vectors is a serious challenge that requires joint efforts from international organizations, the private sector, the civil society and, especially, governments. It also presents a set of unique difficulties.

Unconventional Gas and Environmental Sustainability

By Mahinaz El Baz

The rapid development of unconventional gas resources in the past few years has dramatically affected the global energy market, increasing the possibility of having a source of low carbon energy to reduce dependence on coal and conventional oil and gas. The mature oil and gas fields and the indispensable need for sustaining energy have rendered the unconventional fields' development a tempting initiative. However, unconventional resources activities have been linked to a myriad of environmental and health concerns, generating public controversy that threatens to stop production activities in some areas.

The problems brought up by unconventional production include potential direct impacts to water quality and supplies, as well as air pollution. Moreover, some have raised concerns about potential long-term and indirect impacts from reliance on fossil fuels, resulting in higher greenhouse gas emissions. Nevertheless, many of the potential direct environmental impacts may be reduced with appropriate safeguards, existing technology, and best practices.

Water Quality

Although many technologies and strategies to minimize the risks associated with unconventional gas development are already being used by some international oil companies (IOCs), unconventional gas operations have continuously received attention for the potential negative impacts that its development may have on the environment and communities in which it occurs.

Water quality issues, for instance, have received much attention as a potential risk related to well stimulation by hydraulic fracturing. Claims of polluted well water have emerged in some areas in the USA where unconventional gas development has occurred, although regulators have not reported a direct connection between hydraulic fracturing of shale formations and groundwater contamination , according to a research written by Michael Ratner and Mary Tiemann entitled An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions.

Even though there is no evidence of a relationship between hydraulic fracturing of shale formations and groundwater contamination, managing wastewater associated with increased unconventional gas production activity has, in some cases, placed a stress on water resources and on wastewater treatment plants that were not designed to remove contaminants from hydraulic fracturing flow back and produced water. These impacts can be mitigated by investing in upgrading and developing control and treatment technologies that enable companies to reuse fluids for subsequent fracturing work.

Furthermore, temporary storage and transport of such fluids prior to treatment or disposal is one of the problematic aspects of handling flow back water. Equipment used to move fluids must be monitored and tested regularly to prevent spills, and precautions must be taken while transporting produced water to injection or treatment sites, whether via pipelines or trucks.

In other cases, fluids may be stored in lined or even unlined open evaporation holes, and even if the produced water does not seep directly into the soil, heavy rain can cause a pit to overflow and create contaminated runoff. Additionally, storing produced water in enclosed steel tanks would reduce the risk of contamination while improving water retention for subsequent reuse.

Air Emissions

Air emissions associated with unconventional gas production have also raised environmental concerns and have drawn regulatory scrutiny. Air pollutants can be released during various stages of production. Emission sources include road and pipeline construction, well drilling and completion, flow back activities, and natural gas processing, storage, and transmission equipment. Key pollutants include methane, which is the main component of natural gas and a potent greenhouse gas, volatile organic compounds (VOCs), nitrogen oxides, sulfur dioxide, particulate matter, and various hazardous air pollutants.

According to the United States Environmental Protection Agency (EPA), the oil and gas industry is a significant source of methane and VOC emissions, which react with nitrogen oxides to form ozone. EPA has identified hydraulically fractured gas wells during flow back as an

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>
> Pico Energy's QHSE Manager, Ibrahim Waly

additional source of these emissions in the natural gas industry.

Emissions of pollutants can also occur where natural gas is produced in association with oil and natural gas gathering pipelines and other infrastructure are lacking. In such cases, the natural gas must generally be flared or vented. Flaring reduces VOC emissions compared to venting, but like venting, it contributes to greenhouse gas emissions without producing an economic value or displacing other fuel consumption.

In the USA, EPA stated that the Environmental Protection Agency took another set of important steps under the Climate Action Plan in 2016. The agency adopted a strategy to reduce methane emissions and cut the potent greenhouse gas from the large and complex oil and natural gas industry. In 2025 it is expected to reduce 510,000 tons of methane, get a net climate benefits estimated at $170 million, and yield climate benefits of $690 million.

Seismic Risks

The possibility that drilling and hydraulically fracturing shale gas wells might cause low-magnitude earthquakes has received attention recently as a potential subsurface risk. According to a paper by Mark Zoback entitled Addressing the Environmental Risks from Shale Gas Development, “in 2008 and 2009, the town of Cleburne, Texas, experienced several clusters of weak earthquakes all registering 3.3 or less on the Richter scale. Since the town had never registered an earthquake in its 142-year history, some residents wondered if the recent increase in local drilling activity associated with the Barnett Shale might be responsible”.

Although no official connection was found between the hydraulic fracturing and these earthquakes, a study by seismologists with the University of Texas and Southern Methodist University indicated that the injection of waste water from gas operations into numerous saltwater disposal wells that were being operated in the vicinity could have caused the seismic activity.

Surface Water and Soil Contamination

Significant actions must be taken to ensure that extracted gas and chemicals do not contaminate surface water and soil during their transport, storage, and disposal, as the quantities of materials that must be stored at drilling sites and the volumes of liquid and solid waste that are produced should be handled over. Hence, the companies should cooperate with government agencies, environmental organizations, and local communities to develop innovative technologies and practices that can reduce the environmental risks and impacts associated with developing unconventional gas resources.

Since instances of water contamination, air pollution, and earthquakes have been blamed on unconventional oil and gas extraction activities, understanding the techniques used to extract unconventional gas, especially shale gas formations, and the safeguards that exist to prevent environmental damage is critical to assessing the sources and magnitudes of risk involved in its development. However, not all companies in all countries adopt the QHSE schemes, which makes it an unpopular feature. Pico Energy’s QHSE Manager, Ibrahim Waly, said, “QHSE is not activated in most of the National Oil Companies (NOCs) in Egypt, while International Oil Companies (IOCs) are applying around 70% of the QHSE systems.”

Egypt’s Unconventional Gas

In Egypt, unconventional gas presents a great opportunity for the economy. Yet, along with this opportunity, the growth of unconventional techniques associates with increased environmental, social, and health risks, which might bring up public concerns and impose a roadblock to its development. Although strong resistance to unconventional schemes is not likely to come from the general population in Egypt, but rather from decision makers, NGOs, environmental organizations, and local communities, many of the IOCs operating in the country have far-reaching reputational concerns that will need to be managed.

Still, even the industry’s most harsh critics admit that many of the environmental concerns can be addressed if best practices are followed. Therefore, developing and adopting innovative best practices became a must in addressing the environmental risks associated with unconventional gas development. In addition, implementing strong regulations is necessary to ensure broader adoption of these practices and to minimize risks to the environment.

HEALTH RISKS CONTROL IN OIL AND GAS INDUSTRY

By Sarah Samir

The oil and gas industry is a field full of health risks and hazards that may affect employees working in the site or people living in nearby areas. With the ending of the easy oil phase and the emergence of the difficult oil era, oil and gas firms, along with governments and high authorities, tend to work on mitigating these risks. In addition, oil and gas companies sought obtaining licenses and adopting global standards in order to ensure the safety of the employees working in their fields whether offshore or onshore, and whether these fields are being explored through conventional or unconventional methods.

Health Risks

People working in the oil and gas fields are exposed to several hazards that can negatively affect their health. Maridive's Offshore Projects Company, QHSE Manager and Industry Expert, Muhammad Fouda, explained to Egypt Oil&Gas that the hazards which affect the oil and gas industry can be classified into fire, falling objects, scaffold, lifting operation, unguarded machinery, working at height, unsafe access or egress, and being stuck by foreign body. "The risks faced in the oil and gas industry also include excavation, crane, electric, structural member, vehicle and forklift, diving, oil spill, and working platform

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>
> Maridive's Offshore Projects Company, QHSE Manager and Industry Expert, Muhammad Fouda

hazards."

According to the article Oil and Gas Health Effects, published by Earth Works, "Landowners and residents of oil and gas field communities are reporting health impacts that they believe are linked to environmental toxics associated with the oil and gas development activities in their area." As informed on the article, "these reports include incidents of: asthma, respiratory and cardiovascular illnesses, autoimmune diseases, liver failure, cancer and other ailments such as headaches, nausea, and sleeplessness."

Moreover, the petroleum industry can affect the lives of its employees as "various forms of radiation and thermal extremes are also relatively common on offshore platforms. Exposure to extreme heat and direct sunlight in tropical areas and to extreme cold in high latitudes can become significant sources of health risk dependent on the geographical region of the world," as mentioned in Karen Niven and Ron McLeod's book, entitled Offshore Industry: Management of Health Hazards in the Upstream Petroleum Industry.

The oil and gas exploration process may also lead to fire and explosions. In 2010, for instance, "a well control event allowed hydrocarbons to escape from the Macondo well onto Transocean's Deepwater Horizon, resulting in explosions and fire on the rig," according to BP's Deepwater Horizon Accident Investigation Report. The report further mentioned that "11 people lost their lives, and 17 others were injured" in the incident.

However, hydrocarbon leakage is not always caused by risky incidents. Sometimes, it is resulted from normal operations. The Petroleum Safety Authority Norway's mentioned in their article Hydrocarbon Leaks and Fires that "40% of hydrocarbon leaks occur in connection with normal operation, whilst the remainders arise during other manual work on/at the facility." Thus, as normal operations can already trigger severe risks to oil and gas staff, petroleum operators should ensure the safety of the sites they are working in.

Health Risk Management Techniques

The risks of hydrocarbon industries are not easy to control. Fouda stated that it is not possible to prevent 100% of the risks in the oil and gas; yet, reducing risks is not impossible. He explained, "We work to minimize the risk, reference to ALARP System, as low as reasonably practicable. So, the best way to minimize the risk is, for every task, to be SMART - specific, measurable, achievable, realistic and time bound - in order to be able to manage it. In addition, we must focus on training and employees competencies to raise their safety culture to meet the task requirements."

In order to control the health risks which the oil and gas employees are exposed to, each petroleum company should set plans to restrain exposure. Vietnam Manpower's Business Development Officer, Chi Nguyen, stated in his article, entitled 8 Occupational Health Hazards in Oil and Gas Industry That You Must Know, the key measures to protect workers against chemical exposures. As he pointed out, an Exposure control plan (ECP) should include "purpose statement, responsibilities of employers, supervisors and workers, identification and assessment of risks, risk controls, manpower education and training, written safe working procedures, hygiene facilities and procedures of decontamination, documentation, and health monitoring."

In addition, petroleum firms tend to use facilities and techniques to control the emission of H2s. An article written by Krishaswamy Rajagopal, Rogério Lacerda, Ivan Slobodcicov and Eugenio Campagnolo, entitled Modeling and Simulation of Hydrogen Sulfide Removal from Petroleum Production Lines by Chemical Scavengers, explained that companies "inject expensive chemical scavengers in production pipelines so that the corrosion and operational risks can be minimized."

Additionally, the article suggested that that "scavenging of hydrogen sulfide is the preferred method for production of crude oil containing low hydrogen sulfide levels from subsea wells, especially where the well is tied back via a flow line to a host facility at which there is no provision for H2S scavenging and/or where a H2S removal facility is too expensive and/or impractical to install." Therefore, having a more advanced "atomization" helps the oil and gas operator to mitigate the production of H2S.

As such, in order to mitigate the health risks faced by the oil and gas industry, an operator should go through different stages. According to UK's Health and Safety Executive article, entitled Health Risks, risk management goes through four stages.

The first stage is "identifying the health hazards," in which the operators should spot the risks based on their knowledge and through consulting "occupational hygienists, nurses or physicians." The second stage is "assessing the health risks," through identifying and measuring the nature and duration of the risk as well as its effects. The third stage is the phase in which the operators "control the risks" by placing "engineered controls, procedural controls, personal protective equipment." Meanwhile, the final stage is "mitigating the risks" through setting a backup plan "to act quickly, if there is a failure in control, to minimize any ill health effects," as explained in the article.

IOP science's book, Ecological policy in oil-gas complexes, HSE MS implementation in Oil and Gas company, explained that "internal audit of the first level is the internal audit in the Central Administrative Office and oil-gas complex, its arrangement and performance is carried out by auditors of Central Administrative Office." The book added that in oil and gas complexes, the Departments of Environmental Protection and Occupational Health and Safety perform internal audits based on Standard/MS Document OHSAS 18001:2007 and ISO 14001:2004. Hence, petroleum firms are keen to secure the work climate in which they drill.

OHSAS 18001 Model

The OHSAS 18001 is "a management system dedicated to occupational health and safety," which has been developed to work in line with ISO 45001 to "assist in the reduction and prevention of accidents and accident related loss of life, equipment and time," according to IMS International's article, entitled OHSAS 18001: Health and Safety Management Systems.

The article explained that, by obtaining the OHAS 18001 Certificate, a company is able to "enforce procedures for compliance with legislation, provide better identification of hazards and risk management, and promote teamwork and inclusion through setting objectives, targets and documented responsibilities. It also provides a platform for attracting lower insurance policies, maintaining a good reputation and proving due diligence to the marketplace."

The OHSAS 18001 was originally set by "the British Standards Institution to provide uniform health and safety protections for workers worldwide, " as the OHSAS 18001:2007 certificate helps in identifying and controlling the "health and safety risks, reduce the potential for accidents, aid legislative compliance, and improve overall productivity within the context of a management system," according to Mireaux's OHSAS 18001 consulting. Hence, the operator can ensure the safety of its employees and control the health risks faced by employees working in the hydrocarbon fields.

It goes without doubt that risks in the oil and gas business are part of its fundamentals. Nevertheless, energy companies are capable of minimizing the sector's massive spillovers, placing safety of its personnel as a top priority. In this sense, countries should adopt a progressive approach by approving drilling operations that comply with international health and safety standards. Through the cooperation between the operator and the country's government, the process of exploration and producing oil and gas could be handled with the least possible health hazards.

US Withdrawal From The Paris Agreement: The Legal Implications (Or Lack Thereof) On The Energy Industry

By Erica Fauser

On June 1, 2017 US President Donald Trump controversially announced that the USA would no longer be part of the Paris Agreement (or Paris Climate Accords as they are often referred) and effectively signaled the withdrawal of the United States from the Agreement as a signatory.

President Trump's decision to withdraw, however, has left many leaders in the energy industry and their attorneys scratching their heads in confusion. On the one hand, less restrictive greenhouse emission standards would seemingly favor the energy industry, while on the other economists have already predicted that a US withdrawal could potentially hurt job growth and availability in the renewable energy sector.

So what does the US withdrawal mean for energy and renewable industries? For clean energy investments? For conventional fuels? Specifically, what are the legal implications and ramifications of the US withdrawal from the Paris Agreement on the energy industry, if any?

The answer is that the withdrawal arguably will have little to no meaningful legal impact on the energy sector. This is because the USA was not really part of the Paris Agreement to begin with, at least in the sense that the US viewed the Paris Agreement as a legally enforceable treaty.

Had it truly been legally enforceable, the United States under the Obama administration would not have signed on to it in the first place. The only enforcement mechanism that the Paris Agreement truly had was the public shaming

that would follow should a country not live up to its goals, or withdraw as the United States has done. For these reasons, the US withdrawal from the Paris Accord will have virtually no substantial legal impact on the energy industry, particularly in regard to the United States.

USA Not Really Part of Paris Climate Accords

The United States was arguably never truly part of the Paris Agreement in the first place, because, at least politically, it was never viewed as a legally enforceable agreement, such as a treaty. This is because within the United States, the term "treaty" has a much narrower meaning than is understood internationally.

The Obama administration negotiated the Paris Agreement as an executive accord, rather than as a "treaty." This was a political tactic, "legal jiu-jitsu" that enabled then President Barack Obama to evade putting the decision to join the Paris Agreement to a predominantly Republican Senate.

Article II of the US Constitution grants the President the power to make treaties, provided that the "treaty" receives the advice and consent of the senate and two-thirds of the senate concur. Executive agreements, on the other hand, need not bother with the senate or even be put up for a vote because the president can carry out an executive agreement unilaterally.

The Obama Administration consistently characterized the Paris Agreement as "definitely not a treaty" in large part to avoid putting the Paris Agreement before the Senate, which would have certainly killed the Agreement on spot. Further, the characterization of the Paris Agreement as an executive agreement rather than a treaty, in effect, replaces any mandatory, top-down targets set forth in the Agreement with voluntary plans and goals in order to avoid the legal definition (and enforceability) of a treaty.

Paris Climate Accords Lack "Teeth"

Yet, despite the difference in domestic terminology, all international agreements are considered treaties under international law, according to The Vienna Convention on the Law of Treaties. However, even if the Paris Agreement were regarded as a treaty in the US, the nation's withdrawal is still virtually meaningless, because the deal was more of an aspirational document rather than a legally enforceable one. In other words, it had no "teeth."

Under the Vienna Convention, a treaty as is defined "an international agreement concluded between States in written form and governed by international law" (VCLT art. 2.1(a)). Whether an agreement constitutes a treaty does not depend on what the agreement is called (such as whether the US considers it an executive agreement or not) rather, it depends on whether the parties manifestly intended to be bound by international law.

Furthermore, not every provision in a treaty necessarily creates a legal obligation, the breach of which entails non-compliance and penalties. However, regardless of whether the Paris Agreement was a "treaty" or an "executive agreement" under US or international law, there is virtually no legal effect on the President Trump's decision to withdraw, other than that he cannot actually withdraw until 2020.

Even under international law, the right of the United States to withdraw is governed by the agreement's withdrawal clause in Article 28, and, as a matter of US law, the country's participation may be rightfully terminated by executive action, or if Congress were to pass legislation effectively cancelling the treaty's effectiveness

The Accord

The Paris Agreement was entered into on December 12, 2015 and went into effect in November 4, 2016. The nearly 200 signatory countries to the agreement acknowledged the existence (and seriousness) of climate change and world leaders agreed to, among other things, limit average temperature increases, curtail greenhouse gas emissions, implement monitoring procedures to promote transparency, and provide financial and technical assistance to poorer nations in order to implement the goals.

Specifically, the standards set forth in the agreement pledged to collectively hold temperature rises well below 2 degrees Celsius from pre-industrial levels in an effort to avoid global warming, rising seas, and superstorms that climate models have predicted. In addition, each signatory nation set forth goals to reduce greenhouse gas emissions, which the Obama administration intended to use the Clean Power Plan as a vehicle to implement it.

However, there was no legal enforcement mechanism in place to hold countries to the promises of the deal, and no legal way to hold any of the signatories accountable for not meeting the goals to curtail greenhouse gas emissions, or force signatories to comply with the monitoring procedures.

Let the Public Shaming Begin

The only effective enforcement mechanism that the Paris Agreement truly possesses is enforcement via peer pressure and public shaming, and president Trump's decision to withdraw has already sparked an international campaign against the United States.

While President Trump argued that the accord undermined the US economy, cut domestic jobs, weakened national sovereignty and permanently disadvantaged the United States compared to other nations, international leaders have responded with overwhelming criticism of the decision.

German Chancellor, Angela Merkel, French President, Emmanuel Macron, and Italian Prime Minister, Paolo Gentiloni, issued a rare joint statement saying the agreement cannot be renegotiated, according to Reuters. In a video posted to his Twitter, French President Emmanuel Macron offered his own version of President Trump's campaign slogan with a call to "make our planet great again" following Trump's decision to pull the US from the agreement. Former President Obama said Thursday that Trump's rejection of the accord places the US among "a small handful of nations that reject the future… The nations that remain in the Paris agreement will be the nations that reap the benefits in jobs and industries created," he said in a statement.

Public shaming, however, is a surprisingly effective means of enforcement of environmental regulations within the United States and internationally. The United States already employs a form of environmental peer pressure and public shaming through emissions trading with legislation such as Clean Air Act and the Acid Rain Program. These emissions trading systems use a market-based approach to control pollution by providing economic incentives to those companies that achieve reductions in the emissions of pollutants. Because no modern company wants the reputation as a "top polluter," this market based-public shaming approach has been very effective within the United States.

Withdrawal and Industry

In addition, state and local governments within the country have already pledged to fulfill the promises of the Paris Agreement in spite of Trump's withdrawal. Looking at the potential impact from an industry perspective, the renewable energy industry is largely driven by state standards and regulation, not the agreement, so existing law will continue to govern.

Further, rather than hinder investments in renewable energy, the US withdrawal has encouraged it. The former Mayor of New York, Michael Bloomberg, for instance, has pledged $15 million to continue to invest in clean and renewable energy stating that "Americans do not need Washington to meet our Paris commitments, and Americans are not going to let Washington stand in the way of fulfilling it." Even the Trump administration is looking at solar panels to be installed on the Mexico wall.

Being in or out of Paris will have also minimal effect on business plans. US companies may still pursue climate-friendly business opportunities, as many are already doing. ExxonMobil's CEO, Darren Woods, was a staunch advocate for keeping the US involved in the Paris Accord, along with his predecessor and current Secretary of State of the US, Rex Tillerson. Both Woods and Tillerson understand the reality of climate change while also acknowledging that energy needs are a function of population growth and living standards.

According to Woods, "Population growth and a desire for higher living standards will increase usage of petroleum-derived fuels, especially for transportation, because there are few widely available alternatives… There's a huge untapped energy market among the 1 billion people who currently have no access to electricity and the 3 billion who do not use modern cooking fuels."

While a US withdrawal from the Paris Accord would be "a great disappointment," the shift toward renewable energy is inexorable, Gerard Mestrallet, chairman of French utility Engie SA, said in an interview on the matter. Most countries will stick with the accord, and in the US, corporations that regard reducing emissions as a duty will adhere to its principles because the move toward renewables "is an irreversible trend that's gaining momentum," he said.

In the US, renewables (similar to many other energy sources over the years) relies heavily on government subsidies/mandates. These were in place well before the Paris Agreement and are still current law. Although the Paris exit signals the marketplace that this administration is not a fervent "believer" of climate change, until the subsidies change domestically in the US, industry keeps moving forward.

Withdrawal from the Paris Agreement will have no legal effect on the energy industry because the energy industry is already on the inevitable path towards emissions reductions and renewable energy. Energy makes the world go round, and the demands of the market will dictate how climate change ultimately impacts the energy sector, rather than an aspirational agreement.

QATAR CRISIS AND ITS IMPACTS ON THE PETROLEUM INDUSTRY

By Mahmoud Rashed, Geologist

On June 5, Egypt, Saudi Arabia, the United Arab Emirates (UAE), Bahrain and other Arab countries cut diplomatic ties with Qatar in a coordinated move after allegations that Doha supports terrorist organizations and interferes in the internal affairs of countries in the region.

The action resulted in the shutdown of all transport and trade links with Qatar. Saudi Arabia, the UAE, and Bahrain banned Qatari airplanes from landing in the countries and crossing their air space, and the UAE further banned vessels coming from and heading to Qatar. The bans on Doha's fleet using regional ports and anchorages are threatening to halt some of its exports and disrupt those of liquefied natural gas (LNG).

Supply Shortage

As the Gulf nation is the world's top seller of LNG and supplies nearly a third of the product worldwide, the bans triggered supply shortages for the tiny rich peninsula, and the stock market index sank 7.3% directly.

Accordingly, the availability of ships for Qatar loading is expected to decline. UAE-based Gulf Energy Maritime's ships are unlikely to navigate in the country, and Dubai's DP World stated it is banning all vessels carrying Qatar's flag from calling at its home terminals in the UAE, although the nation, alongside Egypt, is a regional consumer of the Qatari LNG.

The ban on direct sailing to and from Qatar by Fujairah in the UAE also poses particular concern. Through Fujairah, thousands of ships load bunker fuel, which means that co-loading of partial cargoes of naphtha, gasoil, and gasoline in multiple ports in the Middle East will take a severe hit unless the rift ends anytime soon.

For Egypt, the shipment bans are not a major concern as trade houses with supply commitments with the North African country could turn to the United States, Algeria, and Nigeria for replacement of cargoes and traders.

The UAE, however, consumes 1.8 billion cubic feet per day of Qatari gas via the Dolphin pipeline and has LNG purchase agreements directly with its neighbor. Although flows through the Dolphin pipeline are, so far, unaffected, traders say even a partial shutdown would ripple through global gas markets by forcing the UAE to seek replacement LNG supply just as its domestic demand peaks.

The crisis has increased sharply as Taiwan's Evergreen, the world's sixth bigger container shipping line, in addition to Hong Kong's OOCL, the world's seventh biggest carrier, announced the suspension of shipping services to Qatar as the diplomatic conflict imposed port restrictions. Denmark's Maersk, the world's biggest container shipping line, subsequently stated it was unable to transport goods in or out of Qatar due to the impossibility of taking them through the UAE port of Jebel Ali.

That has forced Qatar, a member of the Organization of Petroleum Exporting Countries (OPEC), to book new refueling stops in Gibraltar, Singapore, and other shipping fuel hubs, according to brokers. Additionally, the country currently faces higher costs to sell its energy supplies to customers in Asia and Europe, and the diplomatic crisis affected all major oil-products trading companies, which are redrawing their loading plans.

While the Gulf state's exports of crude oil, condensate and LNG are continuing, oil brokers and traders say it has had to scramble to find new ports to refuel its vessels after the UAE banned Qatari-linked vessels from its waters.

Oil price

Although Qatar is only the 10th biggest producer in OPEC, its huge shipments of LNG, which set it apart from other Gulf energy producers, are largely linked to the oil price. As such, the tension in the Gulf is causing minor disruptions to the usual order of energy trade in the region.

S&P Global Platts, the oil price agency that assess benchmark prices for physical oil trades, has said crude from Qatar will be largely excluded from its Middle East trading window because of the complications caused by shipping restrictions for the Gulf state. It means that the restrictions on vessels calling into Qatar and associated uncertainty could further affect the inherent value of crude loading from Qatar.

Furthermore, as a member of OPEC, Qatar joined the cartel's production cut agreement and committed to cut its crude output by around 30,000 barrels of oil per day. The organization aims to get rid of the global market oversupply of crude, which has held prices down since 2014. With the current crisis, Qatar's willingness to comply with the supply cuts could wane, even though Kuwait, which is attempting to mediate between Qatar and its neighbors, said that the Gulf country remains committed to the OPEC and non-OPEC deal. The agreement, which Qatar was instrumental in organizing late 2016, was extended for nine months.

> "The bans triggered supply shortages and the stock market index sank 7.3% directly."

Oil market participants have raised doubts that Qatar, the relatively small player in oil, would be able to produce enough oil to breach its quota. However, others fear that the break between Gulf states could prove enough to cause the deal to unravel in time.

Despite all these outcomes, there is uncertainty on the impacts that the diplomatic crisis can impose on the global oil and gas market in the future. The situation is still at the beginning and can either increase or be amended over time.

Strategy of asset acquisitions and capital investment together with farm-ins and concession bid rounds.

Apex is committed to operating in a safe, sustainable and responsible manner together with supporting community outreach programmes such as Hands Along the Nile.

Significant funding in place led by Warburg Pincus.

For further information, please contact info@apexintl.com.

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SAFETY CHALLENGES IN THE ERA OF OIL CRISES

Right from the time the oil and gas industry was born, it has faced ongoing challenges in virtually every aspect: financial, operational, and safety. When oil prices plumbed to their nadir in 2016 – the price of Brent crude fell to $27.67 a barrel, the lowest since 2003 – it presented new challenges in ensuring not just the safety of people and premises, but also environment protection. Today, these are the biggest and most common challenges confronting many oil and gas owners, service companies and other related enterprises such as producers of oilfield chemicals.

These challenges can be categorized under the following four heads:

1. Cost reduction

When businesses in the industry attempt to slash costs, safety bears the brunt of budget cuts. There are fewer safety training programmes, delayed maintenance schedules, and procurement of less reliable devices and tools instead of more reliable but expensive options. All of which adversely impact the overall safety of system components as well as operations in progress.

2. Higher workload per employee

Any crisis sees significant numbers of oilfield employees getting laid off, and consequently, ever-increasing workloads for retained employees. As they struggle to cope by working longer hours and performing additional tasks, it results in stress, poorer concentration, higher musculoskeletal risks, and worse, chronic health issues such as high blood pressure, heart diseases and movement troubles.

3. Direction of time and effort to production operations more than safety

In their efforts to boost bottom lines, oil and gas companies demand higher production levels or, at the very least, the retaining of current levels. This drives management to bypass some safety protocols and standards that they deem tedious and time-consuming. This approach can lead to higher incident rates and operations shutdown, while also suggesting to employees that their safety is not paramount.

4. Greater job insecurity

When layoffs become the first and easiest step in crisis response, it leads to much higher levels of insecurity among not just oil and gas field-related employees, but also those of non-related companies. Once this feeling spreads within the work environment, low morale and high stress become all-permeating.

We all know that times are tough, money talks, and all results are evaluated financially. But there's one thing on which we should never cut corners: Safety. Promoting safety standards and a culture of safety across the organization will yield greater long-term profitability, a less polluted environment, low production turbulence, and, most importantly, ensure that we all go back home safely, day after workday!

By Mahmoud Hafez
Safety Engineer

SAFETY CULTURE AS A COST-SAVING MANEUVER

The safety culture is a major and unique attitude within any society and is usually associated with the good human behaviors and safe attitudes toward avoiding injuries and illnesses. As the name "culture" suggests, its notion comes to all minds from the first moment that one gets in contact with people's habits and traditions. However, certain conditions also play a role in establishing safety culture.

The European culture, for instance, which is believed to be very sophisticated and high standard, was developed by learning from previous situations and mistakes to minimize the chances of suffering and feeling pain. It became a standard for us as Europeans work always on exerting their best efforts to save lives, maintain assets, and enjoy health, in addition to their focus on time and plans to achieve the aimed targets.

It is very important to all personnel at their working environment, whether it is a company, a factory, a school or even a hospital, to know why safety is essential and to understand why an accident could cost 10 times more than avoiding such occurrence or working hard to mitigate the toughness of future losses.

During my experience in the last 12 years, I have witnessed plenty of non-Europeans who qualified for European companies - and I was one of them - only because of their knowledge toward safety culture, in addition to how successfully they work on improving it within the company. Its benefits for the petroleum firm and its workers appear in paying less for incidents, whatever the training budgets was, or even in the cost of PPE and safety devices.

At certain training courses, I used to demonstrate a case study benchmarking the financial and safety performance of two different companies: one of them was a multinational and the other one was not. The safety performance held by the multinational firm was highlighted in the study, and it showed that the company paid nothing for incident claims, legal authorities or even compensations for contractors, workers or assets.

Accordingly, the multinational company, which announced in its annual report that it achieved $2 million, presents a better performance than the other company, which announced a report with $20 million, but still under revision because of claims, insurance premium increase after accidents, compensations and legal authorities' fines payment.

As such, safety culture is vital tool to ensure higher profits, satisfaction of employees, safe and healthy work environment, and expected reputation within the market, which is a free-of-charge advertisement to it.

By Mohamed Anwer Darwesh
HSE Consultant and Tutor at Petrosafe & OGS Training Companies – Ministry of Petroleum

GUPCO REHABILITATION PROJECT AT M-36

By Mariana Somensi

The Gulf of Suez Petroleum Company (GUPCO) launched the Rehabilitation Project as a major ongoing commitment by GUPCO and its shareholders to address the integrity of the company's main complexes, which are between 21 and 47 years old.

The GUPCO is a joint venture equally owned by BP and the Egyptian General Petroleum Company (EGPC), and is responsible for oil and gas production in the Gulf of Suez, the Western Desert and the Nile Delta.

The Rehab Project, which has been carried out since 2005 and has already been applied to Badri, July-10, and Ramadan-6 complexes, aims to reduce risks to personnel, enhance operability of GUPCO's facilities and ensure production delivery. The Morgan-36 Complex (M-36) is the fourth asset to be rehabilitated by the Egyptian firm in the program.

The Basic Engineering of the M-36 Complex within the scheme started in 2009 and progressed into Detailed Engineering until 2014. In 2015, the need to minimize production deferrals during the execution of TAR activities led the company to study alternative options and develop a new strategy to optimize the M-36 Rehab Scope.

Accordingly, an Assessment Process was developed to determine the overall risks within the M-26 Complex and to objectively rank these risks in terms of their impact. The input into the assessment included findings from engineering surveys undertaken on the facilities, integrity inspection reports, HAZOP studies, MAHID and MAR reports, and operations team input.

The Assessment and Engineering Scope was awarded to the Engineering for the Petroleum & Process Industries (Enppi), which is a leading provider of fully integrated engineering, procurement, construction supervision and project management headquartered in Cairo.

As much as 76% of the engineering scope was completed by the end 2016, with the target of issuing all pending MRQs and P&IDs. Following the latest HAZOP, an additional scope has been awarded to Enppi and is currently progressing with a completion date targeted to the second quarter of 2017. The overall engineering progress figures will be revised accordingly.

The Rehab Project's in-house engineering included a methanol injection skid, whose MRQ was prepared in-house and issued for tendering through GUPCO's PSCM; a new flare KOD, whose FEED and detailed design was completed and also issued for tendering through the company's PSCM; and a fire and gas system, which consisted of a permanent system installed using materials available in stock.

Additionally, the in-house engineering included the establishment of a structure assessment and reinforcement to ensure its integrity; a shutdown philosophy, whose optimization is ongoing in order to minimize deferrals and have one integrated TAR shutdown; a flare study review; the application of weight shedding by removing redundant equipment and piping; and cost-saving schemes.

In the lines of the project's new Procurement and Contracting Strategy, it was agreed that GUPCO's PSCM would be used in sourcing remaining equipment and services. Additionally, the procurement of engineering packages were set to be done through Enppi.

The main commodities currently in the procurement cycle include ISS System and News Rooms, expected to be delivered in May; SDV valves, which are under technical evaluation and are expected by October; Methanol Tank, which will be re-tendered, but are likely to be delivered by August; and FKOD Package, whose classifications are ongoing, but delivery is set to take place in July.

The joint venture approved as much as $120 million for the project's current phase, which covers the remaining engineering and procurement scope and the activities to proceed with execution.

From the total budget, $30 million was directed to the Engineering, Procurement & Execution schemes carried out in 2016, $54 million is reserved for execution and Engineering & Procurement support developed in 2017, and as much as $36 million is projected for the execution completion set for 2018. GUPCO has had around $40.4 million of overall cost-savings along M-36 Rehab duration.

Within the project's timeline, the company successfully achieved the M-36 Fabric Maintenance, replacing severely corroded Grating, Handrails, Well Head Covers, Floor Plates, Stairs and Ladders at Production, Drilling, Booster, and Phase IV platforms. Furthermore, it completed the 30" Flare Cold Repair, as well as the pre-fabrication of piping for three high production loss points at Booster, Phase IV and Production platforms.

The full replacement of the M-36 Firefighting Dry System is still on process, as the materials are under purchasing. The Ph-4 Modules Critical Maximo's WOs is also underway. The full replacement of all Firefighting Wet System (229 Spools and 127 Valves) has reached 92% of the overall process.

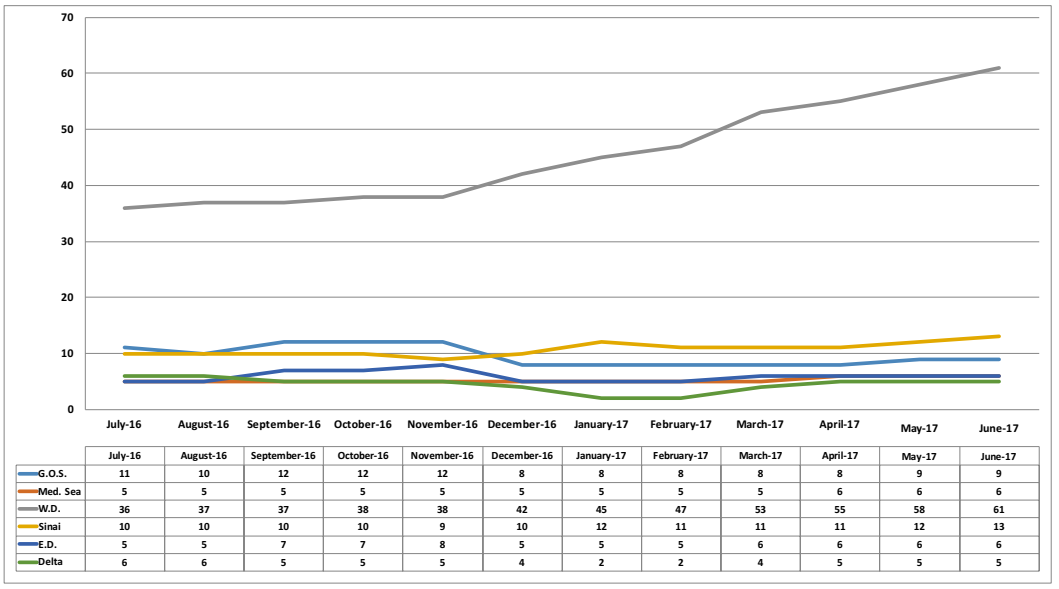
In 2017, GUPCO expects to freeze M-36 SOR, procure balance materials required for TAR phase, finalize engineering deliverables with Enppi and in-house disciplines, update the Integrated Schedule with the preferred S/D philosophy, and expedite EPC cycle for Mandatory Pre-TAR activities.

Additionally, the joint venture expects the new control rooms to be delivered at site by June, with its equipment to be in place by September and to complete termination before TAR. Control and EDS Valves are also projected to arrive prior TAR by at least 45 days, as well as the completion of F&G and instrument devices commissioning. TAR is set to start by November.

GUPCO's Rehabilitation Project is an important initiative to optimize the company's facilities and enhance its operations, avoiding production losses that could negatively affect the Egyptian energy sector. It also ensures a safe environment for technicians and engineers, and boosts personnel performance through a high-quality work environment.

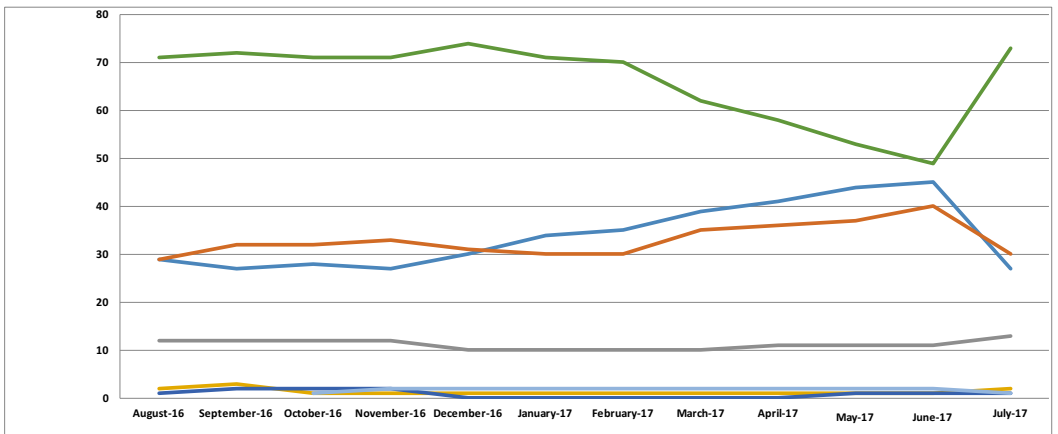
STATISTICS

Changes in Rigs by Area- July 2016 to June 2017



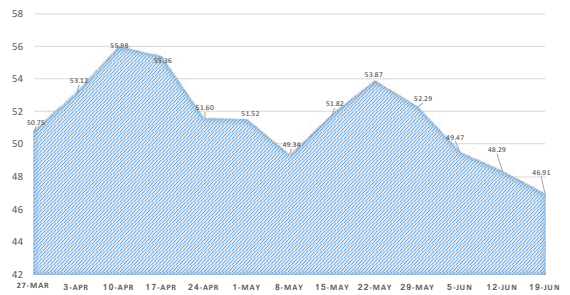
	July-16	August-16	September-16	October-16	November-16	December-16	January-17	February-17	March-17	April-17	May-17	June-17
G.O.S.	11	10	12	12	12	8	8	8	8	8	9	9
Med. Sea	5	5	5	5	5	5	5	5	5	6	6	6
W.D.	36	37	37	38	38	42	45	47	53	55	58	61
Sinai	10	10	10	10	9	10	12	11	11	11	12	13
E.D.	5	5	7	7	8	5	5	5	6	6	6	6
Delta	6	6	5	5	5	4	2	2	4	5	5	5

Changes in Rigs by Type - July 2016 to June 2017

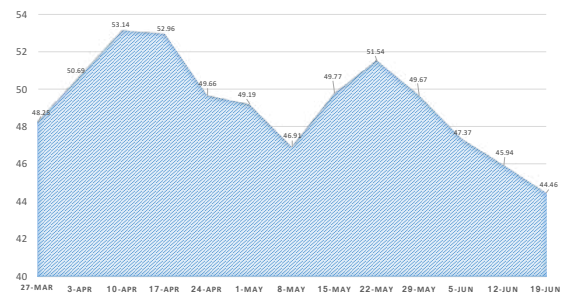


	August-16	September-16	October-16	November-16	December-16	January-17	February-17	March-17	April-17	May-17	June-17	July-17
Land-Drilling	27	29	27	28	27	30	34	35	39	41	44	45
Land Work-Over	30	29	32	32	33	31	30	30	35	36	37	40
Jack-Up	13	12	12	12	12	10	10	10	10	11	11	11
Semi Submersible	2	2	3	1	1	1	1	1	1	1	1	1
Fixed Platform	1	1	2	2	2	0	0	0	0	0	1	1
Standby/Stacking	73	71	72	71	71	74	71	70	62	58	53	49
Drillship	1			1	2	2	2	2	2	2	2	2

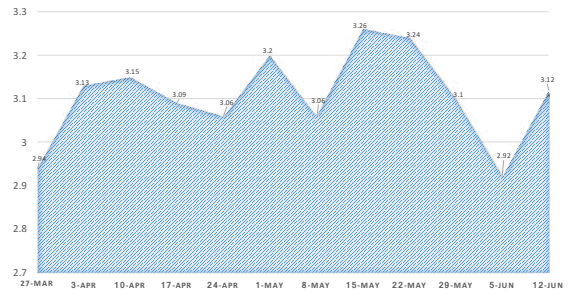
BRENT PRICES



OPEC BASKET PRICES



NATURAL GAS PRICES

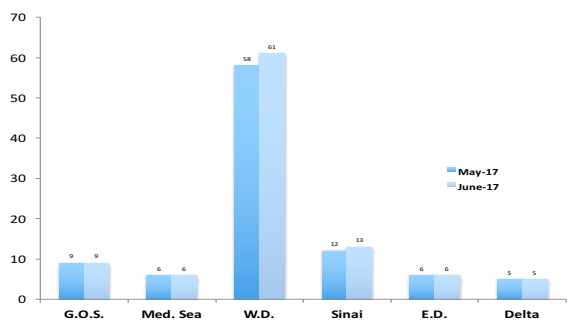


PRODUCTION MAY 2017

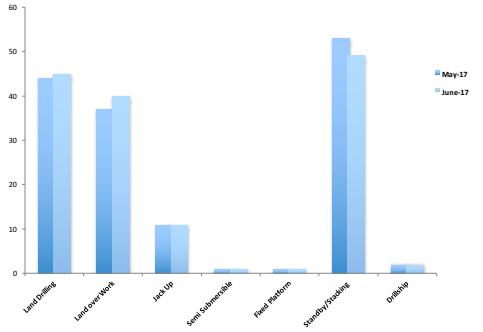
	Crude Oil	Equivalent Gas	Liquified Gas	Condensate
Med. Sea		12910001	190999	6710042
E.D.	1950793	11301	2593	2826167
W.D.	9045214	7725253	669333	1379633
GOS	4029423	718754	280888	7630117
Delta	343095	7542036	131245	4621352
Sinai	1558130	777	33475	1971617
Total	16926655	28908122	1308533	25138928

Unit: Barrel

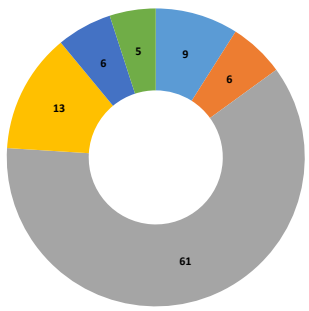
Rigs per Area - May 2016 - June 2017



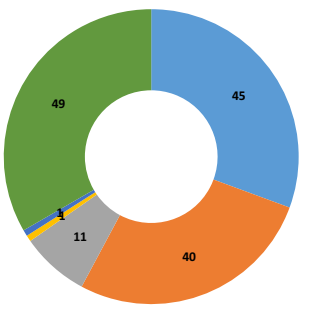
Rigs per Specification - May 2017- June 2017



Rig Count per Area - June 2017



Rigs per Specification - June 2017



RIGS PER SPECIFICATION
MAY 2017- JUNE 2017

LOCATION	May-17	June-17
Land Drilling	44	45
Land over Work	37	40
Jack Up	11	11
Semi Submersible	1	1
Fixed Platform	1	1
Standby/Stacking	53	49
Drillship	2	2
Total	149	149

RIGS PER AREA
MAY 2016 - JUNE 2017

LOCATION	May-17	June-17
G.O.S.	9	9
Med. Sea	6	6
W.D.	58	61
Sinai	12	13
E.D.	6	6
Delta	5	5
G.W.	0	0
Total	96	100

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