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November
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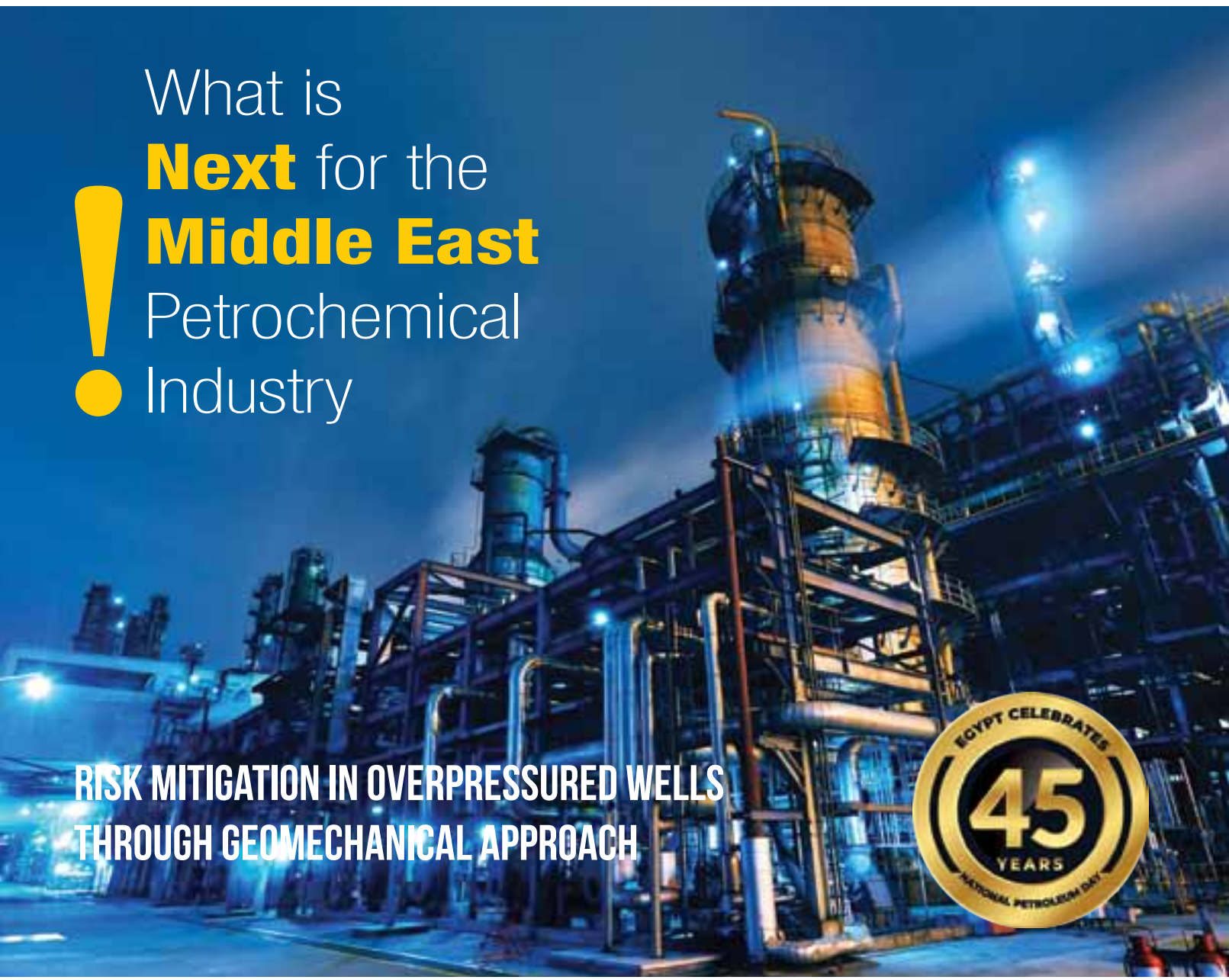
Petroleum Today

What is **Next** for the **Middle East** Petrochemical Industry

RISK MITIGATION IN OVERPRESSURED WELLS THROUGH GEOMECHANICAL APPROACH



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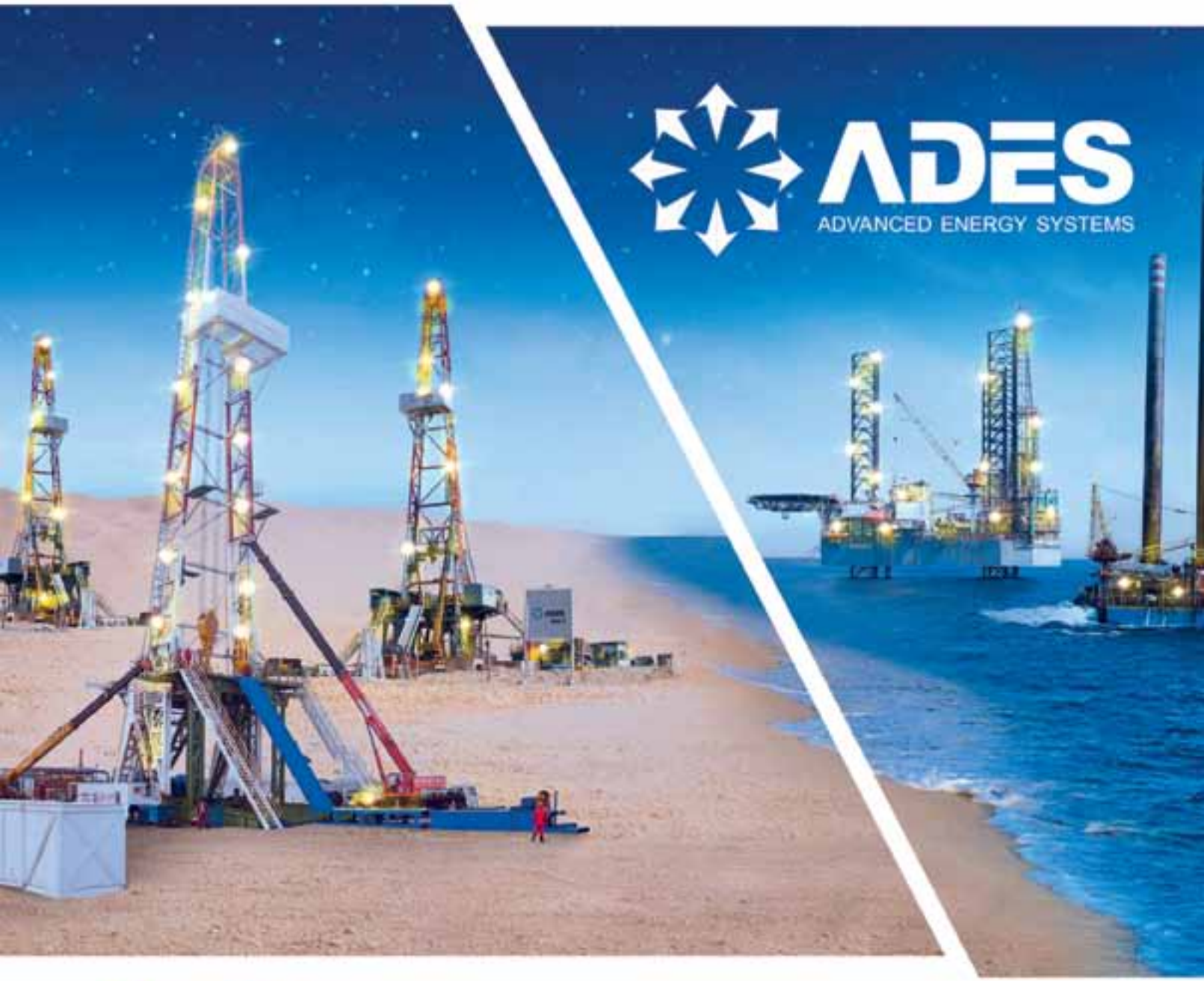

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Contents

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PETROCHEMICALS ARE STEPPING AHEAD

Despite global oil demand plunging an unprecedented 8% this year, Middle Eastern energy producers are still counting on higher petrochemicals production to temper a bleak outlook for peak oil consumption that has spooked crude markets.

Even before the coronavirus pandemic, producers had little choice but to focus on petrochemicals, as the sector will account for 60% of global oil demand in the next decade due to rising consumption of plastics.

In the last decade, road transport fuels represented 60% of oil demand. Probably for the first time, the IEA in this year's annual World Energy Outlook indicated oil demand may plateau from 2030.

Egypt, Iran and Saudi Arabia are the top three countries in the Middle East and North Africa in terms of committed petrochemicals investments.

An interesting topic you will read in this issue that sheds the lights on the MENA petrochemicals investments the current projects throughput. We wish you a happy and informative reading!

In the end, greetings to you, Egypt has pride and dignity

Petroleum Today

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EGYPT NEWS

Eni strikes deals to reopen Egypt's Damietta LNG plant

Italian energy group Eni has struck deals with Spanish gas firm Naturgy and Egyptian partners to resolve disputes over a shuttered gas plant it part owns in northern Egypt. Eni said in a statement that the new agreements would pave the way for the liquefied natural gas (LNG) plant in the port city of Damietta to restart operations by the first quarter of next year.An earlier deal hammered out between Eni, Naturgy and the Egyptian government over the plant fell through in April when a series of conditions were not met.The new deal, which still needs the green light from European Union authorities as well as other conditions to be met, will allow Eni to increase its LNG portfolio and strengthen its gas foothold in the Eastern Mediterranean

Under this agreement, the plant will be 50% owned by Eni, 40% by EGAS and 10% by EGPC.

Al Molla meets European Union Ambassador To Consolidate Energy Relations

Eng. Tarek El Molla, has met the newly appointed European Union Ambassador to Egypt, Christian Berger, to discuss their partnership in the energy sector and how to boost it during the upcoming period.The meeting reviewed the significant relations between the two sides since the signature of the memorandum of understanding in April 2018. For his part, Berger said that Egypt is on the top of EU priorities to enhance the partnerships, pointing to the efforts of Egypt in the East Mediterranean region especially the establishment of East Mediterranean Gas Forum (EMGF) which positively affects regional cooperation.He called El Molla to conduct a virtual meeting with the European Commissioner for Energy, KadriSimson, to discuss more cooperation.In the same context, the two sides showcased the situation of using Hydrogen as a source of energy which is one of the cooperation areas between them during the coming period.

Technip FMC Starts Work on Egypt Hydrocracking Complex

Technip FMC has commenced work on a new hydrocracking complex in Egypt for Assiut National Oil Processing Company (ANOPC). The engineering, procurement and construction (EPC) contract covers new process units such as a vacuum distillation unit, a diesel hydrocracking unit, a delayed coker unit, a distillate hydrotreating unit and a hydrogen production facility unit, TechnipFMC pointed out in a written statement. The company added the project calls for other process units, interconnecting, offsites and utilities.According to Technip FMC, the complex will transform lower-value petroleumproducts from a nearby ASORC - Assiut Oil Refining Company refinery into approximately 2.8 million tons per year of Euro V diesel and other cleaner products.the EPC contract is worth more than $1 billion to TechnipFMC.

Al Mulla Gives Loyalty Shield To Former Oil Ministers

During the celebration of the 45th Petroleum Day, Eng. Tariq Al Mulla honored the former Ministers of Petroleum and Mineral Resources, Engineer Sameh Fahmy, Engineer Mahmoud Latif, Engineer Abdullah Ghorab, Engineer Osama Kamal, Engineer Sherif Hadara and Engineer Sherif Ismail.Al Mulla also honored the name of Eng. Ali Wali, Eng. Ahmed Ezz El Din Helal, Chemist Abdel Hadi Qandil and Dr. Hamdy Al Banabi.

bp announces gas production startup at Atoll-4, Qattameya fields

BP announced two important gas production startup milestones:Qattameyagas field in the North Damietta offshore concession, in which bp holds 100% equity in the concession located in Egypt's East Nile Delta. It is expected to produce up to 50 million cubic feet of gas/day.Atoll-4 which includes an estimated production of 105 mmscfd and 3,500 barrels a day (bpd) of condensate. Atoll 4 is tied back to the existing #Atoll facilities and will help to maintain Atoll field production of around 360 mmscfd. All gas produced will be directed to the Egyptian national grid.

Egypt awards 11 companies gold exploration blocks, launches second bid round

Egypt's Minister of Petroleum and Mineral Resources, Tarek El-Molla, announced that 11 companies won the first tender launched for gold exploration in the Eastern Desert.Four Egyptian and seven foreign companies have been awarded 82 blocks, representing 28% of the areas originally offered in the tender, El-Molla said in a press conference on Thursday. These companies have committed about $60 million in investments in the first phase of gold exploration. The foreign companies that won the tender include Centamin, Red Sea Resources, B2Gold, Lotus Gold, and Barrick Gold.El-Molla also announced the launch of the second bid round for gold exploration which will include 208 blocks over an area of 38,000 square kilometres in the Eastern Desert.

ARAB & INTERNATIONAL NEWS

US Federal Reserves likely to cut interest rates in upcoming meeting: Egypt's central bank

US Federal Reserve is expected to cut the interest rates in its upcoming meeting that will be held in December, which is its last meeting in 2020, in light of the US treasury bonds market performance and the downturn of proceeds curve, the Central Bank of Egypt (CBE) projected in its weekly briefing on the global markets.Global oil prices witnessed an increase by 7.16 percent in November ahead of the OPEC+ meeting that is anticipated to be held next week, which is expected to delay the oil production increase plan that was targeted in 2021, said the CBE.OPEC+ planned to increase its production with two million barrels per day (bpd) in January, which represents about 2 percent of the global oil consumption, after the significant decline in its production in 2020 on the wake of the oil price war crisis and the global lockdown procedures that the countries adopted to curb the spread of the COVID-19 virus.

UK's Energean eyes closure of Edison E&P purchase in December

UK-based Energean expects to close the transformational acquisition of Italian company Edison›s upstream business for $750 million in December this year.Under the amended agreement, the net consideration that would have been payable had completion occurred on Sept. 30 would have been $224 million, it said.The agreement came unstuck first when the Algerian government blocked the sale of Edison E&P's assets there and then Neptune Energy pulled out of deal to buy the Norwegian and

UK assets from Energean.The average Edison E&P production from the assets to be acquired under the amended deal in the first nine months was 48,100 b/d of oil equivalent, Energean said. Government approvals for the deal have been received in Italy, Greece and the UK, with approval in France expected imminently, it said.»Formal approvals from Egypt are still expected to be the last condition precedent to be satisfied for requirements associated with the closing process,» it said.Energean also said that in light of the challenging macro environment, Edison E&P is working closely with Italy›s Eni to «streamline» the Argo Cassiopea gas development project in Italy. First gas is now expected in 2024, it said.

Brent rises to highest since March after OPEC+ output cut deal

Global benchmark Brent crude prices rose 1% to their highest since early March on 3 / 12 on renewed hopes for a U.S. stimulus deal and after major oil producers agreed to increase output by a modest 500,000 barrels per day (bpd) from January. The increase means the Organization of the Petroleum Exporting Countries (OPEC) and Russia, a group known as OPEC+, would move to cutting production by 7.2 million bpd, or 7% of global demand from January, compared with current cuts of 7.7 million bpd.OPEC+ had been expected to extend existing cuts until at least March, after backing down from earlier plans to boost output by 2 million bpd. Brent futures rose 46 cents, or 1.0%, to settle at $48.71 a barrel, while U.S. West Texas Intermediate (WTI) crude gained 36 cents, or 0.8%, to a one-week closing high of $45.64.That is the highest settle for Brent since March 5 - before most countries imposed lockdowns to stop the spread of coronavirus. Republicans in the U.S. Congress struck a more upbeat tone on Thursday during coronavirus aid talks as they pushed for a slim $500 billion measure that previously was rejected by Democrats who say more money is needed to address the raging pandemic.

bp to Invest More in Middle East's 'World-Leading' Oil Fields

BP said it will invest more money in Middle Eastern oil and naturalgas fields even as it transitions to renewable energy and tries to lower emissions.The company is a major producer in countries such as Iraq, where it operates the world's third-largest oil field of Rumaila, the UAE and Oman. European oil majors are seeking greener sources of energy to combat climatechange. BP, which is selling assets and cutting its dividend in response to oil's coronavirus-triggered crash this year, is targeting a 40% decline in hydrocarbon production by 2030 and won't explore for crude in any new countries.In the Middle East, several countries are beginning to exploit renewableenergy resources and focus more on gas, the production and burning of which emits less carbon than oil or coal.BP's push in Iraq

is happening as rival ExxonMobil seeks to sell its stake in the country's West Qurna 1 field, which could fetch at least $500 million.

Chevron, Bahrain's Oil and Gas Holding Company sign joint study agreement

Bahrain's Oil and Gas Holding Co and Chevron Middle East have signed an agreement to conduct a joint study assessing future demand for gas in the kingdom and identify potential sources of supply, state news agency BNA reporte. BNA also reported that the Bahrain's oil minister welcomed the agreement, saying it would support the kingdom's efforts to develop the LNG sector.

Abu Dhabi boosts oil reserves with 22bn-barrel find

AbuDhabi has unveiled the discovery of 22bn barrels of unconventional reserves including shaleoil as the Gulf producer pledged $122bn in capital expenditure of its national oil company over the next five years. The emirate's supreme petroleum council said that it had also discovered another 2bn of conventional oil, bringing its recoverable reserves up to 107bn, the sixth-largest in the world.In a statement, Abu Dhabi National Oil Company said the 22bn in unconventional oil resources were larger than some of those in its conventional fields.Abu Dhabi will invest 448 billion dirhams ($122 billion) in oil and naturalgas over the next five years as it seeks to raise production capacity, even while OPEC restricts its output.

CORPORATE NEWS

Saudi Aramco's $8 bln bond issue attracts 150 investors

Saudi Aramco $8 billion senior, dollar-denominated bond issue attracted 150 new investors, Al Sharq TV reported, citing Khalid H Al-Dabbagh, Senior Vice President of Finance, Strategy and Development."The successful bond completion reflects investors' confidence in Saudi Aramco and the Kingdom's economy, and it implies Saudi Aramco's resilience amid the ongoing challenges, especially in the energy industry," Al-Dabbagh said.The $8 billion senior, dollar-denominated bond included a new tranche with a 50-year maturity, Al-Dabbagh said, adding that the bond issue completion reflects investors' high turnout and confidence in the company's position as well as future plans.Saudi Aramco announced the successful

completion of $8 billion senior, dollar-denominated bonds, unsecured by assets under its Global Medium-Term Note (GMTN) Program, data compiled by Argaam showed.

Petrojet to Take Part in Metro Fourth Line Construction With 3 Other National Companies

PETROJET has signed a contract to work on the first phase of Metro Line 4 which will link 6th October city to Cairo in cooperation with companies of Arab Contractors, Hassan Allam Holding, and Concord for Engineering and Contracting.The contract was signed by Petrojet's Chairman, WaleedLotfy, Head of the Egyptian National Tunnel Authority, EssamWaly and the Chairmen of the other companies.The project is funded by the Japan International Cooperation Agency (JICA).

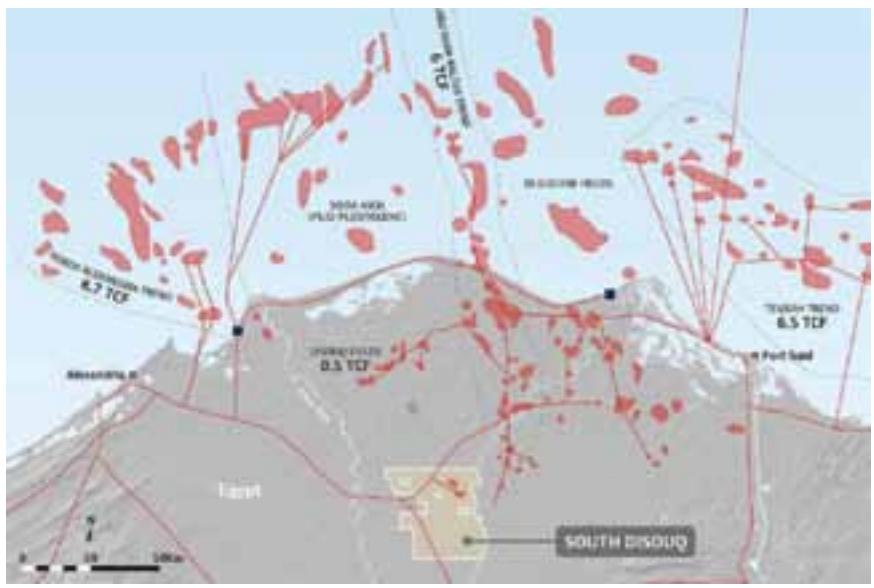
TransGlobe Sold 259,200 bbl to EGPC during Q3 2020

TransGlobe Energy Corporation announced, today, its financial and operating results for the three months ended September 30, 2020.In Egypt, the Company contracted a workover rig to perform well interventions at West Bakr beginning in September 2020, and continuing into the fourth quarter. The SGZ-6x well continues to produce from the Upper Bahariya reservoir, Western Desert at a field estimated rate of ~140 bbls/d light and medium crude to evaluate the zone.Production averaged 9,635 bbls/d during the quarter, a decrease of 18% (2,122 bbls/d) from the previous quarter. The decrease was primarily due to deferred well interventions in Egypt during low oil prices and natural declines. With the well interventions that began in September 2020, it is expected that production will be in-line with full year 2020 guidance, including South Ghazalat, of 11,200 to 11,600 bbls/d. Production in October 2020

averaged ~10,161 bbls/d. (Eastern Desert Concession). Production in October 2020 averaged ~142 bbls/d. (Western Desert Concession).The company sold 259,200 barrels of crude (bbl) to (EGPC) for net proceeds of $10.2 million in Q3 2020 with an average realized price of $37.15/bbl.

UK's SDX looks to accelerate Egyptian onshore gas exploration

SDX Energy Plc plans to accelerate new drilling at its flagship South Disouq concession onshore Egypt.SDX was bringing forward plans to drill new wells at South Disouq having identified significant additional prospectivity.»The most exciting well, without a doubt, for next year is a well we›re drilling at South Disouq called Hanut, which is targeting 139 Bcf of P50 prospective resources,» CEO Mark Reid said.SDX, which started production at South Disouq in November last year, identified the Hanut prospect over the summer after re-assessing data from other wells at the block.CEO Mark Reid saidHanut was similar to the Sobhi discovery made in April, «albeit quite a bit bigger.»»As a result, the right thing to do is to accelerate work given its size and put it into drilling for next year,



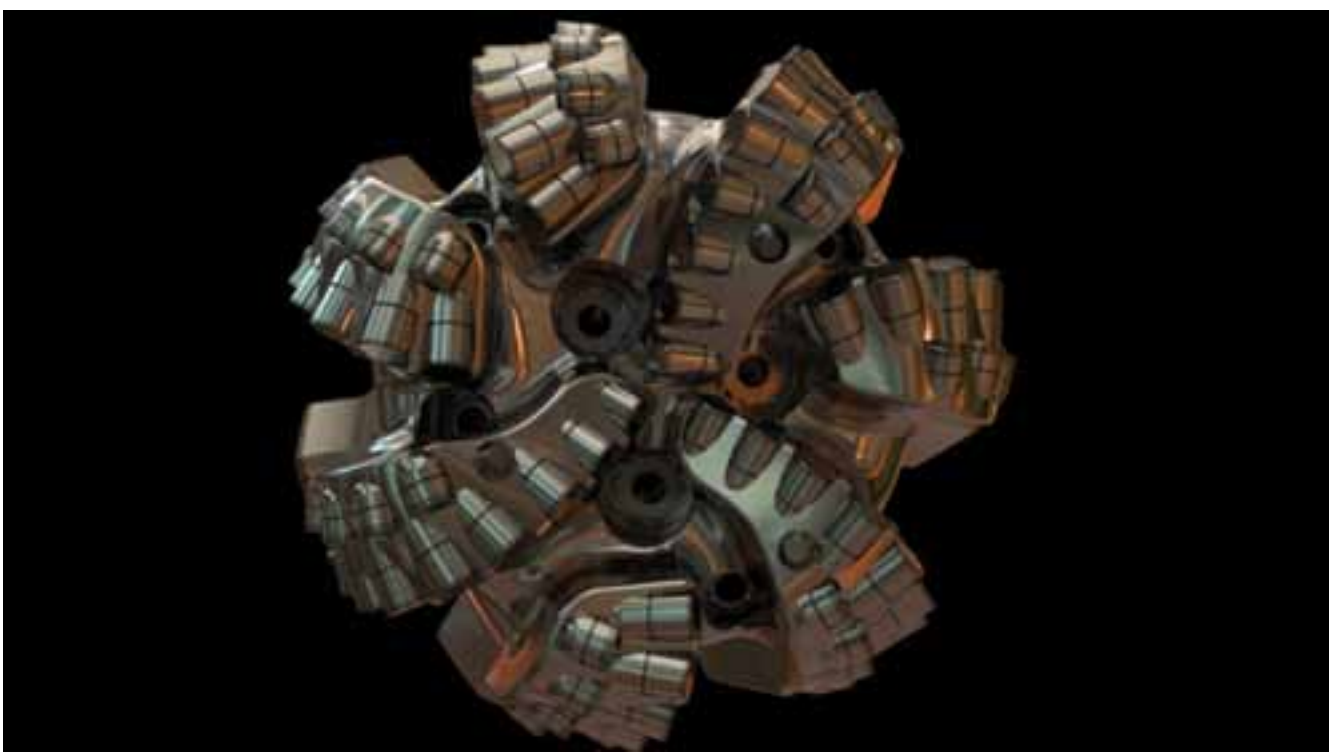
If the well is successful, it doubles our reserve base with one drill,» he said. SDX said gross production from South Disouq averaged 49 MMcf/d (1.5 million cu m/d) of dry gas and 467 b/d of condensate in the first 9 months of the year. That equates to 4,710 boe/d net to SDX.The company›s total production in the first half, including other assets in Egypt and its gas output in Morocco, averaged 6,646 boe/d, up 90% year on year.

Centamin Unveils Three-Year Plan for Sukari Gold Mine

West Africa-focused gold miner Centamin outlined a three-year plan designed to cut costs and boost efficiencies at its Sukari mine.The company said it would spend $595 million to increase waste stripping at Sukari, which is Egypt's sole gold-exporting mine and the first large-scale modern gold operation in the North African nation.Centamin's new plan would allow Sukari to produce between 450,000500,000- ounces of gold at an all-in sustaining cost of between $800-$900 per ounce from 2024 onwards.Chief executive

Martin Horgan told reporters on a call that the three-year guidance was characterized as an investment phase. "We are looking to reset the asset from a production basis [and focus] for now in margins and cash flow generation," he said.Analysts reacted positively to the news. UK investment firm Peel Hunt said the plan would be a "near term hit, [but] longer-term benefit." BMO said Centamin's near-term outlook was "realistic" and "should position the company well to achieve future guidance."The company, which has stepped up exploration across its three assets in West Africa, fended off a takeover attempt last year by Canada's Endeavour Mining.

Halliburton releases advanced drill bit with improved layout design



[Fig (1) Halliburton's new Stega drill bit.]

Halliburton has announced the release of Stega efficient layout design, an advanced drill bit that optimizes the placement of back-up cutters to improve bit durability without decreasing drilling efficiency or rate of penetration (ROP).

Traditional back-up cutters on polycrystalline diamond bits have many limitations such as increased heat and wear, poor bit cleaning and reduced ROP. To overcome these challenges, Halliburton designed the Stega bit with offset back-up cutters placed 180 degrees or more from the primary cutter. As a result, the new layout enhances durability with less cutter wear while maximizing drilling efficiency compared to traditional dual row or single row cutting structures.

"The development of Stega provides operators with the latest energy-efficient layout methodologies for targeted applications," said Scott Regimbald, V.P. of drill bits and services. "The advantages translate to extended bit life with no loss of ROP to help operators drill longer and faster while reducing costs."

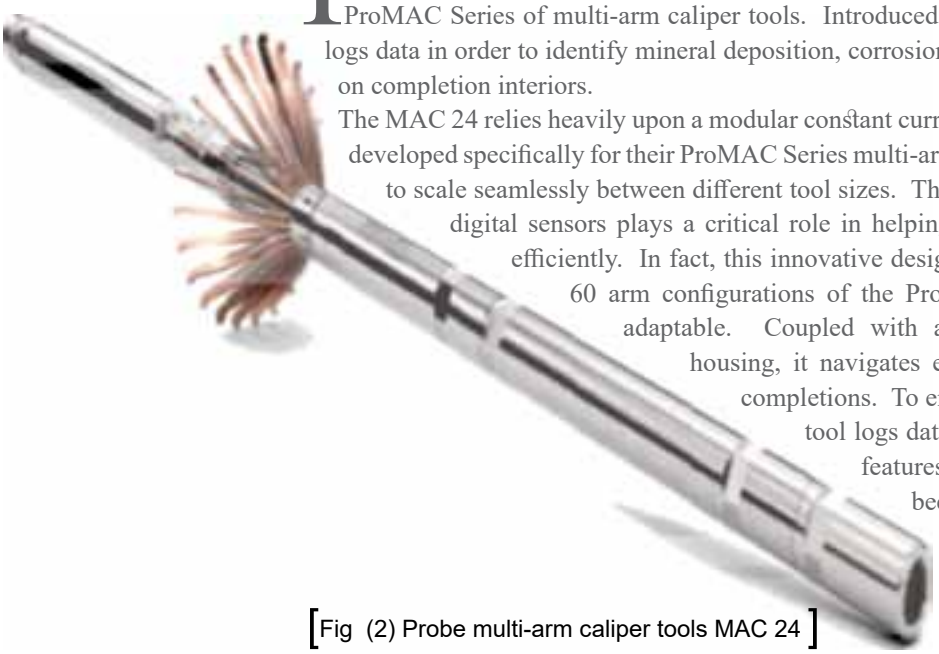
As cutters wear, more engagement area is exposed to rock and this increased area reduces cutting efficiency. A large portion of energy is lost as friction from the increased contact area takes away from the bit's ability to shear rock. Increased friction translates to heat culminating in a vicious cycle of rapidly increasing wear. Stega breaks this cycle by taking advantage of the bottom-hole pattern already created and removing load from the primary cutter before rapid acceleration of wear begins.

An operator in West Texas deployed the Stega bit in a harsh drilling application that historically used traditional non-Stega bit designs. Compared to the best performance of the non-Stega layouts, the Stega bit drilled approximately 40% (2,400 ft) further at an ROP that was 19% (15 ft) per hr faster. This resulted in valuable rig-time savings.

Improved completion integrity issue identification capability

Improved data logging efficiency and accuracy. This is what cased-hole logging specialist Probe set out to deliver when it developed its award-winning MAC 24, the first in the ProMAC Series of multi-arm caliper tools. Introduced this spring, the MAC 24 efficiently logs data in order to identify mineral deposition, corrosion, wear and mechanical deformation on completion interiors.

The MAC 24 relies heavily upon a modular constant current sensor architecture, which Probe developed specifically for their ProMAC Series multi-arm caliper tools that makes it possible to scale seamlessly between different tool sizes. This range of high-speed, configurable digital sensors plays a critical role in helping operators to log data much more efficiently. In fact, this innovative design will be available with 24, 40 and 60 arm configurations of the ProMAC Series, making it extremely adaptable. Coupled with a custom-designed small diameter housing, it navigates easily through the vast majority of completions. To ensure that every configuration of the tool logs data reliably and accurately, every tool features a special calibration bowl that has been precision-machined.



[Fig (2) Probe multi-arm caliper tools MAC 24]

Weatherford introduces Velox Wellhead System

[Fig (3) Weatherford Velox Wellhead System]

Weatherford International introduced the Velox™ wellhead system, a best-in-industry solution for operators needing to lock in pressure integrity while enhancing safety and improving efficiency. Velox delivers unmatched isolation between casing strings with quick-connect components that maintain pressure control, reduce potential leak paths, and minimize non-productive time during installation in many applications, including high-pressure, high-temperature, and sour-gas wells.

The Velox system expedites installation by enabling the packoff to be run in a single trip from the rig floor, which removes personnel from the cellar. The system also reduces potential leak paths by eliminating conventional flange-to-flange methods and external lockdown screws.

"The Velox wellhead system enables operators to lock in pressure fast," said Dean Bell, President, Drilling, Evaluation & Intervention, Weatherford. "Operators can run the upper and lower packoff assembly from the rig floor to isolate the annuli of multiple intermediate and production strings. The benefits combine to create one indisputable truth: Velox is best-in-the-industry for pressure control."

Wireline pressure testing service

[Fig (4) BHGE FTeX wireline pressure testing service.]

BHGE continues to develop enhanced methods for wireline formation pressure testing and fluid sampling. The company's new FTeX advanced wireline formation pressure testing service delivers pressure data by combining downhole automation with precise drawdown control, Fig. 3 BHGE claims the new service can obtain pressure profiles, fluid contact, and mobility information as early as the first logging run, because the service can be combined with other formation evaluation measurements.

Traditional wireline pressure testing services require significant manual control. Field engineers need to analyze initial formation responses and adjust test parameters to achieve stable conditions needed for accurate readings. This conventional process is prone to longer testing times and increases the risk of inaccurate or incomplete tests, especially in low mobility environments.

The new service includes artificial intelligence in the downhole system combined with precise control over the downhole pump, eliminating the need for manual control from surface. The system analyzes the pressure response 100 times per second and automatically adjusts the test parameters to optimize the test time and improve measurement accuracy. Results enable petrophysicists to make earlier decisions on meeting their evaluation objectives, BHGE asserts.

The service is fully combinable with BHGE's other wireline logging services, and has a smaller area of contact with the hole wall than other methods, reducing the risk of sticking.

The FTeX service has been deployed globally from offshore fields in the Asia Pacific region, the North Sea and the Gulf of Mexico to onshore fields in the Middle East and Latin America. Offshore Vietnam, the system performed 29 pressure tests in a well through a depleted, low mobility reservoir. With a drawdown rate of .004 cc/sec, a stable pressure measurement was achieved within 15 min. In a North Sea well with variable formation permeability, the system took readings at 50 pressure stations in 20 hrs, half the time required by previous methods. Also, BHGE reports that the system performed pressure tests at 200 stations in a Gulf of Mexico well in an average of six minutes per station in reservoirs with 0.1 to 1 mD/cp mobility.

Parker's SCFF couplings help protect the environment

[Fig (5) Parker's SCFF couplings]

Parker Hannifin is expanding its FlatFace offering with the SCFF series.

The SCFF series of couplings offers users a number of benefits ranging from low-leakage decoupling to the avoidance of air entrapment during coupling. The couplings, which are tested in accordance with ISO 7241 - 2, are easy to clean and very flat.

Whether being used in mobile hydraulics, transport, or the oil and gas industry, SCFF couplings are very resistant to vibrations and other forms of mechanical stress. The processes of coupling and decoupling are also fast and reliable: due to the inclusion of an ACME thread, no fluid escapes during these stages. The reliability of this system is enhanced by the swivel function together with the unique locking sleeve to avoid accidental disconnection.

SCFF plugs are available with pressure eliminator. Thanks to this innovative technology, it is possible to connect couplings in the presence of accumulated or residual pressure without any problems. A miniature valve automatically relieves the pressure in the connecting phase.

APS launches latest industrial battery charger

Applied Power Systems (APS), an industry leader in power conversion and energy storage solutions, has launched its latest three phase industrial battery charger, the BC-6964 Charger designed for hazardous location applications requiring Class I Div I or Div II equipment. The BC-6964 accepts 3-phase 60 Hz AC input and can be factory programmed to support multiple battery stack configurations, ranging from 12V@100A up to 72V@20A charging power. The charger provides seamless transition from a voltage source to current limit operation for optimum battery charging. In voltage mode, the Charger regulates to a factory set DC voltage. While operating as a voltage source, the Charger regulates its output voltage to provide optimum charging of the battery. If the output current demand exceeds a maximum setpoint, the Charger seamlessly transitions from voltage source to current limit, where the Charger folds back the output voltage to limit the current to the maximum charge current (Alimit). As the battery load decreases to less than Alimit, the BC-6964 will seamlessly return to voltage mode operation. The BC-6494 AC input voltage is EMI filtered and rectified to a high voltage of approximately 650 VDC, filtered and stored in a DC link capacitor bank. A high frequency IGBT full-bridge output inverter is pulse width modulated into the primary of a high frequency step down transformer. The transformer secondary is rectified, filtered and regulated to produce the precision Battery Charger output voltage. Input power is provided by 3-phase

AC input connections to an internal fuse block. Output charging power connections consist of two wire Battery connection terminals. Two 3 / 4» NPT conduit openings are provided to accommodate customer hookup. Optional USB and RS485 communication ports are available to provide remote monitoring of the Battery Charger operation.

EGYPT CELEBRATES 45th NATIONAL PETROLEUM DAY

Selecting November for the Petroleum Day celebration was not by coincidence. November 17, 1975 was the date that marks the restoration of all Sinai fields that were detained by the Israeli Army during the war. For 45 years, the petroleum calendar marked that day as the day of glory.

The day tells the story of one of the heroics of the Egyptian oil sector in the darkest circumstances experienced by Egypt. After the Egyptian sovereignty over the Sinai oil fields was restored.

The "Sha`ab Ali" field was taken from Israel on November 25, 1979, which Israel called "Alma field", during the tenure of Engineer Hamdi Al-Banabi as Minister of Petroleum at the time, and this was within

the fourth phase of the withdrawal after the signing of the peace agreement with Israel.

The field was received by the American company, Omco, which owns the concession in the area, Engineer Hamdy Al-Banabi, former Minister of Petroleum and President of GUPCO at that time, in a meeting that he said was the hardest during his career.

The field covered about 50% of Israel's needs of oil, and it was called "The Israeli treasure" and for this it was of prime importance in the Egyptian-Israeli peace negotiations.

Egypt and Egyptian Petroleum sector commemorated The National Petroleum Day, which has been suspended since 2011, this year on Saturday, November 28, at a time when the oil sector is witnessing a great boom of successes and achievements.

During the celebration H.E Tarek El-Mulla, minister of petroleum and mineral resources extended his greetings to all the sector employees, appraising the outstanding development rates the industry has witnessed. "The Egyptian petroleum sector has been blessed with a series of discoveries and attainments, which are the results of the vigorous efforts and strategies of the promising industry heads."

El-Mulla added that the utilization of up-to-date technologies and developing the different skills of employees were among the major factors behind the successfulness and richness of the petroleum sector.

NATA National Control Center

Engineer Tariq Al-Mulla, Minister of Petroleum and Mineral Resources, inaugurated the NationalControl Center of the National Network of Natural Gases "NATA" after its development in the presence of the former Ministers of Petroleum and Mineral Resources Eng. Sameh-Fahmy, Engineer Abdullah Ghorab, Engineer Osama Kamal and Eng. SherifHadara. The opening was also attended by Eng. AlaaKhashab, And Mohamed Gibran, president of the General Syndicate of Petroleum Sector Workers.

The minister and his companions from the former ministers, leaders of the Ministry of Petroleum and Mineral Resources, heads of bodies, clutches, companies and their deputies listened to an explanation from Eng. Yasser Salah, CEO of the Egyptian Natural Gases Company "GASCO", in which he explained that the modernization of NATA-

system came with the aim of linking with other systems to reach a unified vision for management The national network of natural gases, as well as implementing the policy of the Ministry of Petroleum and Mineral Resources in accelerating the application of digital transformation systems and developing work in the national network of natural gases.

The Egyptian Natural Gas Company (GASCO) is considered one of the first companies to implement the SCADA system in Egypt for more than 20 years, and the development of the SCADA system comes as part of the efforts to achieve integration between the information systems it uses, as the new system allows linking with the Geographic Information System (GIS) and displaying it at the control center.

The National Gas Pipeline Simulator, which helps those in charge of operating the national network at the National Control Center to monitor in real time and control the national network, take quick action in emergency situations, anticipate proactive scenarios, and conduct operating maneuvers to secure the supply of natural gas to customers.

For his part, H.E Tarek Al-Mulla stressed that the communication between generations and experiences exchange is a key feature of the oil sector, expressing his pride and appreciation to all former oil ministers and their distinguished efforts in order to achieve and face challenges, and appreciating their keenness to be present in This occasion, as he referred to the role of the petroleum sector supporting the state in the most difficult periods

over the past decades, starting from the glorious October War in 1973 through the recovery of the Sinai oil fields and many of the challenges that the Egyptian state faced.
Al-Mulla also reviewed what the oil sector has achieved during the past six years in various petroleum activities.

Al-Mulla pointed out that the oil sector enjoys continuous support and conscious follow-up from President Abdel Fattah El-Sisi, President of the Republic, and that the economic reforms implemented by the Egyptian state over the past years had the greatest impact in giving payments to the oil sector on its way to achieving success and proved its effectiveness during the Coronavirus pandemic that affected the world.

Egypt was one of the few countries that achieved positive economic growth, and the petroleum sector adopted the implementation of plans based on a balance between business and maintaining the safety of workers and developing work through an integrated digital system to support decision-making to be applied within the sector development and modernization project.

Al-Mulla to the sector workers: I respect your noble efforts

Al-Mulla affirmed his keenness to celebrate the Petroleum Day with respect and deep appreciation for the workers in the oil sector and their effort in various productive and service fields through mega projects and clear achievements, stressing the importance of their role in pushing the process of construction and development to achieve the elevation of the nation As they are the true wealth of the nation, the axis of development and a launching pad for a better future, expressing confidence in their commitment to positive participation in society and the commitment to apply preventive measures to preserve their safety in the face of the Coronavirus pandemic, and affirmed his appreciation for thier noble efforts.

A Cooperation Protocol between GASCO and PPC

During the celebration, Al-Mulla witnessed the signing of a cooperation protocol between **Egyptian Natural Gas Company (GASCO)** and **Petroleum Pipelines Company (PPC)** to develop the national Petroleum network, signed by engineer Yasser Salah, GASCO's CEO, and Engineer Emad Abdel Qader, PPC's CEO.

Al Mulla Gives Loyalty Shield To Former Oil Ministers

During the celebration, Eng. Tariq Al Mulla honored the former Ministers of Petroleum and Mineral Resources, Engineer SamehFahmy, Engineer Mahmoud Latif, Engineer Abdullah Ghorab, Engineer Osama Kamal, Engineer SherifHadara and Engineer Sherif Ismail.

Al Mulla also honored the name of Eng. Ali Wali, Eng. Ahmed Ezz El Din Helal, Chemist Abdel HadiQandil and Dr. Hamdy Al Banabi.

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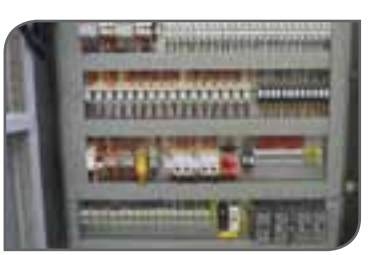

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What is **Next** for the **Middle East** Petrochemical Industry!

Middle East seeks refuge in petchems amid bleak oil demand forecasts

Despite global oil demand plunging an unprecedented 8% this year and drastic OPEC+ cuts, Middle Eastern energy producers are still counting on higher petrochemicals production to temper a bleak outlook for peak oil consumption that has spooked crude markets.

Even before the coronavirus pandemic, producers had little choice but to focus on petrochemicals, as the sector will account for 60% of global oil demand in the next decade due to rising consumption of plastics, according to the International Energy Agency.

In the last decade, road transport fuels represented 60% of oil demand. Probably for the first time, the IEA in this year›s annual World Energy Outlook indicated oil demand may plateau from 2030.

The IEA's view on petrochemicals growth resonates with that of the multilateral energy sector lender, Arab Petroleum Investments Corp. In its 2020 - 2024 gas and petrochemicals outlook published Oct. 12, Apicorp raised its forecast for planned petrochemical projects during the period by $4 billion from its previous estimate to $95 billion.

«By the end of this decade, most of the growth in oil demand will come from the petrochemicals sector,» Apicorp said. «The 2020 crisis and the delayed economic recovery might underscore this trend.»

Egypt, Iran and Saudi Arabia are the top three countries in the Middle East and North Africa in terms of committed petrochemicals investments, it added.

But the road to the predicted petrochemicals bonanza is pockmarked with financial constraints, geopolitical threats and competition among producers to supply a market grappling with peak demand scenarios and a pandemic that has no end.

Nevertheless, changing global oil consumption habits have led Middle Eastern oil producers to focus on integrating their large-scale refineries, with petrochemical facilities as a first step.

Asia and the Middle East, which accounted for two thirds of global refining investment over the past five years and for more than 80% of refining capacity currently under construction, will emerge by 2030 as the largest global refining centers, overtaking traditional ones, according to the IEA.

Aramco's refinery blues

As the world's top oil exporter, Saudi Arabia wants to a piece of this refining pie.

SAUDI ARABIA'S REFINING AND PETROCHEMICALS VENTURES THROUGH THE YEARS

1933	Oil concession agreement signed between Saudi Arabia and Standard Oil Company of California (SOCAL)
1945	Aramco's first refinery, Ras Tanura, comes on stream in Saudi Arabia
1983	Yanbu Refinery begins operations in Saudi Arabia
1984	SAMAREF joint venture refinery with ExxonMobil begins operations in Saudi Arabia
1985	SAMAREF joint venture refinery with Shell inaugurated in Saudi Arabia
1989	Aramco and Texaco ink deal for refining and marketing joint venture Star Enterprises, in US
1991	Aramco buys 35% stake in South Korea`s SsangYong Oil Refining Co. (renamed S-Oil in 2000)
1996	Aramco buys 50% of Greek refiner Motor Oil (Hellas) Corinth Refineries
2004	Aramco acquires 15% stake in Japan`s Showa Shell Sekiyu
2009	Petro Rabigh, Refining and petrochemicals Co. joint venture with Sumitomo, begins operations in Saudi Arabia
	Fujian Refining and Petrochemicals Co. (FREP) joint venture between Aramco, ExxonMobil and Fujian Petrochemicals Co., begins operation in China
2011	Sadara petrochemicals joint venture with Dow Chemical formed in Saudi Arabia
2014	Two refineries, SATORP joint venture with Total and YASREF joint venture with Sinopec, come online in Saudi Arabia
2017	Aramco becomes sole owner of Motiva, former joint venture with Texaco and Shell previously known as Star Enterprises
2018	Refining and petrochemicals joint venture with Petronas, PRefChem, in Malaysia is formed
2019	Aramco buys 17% of South Korea`s Hyundai Oilbank
2020	Saudi Aramco acquires a 70% stake in petrochemicals maker Saudi Basic Industries Corp. (SABIC)
	Jazan refinery in Saudi Arabia and PrefChem in Malaysia supposed to commence operations

Source: Saudi Aramco

In Saudi Arabia, the 400,000 b/d Jazan, refinery in the south is linked to a petrochemical facility. The start-up of the refinery, which was supposed to take place last year, has been postponed to this year.

The Jazan refinery is located in a region that suffers from sporadic missile and drone attacks from Iranian-aligned Houthi rebels in neighboring Yemen that are intercepted by Saudi defense, posing a potential threat to the facility›s existence, let alone supply agreements.

A piece of Aramco's downstream puzzle, Jazan will help the state producer reach 6.8 million b/d in gross refining capacity by the end of 2020. Aramco's refining business consumed 39.5% of the company›s crude production in the first nine months of this year.

But the business is a loss-making venture. Downstream EBIT in the first nine months of 2020 swung to a loss of Riyals 23.3 billion ($6.2 billion) from a profit of Riyals 4.87 billion a year earlier. Aramco blamed the dismal results on «the macroeconomic difficulties brought on by the COVID-19 pandemic.»

Although Aramco has promised a staggering $75 billion dividend this year to investors, it still has to prop up its existing refining and petrochemical projects. Aramco and Japan's Sumitomo Chemical will lend $2 billion to Rabigh Refining and Petrochemical Company, or Petro Rabigh, the Saudi joint venture that is facing a capital shortfall due to the pandemic and periodic maintenance.

Despite being in the red, Aramco's downstream business wants to expand globally as well. A 300,000 b/d refining and petrochemical joint venture project with state-owned Petronas in Malaysia was supposed to be up and running last year but has also been delayed to a 2020 start-up.

But the biggest setback to Aramco's petrochemical ambitions is its reassessment of a new $20 billion oil-to-chemicals project, a joint venture with Saudi Industries Corp., or SABIC, which the national oil producer acquired this year for $69 billion.

The two companies are now studying the integration of Saudi Aramco's existing refineries in Yanbu with a mixed feed steam cracker and downstream olefin derivative units, as an alternative to building a new plant.

The acquisition of 70% of SABIC was supposed to set Aramco on a path to become a petrochemical behemoth with combined production of 90 million mt/year.

Elsewhere in the Gulf, delays are besetting other refining and petrochemical projects. Kuwait›s

615,000 b/d Al Zour refining and petrochemical project is a decade late due to the country›s complex local challenges.

In Egypt, the ministry of petroleum and mineral resources is focusing on two integrated projects. One is an $8.5 billion complex in Al Alamein in the Western Desert that includes a 2.5 million mt/year crude and condensate refinery. The project, which is expected to be completed by 2024, will meet local petrochemical demand and could also export products.

Another $6.2 billion project in the Suez Canal Economic Zone is expected to produce up to 1.9 million mt/year of petrochemicals and up to 900,000 mt/year of refined products. The project would import crude to process into petrochemical and refined products.

The two complexes are part of 11 projects that are on the cards, costing $19 billion in total,which will increase the capacity of refineries to more than 41 million tons annually.

Egypt, which wants to wean itself off refined products imports by 2023, consumed 30.2 million tons per year of oil products in 2019, nearly a third of that coming from imports at a cost of $6.8 billion, according to the petroleum ministry.

But financing for these large-scale projects may be a hurdle, given the country's reliance on foreign debt.

These projects come within the framework of the Ministry's keenness to develop the refining and petrochemical industries in Egypt and to increase the petroleum and petrochemical products production.

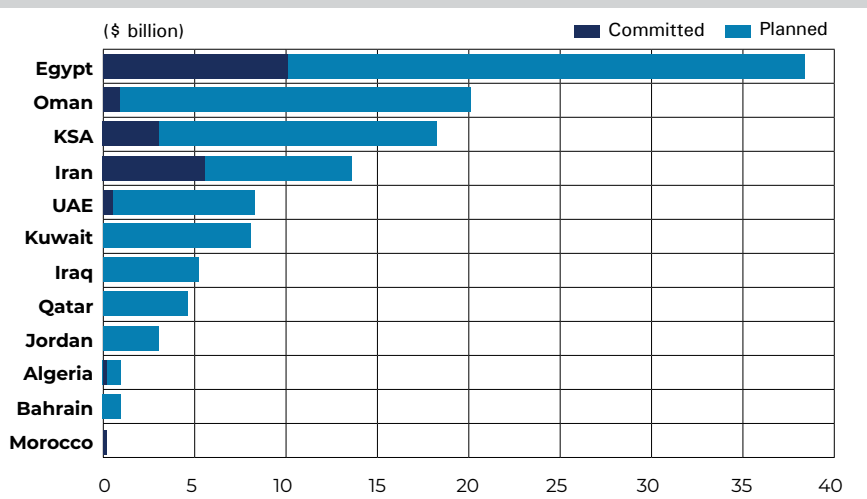
In the UAE, Abu Dhabi National Oil Co.›s strategy to attract $45 billion in investments to its downstream sector in partnership with international oil companies has yet to yield big tickets deals. The company's push to double its refining capacity and triple its petrochemical production capacity has no set timeframe.

In Iran, the government is even more keen to boost its petrochemical profile because its energy industry is buckling under the weight of US sanctions, re-imposed in 2018. Iran increased its petrochemical output by 8% in the seven months ending October in its fiscal year that started in March 2020.

Petrochemicals revenue could help compensate from losses arising from lower crude sales, which have plunged since the re-imposition of sanctions. Iran, which produced 66 million mt/year in its last fiscal year, wants to reach 100 million mt/year by March 2022, generating $25 billion in revenues, and even hit 133 million mt/year by March 2025.

However, production from the Middle East will be competing with Asian output in the coming years, as both regions vie to become petrochemical giants at a time when peak oil demand is predicted to be just around the corner. And amid the ongoing coronavirus pandemic, finances will continue to be slim, jeopardizing the grand plans of both regions when they most need a boost.

MENA PETROCHEMICAL INVESTMENTS 2020 - 2024



Source: Arab Petroleum Investments Corporation, Gas & Petrochemicals Investment Outlook 2020 - 2024

The Libyan wild card: ‘Real’ crude production to reach 1 million bpd by February 2021

In an already devastating year for the oil market, Libya delivered a supply shock in October by not only lifting a nearly 8-month oil blockade but also ramping up oil production at breakneck velocity. A Rystad Energy analysis of Libyan infrastructure and needed maintenance finds that the country’s crude oil output is set to average around 750,000 barrels per day (bpd) in November and only climb to 1 million bpd in early February 2021.

The forecast, our current base-case scenario for the country, reveals a remarkably swift build-up for Libya’s oil output, which we estimate stood at about 375,000 bpd on average during October. With each day, there are reports that production keeps climbing, but we believe these estimates have been exaggerated and represent oil production capacity coming online rather than ‘real’ production numbers.

On 23 October 2020, Libya’s National Oil Company (NOC) announced it was lifting force majeure on all oil export terminals and infrastructure after the latest round

of peace treaty meetings in Geneva proceeded positively. After force majeure was lifted, Libya's ports – including the biggest export hub Es Sider – resumed cargoes, prompting oil production to reach an estimated 620,000 bpd to 650,000 bpd.

On 26 October 2020, NOC also lifted the force majeure from one of the biggest oil fields in western Libya, the 70,00075,000- bpd capacity El Feel field, which is operated by Mellitah Oil & Gas. The field is reportedly gradually ramping-up to its pre-shut-in capacity. The El Feel oil field depends on the Akakus Oil-operated El Sharara oil field for electricity supply for its operations.

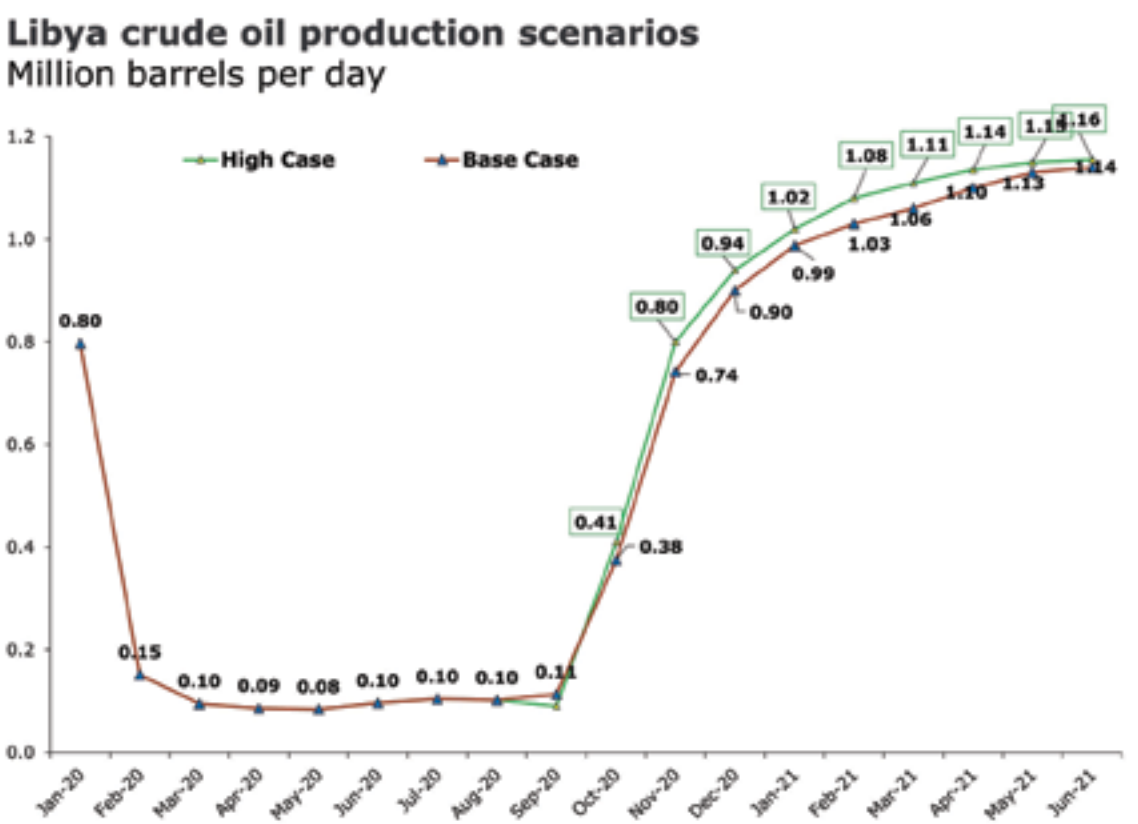
El Sharara is also gradually ramping-up after force majeure was lifted on 11 October 2020, and we estimate crude production from the field has reached 130,000140,000- bpd and will continue to ramp-up gradually throughout 2020 as long as force majeure isn't re-imposed or other forces, market-driven or political, curb production.

"The ramp-up from the El Sharara field is estimated to be slower due to lack of maintenance during the prolonged shutdown. Currently, we see Libya reaching 1 million bpd only by early February 2021, as maintenance and work-over needs to be sufficiently conducted across all the fields and oil transport pipelines," says NishantBhushan, oil market analyst at Rystad Energy.

While maintenance logic points to our base-case scenario, there is an unlikely possibility that El Sharara could ramp up more rapidly to 200,000230,000- bpd capacity by mid-November and other fields of major operators like AGOCO and Waha Oil could ratchet up production at a faster pace than currently demonstrated. Only in such a scenario, a high-case one, do we see the possibility of Libya exiting 2020 with production already surpassing 1 million bpd.

This hinges upon a very successful ramp-up with very few hiccups in the coming weeks at all fields that have been able to resume activity, a difficult task.

In any case, Libya's great comeback story is a thorn in the side of the OPEC+ group, which is already struggling to keep oil prices afloat amid non-compliance among members and a deteriorating demand backdrop. Libya adding another 300,000400,000- bpd of oil to an already oversupplied market would further skew the supply-demand imbalance and put another layer of downside risk on oil prices.



Source: Rystad Energy GIS Services, Rystad Energy OilMarketCube, research and analysis

Risk Mitigation in Overpressured Wells Through Geomechanical Approach

By: Olga Carvajal, Baker Hughes; Camilo Sierra, Lewis Energy Group

Abstract

The geological evolution of the northern region of Colombia has resulted in lateral/oblique compressionalstresses leading to the development of tilted faulted blocks and associated subsidence, followed by intensefolding/uplift that has impacted the stress regime and the pore pressure evolution. Previous pore pressureprediction approaches often considered a shallow overpressure associated with a high fracture gradient (FG),and thereby allowing an assumption for a wide operational mud window. Drilling experiences however,indicated a contrasting scenario and thereby a better understanding and a more accurate estimation ofoverpressure and FG became necessary.

With the aim of optimizing drilling operations, a geomechanics analysis was conducted, based onexisting information incorporating local geological inputs and production well data, in order to better predictwellbore stability, pore pressure, fracture gradient and to identify related drilling risks for the planned wells.

The resultant geomechanical model confirmed the presence of shallow overpressure development, theoccurrence of which, along with its distribution and magnitude, is mainly controlled by the geologicalevents (especially uplifting) that shaped the basin. Subsequent updates of the model managed to explain thefrequent occurrences of water inflows, gas kicks, high volume of losses (a gain-loss situation) and instabilityrecorded in previous wells. It also predicted a feasible but conservative mud weight window for the wells inthis field. Understanding the geological evolution allowed for a better comprehension of the stress regimechanges over time. Through an enhanced understanding of the geological and geomechanical influences, arisk mitigation strategy was developed to proactively reduce pore pressure and wellbore instability relateddrilling effects encountered in the earlier wells.

So far, well schematics and mud weight windows have been optimized in five wells through utilizing thisgeomechanics approach to deal with the challenges imposed by a narrow mud window. The planned wellshave been successfully drilled in record time with no major drilling problems by using the recommendedmud pressures and optimized drilling practices.

Introduction

According to the most recent data in BP›s Statistical Review of Energy (BP, 2019), most of the gasconsumed in Colombia comes from fields experiencing production declines (Cusiana, Cupiagua and Chuchupa-Ballenas), putting pressure on the country to find and produce new gas resources. The currentNational Government commitment is to reactivate the hydrocarbon sector and develop new sources to allowColombia to ensure its power self-sufficiency.

The northern region of Colombia is considered as an area with high potential for gas production. Differentcompanies have explored this area since the XIX century (Niño et al, 2004). Drilling and commercialexploitation of these gas resources has posed significant challenges due to downhole drilling problems suchas wellbore instability problems and fluid loss events in part due to its geological complexity.

During well operations, an improper mud window can lead to wellbore instability issues, unexpectedinflows, downhole mud losses or, in critical scenarios, to a well abandonment. Understanding the drillingrisks based on past drilling experience is a key element for a reliable mud window and good exploitationstrategy. Effective risk reduction and risk mitigation procedures can then be implemented and the wellcompleted safely, within a cost effective drilling program. The procedures outlined in this paper discuss the positive impact of integrating geomechanics, geologyand drilling data during development of the field.

Geological Setting

The field is located in the northern part of the geological province San Jacinto Fold Belt (SJFB), which inturn is located to the NW of the Lower Magdalena Valley basin (VIM).

The geological evolution of the Colombian north region is complex and related to the development of theCaribbean Plate and its interaction with the Cocos, Nazca and South American

plates (Caro & Sprat, 2003).Evolution of the SJFB belt has been controlled by extensional and compressional events and the subductionof the Cocos and Nazca plates beneath the western and southwestern edges of the South American plate.These events have resulted in shear and compressional stresses, tilted blocks (presented as tectonic andstratigraphically differentiated regions, each separated by regional unconformities, established from seismicand well data) and subsidence followed by intense folding and uplift (Reyes et al. 2004, Figure 1). Theregional unconformities reflect tectonic events but they cannot be easily identified in the seismic profilesdue to poor imaging and structural complexities.

The main potential reservoirs are siliciclastics rocks deposited during the Eocene - Miocene. Thesedeposits vary from continental to fluvial-deltaic to marine sediments including shallow water carbonatedeposits. Abundant oil and gas shows, clastic and carbonate deposits, together with strong structurationindicate a high prospectivity area. Overlapping sealing units are present in the entire basin. The seals areassociated with translapping or migration of facies changes from marine to continental environments.

Methodology

In the present study, a geomechanical model was developed for three offset wells (OW-1, OW-2, OW-3) andverified against the available data. The final calibrated geomechanical model was then utilized to conductwellbore stability analysis, mud weight planning and casing design optimization for a planned well. Thefollowing workflow summarized in Figure 2 allowed obtaining a calibrated geomechanical model thatexplains the issues experienced during drilling wells in the field.

Data Audit. A geomechanical model is built by analyzing and integrating information from differentsources. Relevant data were selected and gathered, such as daily drilling reports, master logs, wireline logs,geological data and reports, petrophysical interpretations, seismic data, and general field information. Thosedata were analyzed and cataloged to establish data availability and quality.

Consolidation of Existing Drilling Experience. Drilling experience in the offset wells is a valuable toolfor calibrating the geomechanical model. Drilling data is collected from daily drilling reports, fluid reports,time incident logs and final well reports. Days versus depth plots displayed the drilling history where themajor nonproductive events are related to gas kicks and water inflows, severe losses and tight hole/overpulland pack-offs.

One of the three offsets analyzed (OW-2, Figure 3) started experiencing major drilling problems at a veryshallow depth (less than 1000 ft) from where a combination of severe instability issues, losses and porepressure related events turned very difficult reaching the final depth. OW-1 (Figure 4) experienced the sameissues but in this well the pore pressure related events started below 5000 ft.

Finally, the identified drilling events are cross-referenced to the geomechanical study to highlight areasof risk and validate the geomechanical analysis.

Construction of the 1D Geomechanical Model. A geomechanical model comprising the vertical, themaximum and minimum horizontal stresses, stress orientation, pore pressure as well as rock mechanicalproperties (strength and elastic properties) was constructed for the field using the data from three key wells.

The vertical stress (Sv) was calculated from the integration of the bulk density logs. A power lawrelationship was fit to the density log up to the surface to fill in the gaps in the shallow section.

The formation pore pressure was determined from log data (gamma, sonic, resistivity) supplementedwith formation test data, time incident logs, mud weights and well control incidents. Significant time wasinvested to integrate all the available data and overpressure indicators to establish pore pressure profilealong the three wells. For claystone lithology, a Normal Compaction Trendline (NCTL) method based onacoustic, resistivity and density logs was utilized. For permeable layers, it was found (based on the gas-water inflows analysis, the pressures registered during well control and the seismic data) that secondarymechanisms such as centroid and buoyancy effect control abnormal pore pressure. The model estimatedthat the overpressure commences at shallow depths in Porquero Formation and its magnitude depends onhow each well is located in the structure (Figure 5).

Mechanical rock properties were derived from acoustic logs using empirical correlations. The unconfinedcompressive strength obtained indicates rocks with low to intermediate strength. The minimum horizontalstress (Shmin) was inferred from drilling reported problems and induced losses experienced during wellshut-in for well control (Figure 6). No LOT/XLOT and minifrac data were available to constrain Shmin.

The maximum horizontal stress (SHmax) azimuth of approximately 130° was estimated from scarcebreakouts identified in image logs. This parameter involves uncertainty that currently has low impact duringthe well planning because the wells are mostly vertical but it needs to be addressed as new data comes.

The presence of breakouts was used to forward model the magnitude of SHmax. A combination offrictional faulting theory and borehole breakouts analysis were used to constrain the magnitude of SHmax(Zoback et al., 2003). Stress polygons were constructed at a single depth where wellbore failure wasobserved. The stress polygon was constructed for the mud weights used during drilling, the observed

pore-pressure conditions, and rock properties. Contour lines of compressional rock strength were superimposedon the stress polygon to take into account the occurrence of stress-induced wellbore failure. The resultantgeomechanical model indicates a strike slip regime (SHmax > Sv > Shmin) in the field with large horizontalstress differential.

The constructed model was verified and calibrated against drilling incidents, caliper and image logsavailable in the three offset wells to guarantee that the model predicts the drilling problems (instabilityissues, losses and pore pressure related events) and borehole enlargements.

Predrill Model. After the completion of the geomechanical model, a wellbore stability and pore pressureprediction was conducted for the N1 planned trajectory to evaluate potential drilling risks. Cross seismicsections were analyzed in order to estimate the overpressure due to centroid effect and buoyancy secondarymechanisms based on the nearest offset well (Figure 7).

Figure 8 (left) shows pre-drill collapse pressure, pore pressure and Shmin as well as the proposed casingprogram for N-1 trajectory. Figure 8 (middle) also shows the post-drill updated mud weight window forthe same trajectory. Direct pore pressure measurements of up to 17.8 ppg in the N-1 well confirmed thehigh overpressure predicted in the reservoir section. No major events or severe gain-losses situations werereported in N-1 well. Partial losses at the permeable intervals in the second section would obey to fracturesbeing critically stressed due to a high mud weight of 14 ppg (Figure 8, right).

Drilling Optimization. The wellbore-stability analyses captured crucial information about potentialdrilling hazards and provided the basis for drilling optimization. The geomechanical model has beenprogressively updated based on the post-mortem of five wells. These updates have validated the criteriaestablished in the first study. The proposed mud type, weight and seal strategy aimed reducing instability,inflow and losses risk, costs and improving drilling performance. The proposed well schematic make themud window in the second section wider reducing the risk of induced losses. It was recommended to controlECD within the safe operating window and guarantee the shut-in closure pressure below Shmin in the eventof a well control to reduce the risk of induced losses. Mud weight, fluid rheology and flow rate were foundas the critical parameters that together with hydraulic simulations help to assess the risk of losses.

Key Findings

This analysis confirmed the presence of a shallow overpressure which occurrence, distribution andmagnitude is controlled by the same geological events (uplifting specially) that shaped the basin. Thereare strong indicators that overpressure in the offset wells (located very differently structurally) obeys toundercompaction, lateral transfer & buoyancy effects, together with a complex tectonic geological process.The narrow mud window estimated in the offsets explained straightforwardly the gain-losses situationsrecorded: high shut-in pressures during well control and/or pack-offs operations might induce breakdownresulting in high volumes of losses and subsequently gains.

Conclusions

A 1D geomechanical model was developed and used to design a mud weight program for planned wells in ageologically complex field. The developed geomechanical model was able to explain the wellbore instabilityissues, severe losses, inflows, and the gain-losses situation, previously misinterpreted as ballooning effect.

The integration of drilling data, geological data and geomechanics allowed visualizing the potentialdrilling risks in this field. Well planning involved better communication between drilling and geologydisciplines and subsurface allowing improving strategies to effectively mitigate the risks.

Geomechanics is becoming a critical design tool for well planning, drilling optimization, production,completion and stimulation programs in conventional and unconventional plays. It can improve efficiency,reduce costs and risks, enhance well productivity and reservoir recovery (effectiveness), and maximize theassets› net present value.

So far, well schematics and mud weight windows have been optimized in five wells through thegeomechanics approach to deal with the challenges imposed by a narrow mud window. The planned wellshave been successfully drilled in record time with no major drilling problems by using the recommendedmud pressures and good drilling practices.

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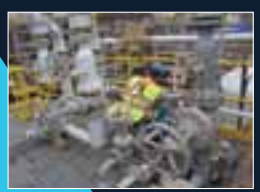

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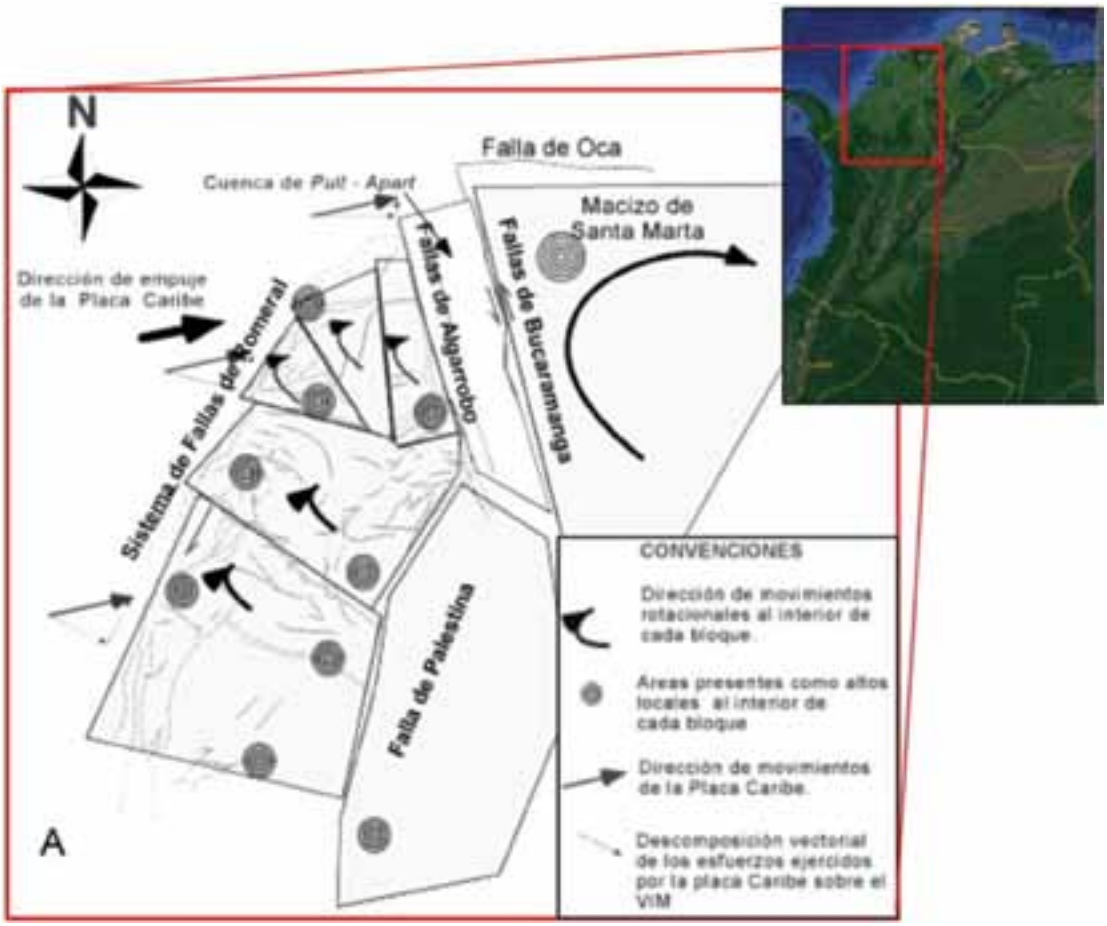

Figure 1—Blocks rotation model (edited from Reyes et al. 2004).

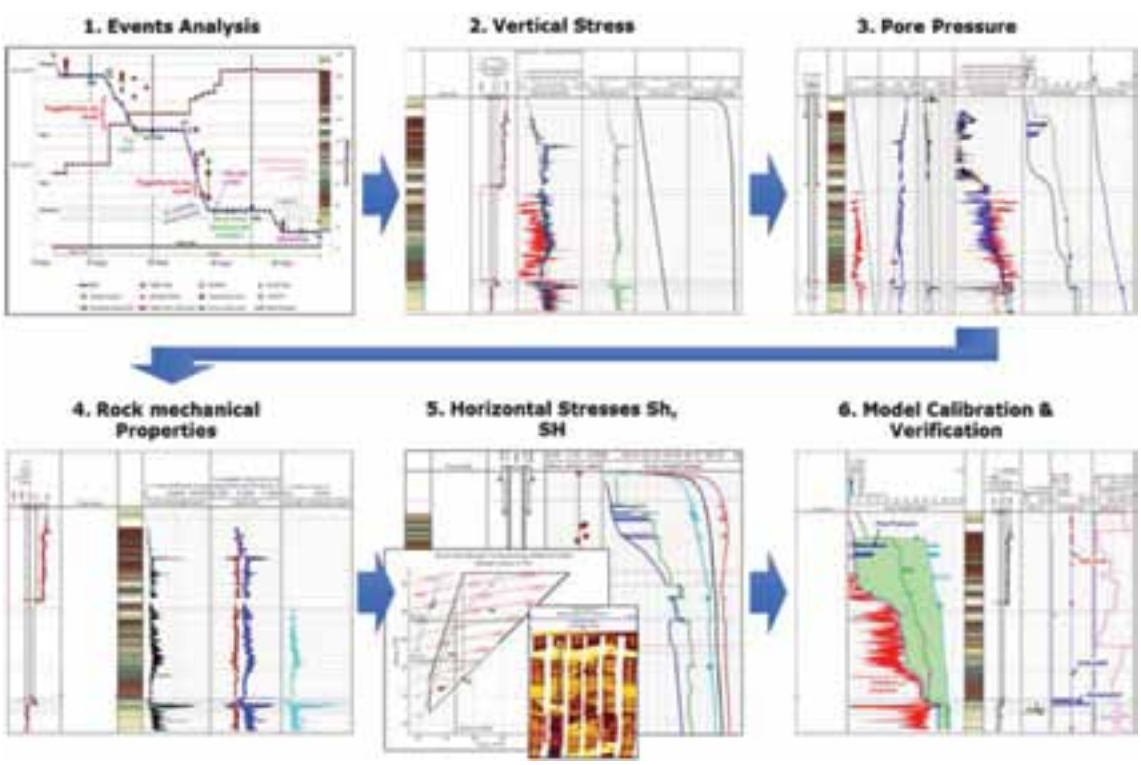

Figure 2—Geomechanical Modeling Workflow

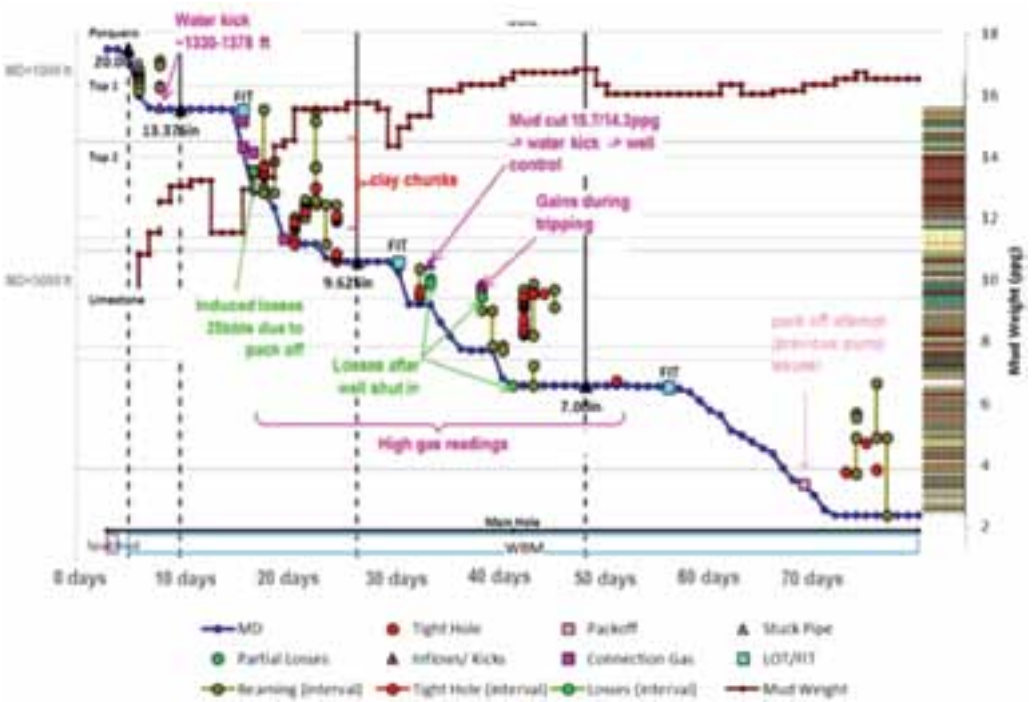

Figure 3—Drilling Summary OW-2 well. Days vs. depth plot created during evaluation of the drilling history

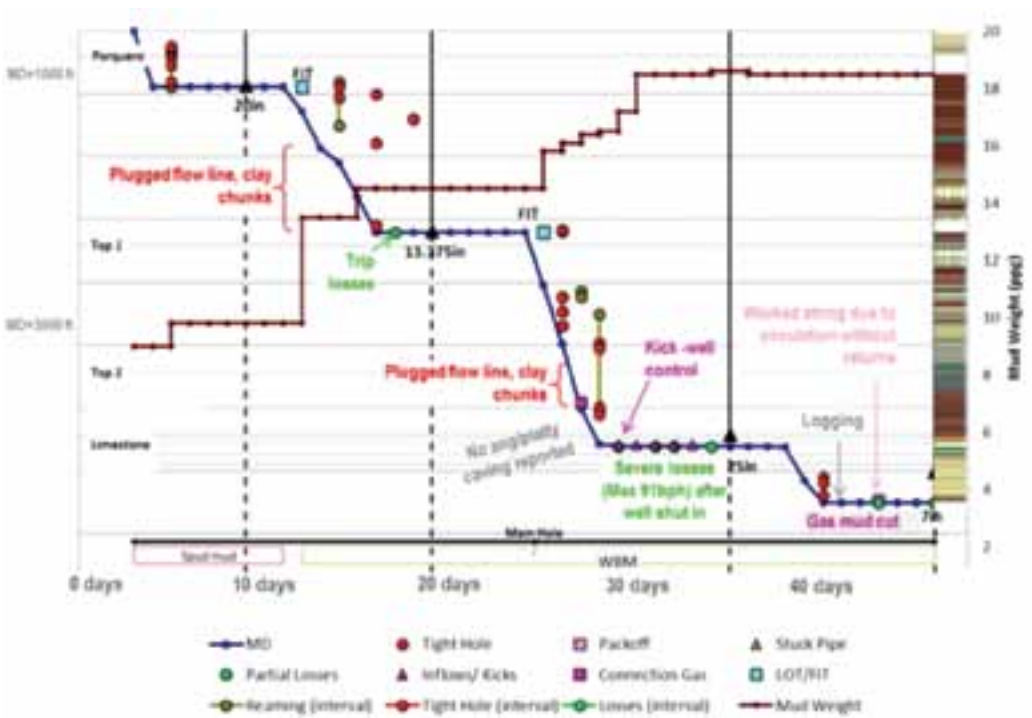

Figure 4—Drilling Summary OW-3 well. Days vs. depth plot created during evaluation of the drilling history.

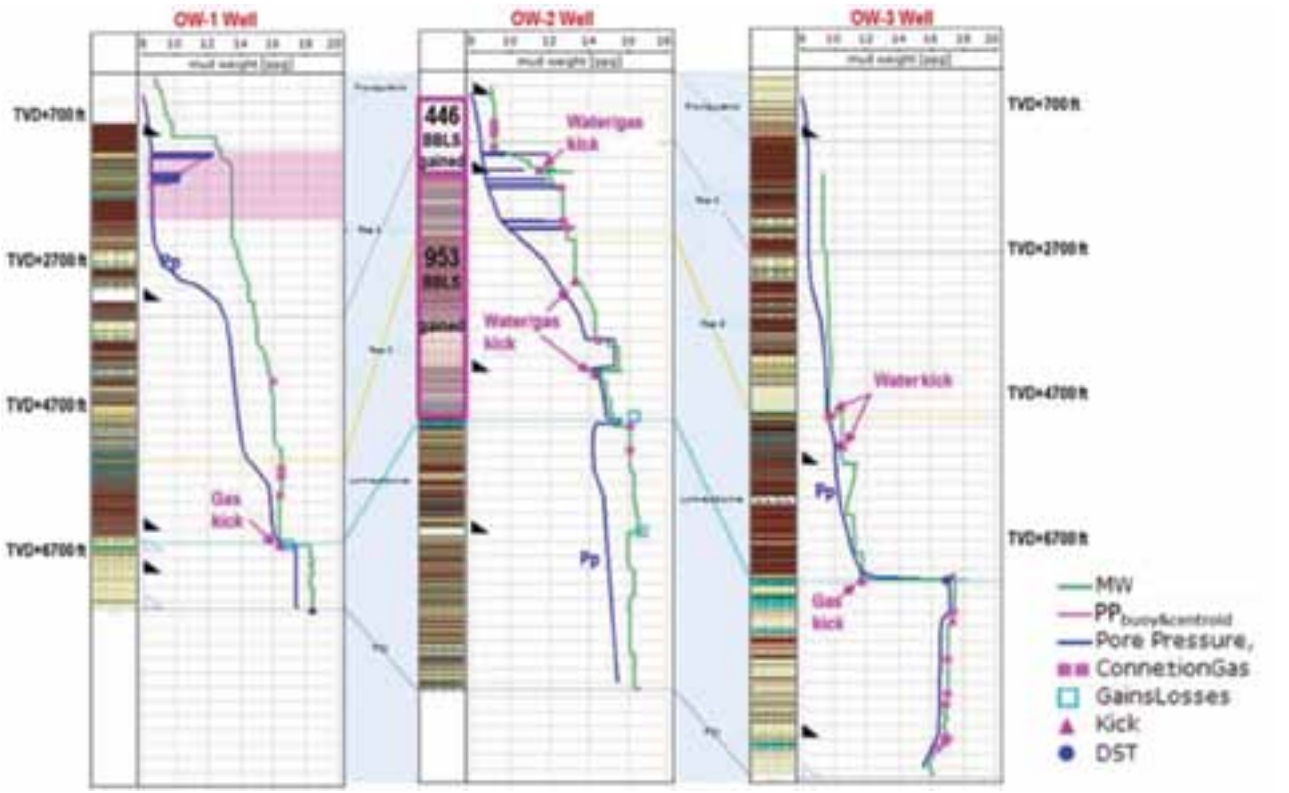

Figure 5—Pore pressure model.

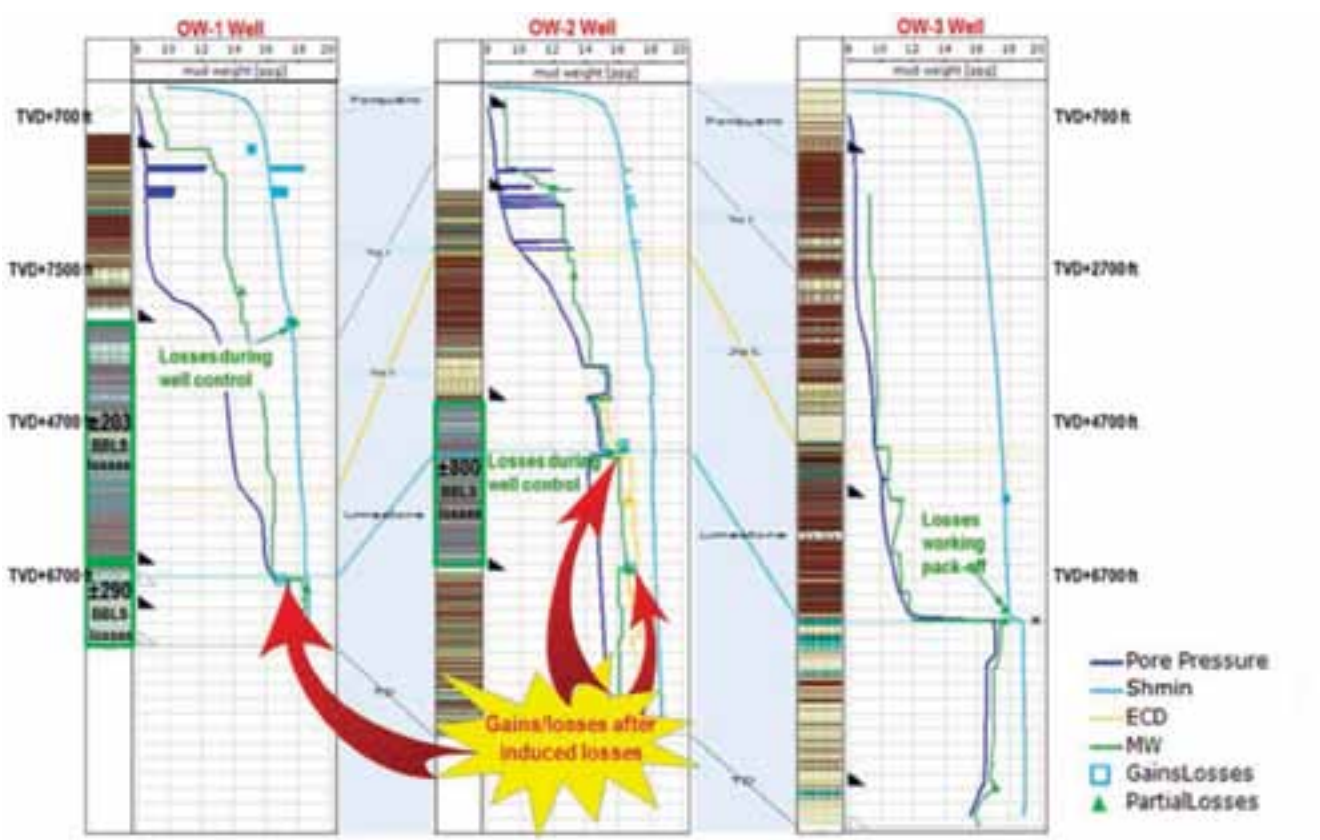

Figure 6—Pore pressure and Shmin model.

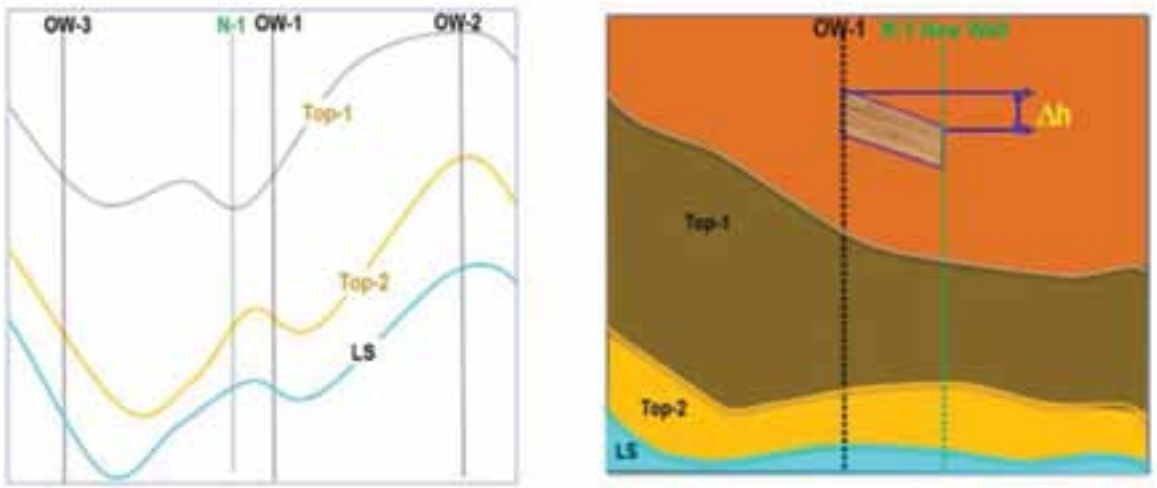

Figure 7—Schematic cross sections showing the offset wells (left) and the nearest well to N-1 planne trajectory (right).

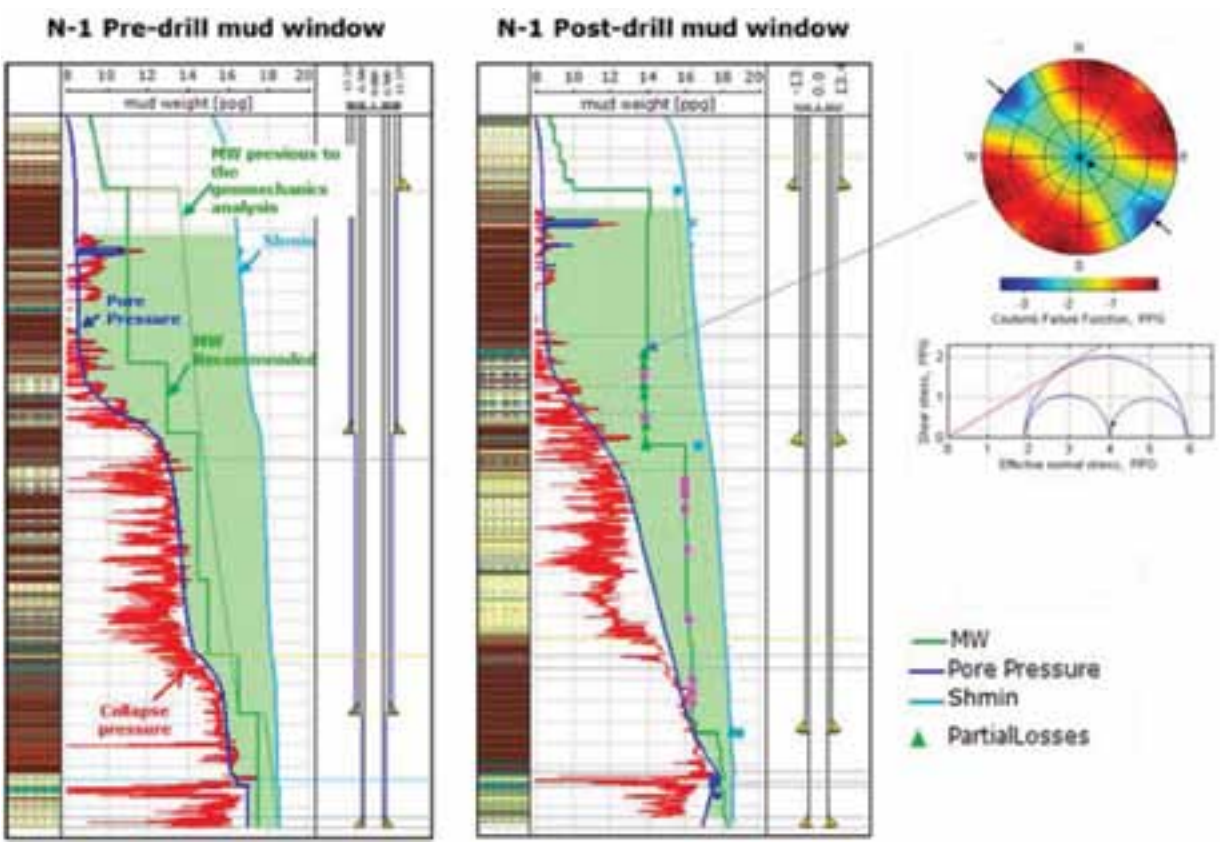

Figure 8—Mud window in the planned trajectory (left) and after the post-mortem analysis (middle),and a critically stressed natural fractures scenario for the permeable interval in the second section.

Enhanced Augmented / Mixed Reality and Process Safety Applications

By: Jeff Potts and Terrance Sookdeo, Baker Hughes, a GE company

Abstract

Effective management of process safety risks while delivering flawless operational execution in an evolvingoil and gas industry requires innovative applications of digital technology. Augmented Reality (AR) or Mixed Reality (MR) technologies have tremendous potential to meet these challenges by providingrealworld digital landscape to intuitively interact with data, train personnel, and mitigate process safety risks.

However, a major challenge with AR and MR technologies is the limited processing power and capabilityof available hardware. A cloud-based software platform can overcome these computational limitationsof AR and MR devices, enabling interaction with significantly more complex 3D content. Additionally,enabling real-time connectivity across different hardware architectures – such as smartphones and MicrosoftHoloLens devices – creating powerful new capability for remote collaboration. This unique softwareplatform transforms consumer-grade AR and MR devices into powerful industrial tools for oil and gasapplications.

This paper will illustrate the application of AR/MR technology in critical risk management includingthe adoption of AR/MR technology for process safety operational readiness and response capability tocritical risk associated with major accident hazards. Enhanced AR/MR provides full-scale virtual digitallandscapes that enable practical demonstration of crew resource management including the evaluation ofcollaborative human performance in teamwork activities. Using gamified AR/MR techniques, allows formultiple outcomes based on user inputs to test decision-making and eliminate human errors. These enablingtechnologies can drive significant improvements in process safety risk management while increasingoperational efficiencies across the oil and gas industry.

Introduction

There is a spectrum of Extended Reality (XR) technologies to choose–from low-immersion, high-portabilitydevices to highly immersive, low-portability headsets. XR can be segmented into three broad categories:augmented reality (AR), mixed reality (MR), and virtual reality (VR), although these divisions are notalways clear-cut. From our perspective and experience, and after internal surveys across the oil and gaslandscape, AR/MR is the segment of this space of particular interest for industry application due to theergonomics and portability of these devices, coupled with their ability to effectively superimpose digital content on top of the physical world. However, the downside of this increased portability is limitedcomputational power due to form factor and battery life limitations that restrict the capability of AR andMR devices to render highly complex 3D models or interact with large data sets.

In response to the industry demand for these technologies coupled with a need for high-fidelity content,we sought to overcome the technical limitations of currently-available AR and MR devices by building asoftware platform that enhances the capability of these devices, effectively bridging the gap between AR/MR and VR. The technical details involve offloading processing from the AR or MR device onto a morepowerful server, then streaming back to the client AR/MR device over a wireless network. This approachnot only lifts computational restrictions of these native devices, it enables increased collaborative and cross-platform functionality.

Technology Overview

The platform architecture increases the effective rendering capability of AR/MR devices. Natively, a devicelike Microsoft HoloLens can render 3D models consisting of up to approximately 100,000 polygons andprocess graphics more than adequately for many light applications such

as internet browsing, and basicholographic overlays on physical equipment.

However, models generated from real-world datasets such as computed tomography (CT) scans as wellas complex computer-aided-design (CAD) models (e.g., BHA assemblies, wellsites, refineries, etc.) caneasily exceed this threshold by orders of magnitude, making interaction on lightweight platforms like theHoloLens, smartphones, and tablets impossible. The cloud-based application increases native processingcapability 100 times for greater than 10,000,000 polygons. Figure 2 shows a core sample dataset nativelyvisualized on the HoloLens using its on-board graphics processing capability, compared with the samedataset visualized on the same HoloLens but streamed to the headset with remote rendering. The userexperience in both cases is indistinguishable, but the streaming architecture enables a much richer interactionwith the full dataset as compared to native processing – turning consumer-grade devices such as theHoloLens and smartphones into powerful tools useful for oil and gas applications.

A high-level system architecture is shown in Figure 3 and Figure 4. The server is the core of thesystem, hosting the 3D environment and managing connections to all users, each with their own client XRdevice. Complex 3D content is hosted and rendered on the server, each of which is capable of handling24- simultaneous users depending on workload, graphics processing unit (GPU) model, and other factors. Ideally, each server is equipped with a powerful CPU(s) and GPU(s) to limit frame drops in highly complexenvironments, especially if dynamic lighting and shadows are used. As the server receives telemetry datafrom each connected XR device at a target frame rate, the render is updated on the server and encoded intocompressed video using dedicated hardware available on certain GPU models. This compressed video isthen transmitted across the wireless network to each connected client XR device. In this implementation,end-users on the XR client(s) and server (if applicable) interact with applications built on a game enginesuch as Unity™.

Figure 4 shows a unique controller technology that map hand movements into the virtual environmentand provide haptic feedback based on interactions, further transforming this technology from simulation tostimulation and improving retention for the participants.

Remote processing is already ubiquitous as exemplified by cloud computing. Real-time remote renderinghas become more prevalent recently, particularly in gaming, as the industry begins to shift from powerfulconsoles distributed across households to consumption on lightweight devices such as tablets via cloud-based streaming (Choudhry 2018). The principles of real-time remote rendering were applied in the contextof extended reality to develop the architecture described herein. Key performance requirements includedlow latency (less than 0.5s motion-to-photon delay), with high-definition resolution (720p or higher) running at a minimum of 30 frames per second – ultimately, to have the streaming application be indistinguishablefrom an application running natively on the AR or MR device.

Focusing on Major Accident Hazards – Process Safety Risk Management

Process safety risks associated with loss of primary containment is the most catastrophic risk facing theindustry (Miranda 2018; Sookdeo 2017). Operational readiness and crew capability are the determiningfactors in ensuring successful prevention and mitigation. Consequently, an innovative application of XR inoil and gas operations is optimizing operational readiness and crew response capability. Threat response drill(TRD) exercises can now be conducted with real-world, full-scale 3D virtual scenarios that escalate weaksignals into major catastrophic events for practical demonstration of operational readiness and crew resourcemanagement including response capability prior to conducting critical high-risk operations. Furthermore,crew response capability and human performance can be evaluated and optimized through progressivegamified AR/MR techniques (Ugoji 2017).

Applications in Process Safety Risk Management

The following key applications focused on product design and evaluation, point cloud visualization,reservoir model visualization, Threat Response Drills, and prototype surgical application will highlight theeffective of AR/MR technology to improve performance and safety in the oil and gas industry.

Each of these focus areas has been validated through internal deployments or customer pilot tests. Moredetail on these use cases and how the AR/MR platform enables each application is as follows:

Collaborative Training and Virtual Threat Response Drills

- One of the key applications of this technology is process-safety risk mitigation. Operationalreadiness and crew capability are the determining factors for ensuring successful risk prevention and mitigation. Consequently, an innovative application of AR/MR in oil and gas operations isoptimizing operational readiness and crew response capability. To enhance crew performanceduring the delivery of critical products and services, AR/MR can directly evaluate what individualsand crews have learned, remembered, and how they will perform at the jobsite. While in-housetraining and simulations are conducted, these 3D virtual scenarios are designed to be nonlinearwith

multiple outcomes based on user inputs, using customized user interface for launchingand interactive navigation. These TRDs provide safety assurance by collaboratively testing thelocalized crews' ability to respond to specific threat scenarios that can escalate into majorcatastrophic events.

- Threat response drill (TRD) exercises can now be conducted with real-world, full-scale 3D virtualscenarios that escalate weak signals into major catastrophic events for practical demonstrationof operational readiness and crew resource management. Human performance is evaluated andoptimized through progressive gamified AR/MR techniques.

  The 3D virtual scenarios are designed with multiple outcomes based on user inputs, and usingcustomized user interface for launching and interactive navigation. The TRDs provide safetyassurance by collaboratively testing the localized crews' ability to respond to specific threatscenarios including response capability to a loss of well control. Figure 7 shows screenshots ofthe 3D environment developed from actual jobsite equipment used for the coiled tubing TRDsimulation. Crews can perform AR/MR training and threat response drills in a group acrossdifferent devices in a classroom setting or between different physical locations. Participants areassigned an avatar in a shared physical space that tracks each user›s physical movements.
- The drills are designed to be nonlinear, but the general flow is as follows using the example of acoiled tubing operation:
  - Participants select a crew role, for example: coiled tubing supervisor, coiled tubing operator,and pumper. Each user has a digital representation known as an avatar that identifies their rolein relation to other participants in the simulation.
  - The interactive 3D environment becomes available to all participants and the TRD simulationbegins with an initial problem – weak signal. The scenario is contextualized by an introductionand overview of relevant information, including type of job being performed (e.g., cleanout),well depth and geometry, pressure control equipment specifications, and the type of fluid beingpumped.
  - The crew must properly and collectively respond to the problem to mitigate the risk.
  - If the users take the correct actions, they progress through the simulation and encounteradditional risk elements (escalation factors).
  - If the users take a certain number of adverse actions, the simulation (just like the real world)ends with a failure or «game over.»
  - Users receives a computed performance rating based on their actions and times.
- The TRD simulation is realistic, mimicking a built to-scale, real-world coiled tubing jobsite.The simulation features a high degree of interactivity; virtually every button and lever is usable.Interaction is performed using hand gestures with HoloLens or by screen touch for smartphonesand tablets. Underlying relationships between the interaction with 3D models, animations andsounds resulting from those interactions, action consequences, and scoring algorithms are allprogrammed into the game engine. The application of cloud-based software platform enhances thecomputational limitations of smartphones and AR/MR devices and enables real-time connectivityacross different hardware architectures. The system was particularly effective in identifying areasof improvement especially associated with human machine interface. AR/MR technology has demonstrated improvement in operations and HSSE performance especially driven by the abilityto shape human performance using progressive gamified techniques to increase knowledge andskill retention.

Pre-commissioning Activities – «As-Built vs. As-Designed»

- Engineering and operations can import complex 3D CAD models, dynamically scale, and overlaythem on top of as-built equipment to identify deviations, defects, and process risks beforecommissioning. Figure 8 shows the pre-commissioning of a compressor and pipeline equipmentwhere the user imports a complex model into the digital environment from 3D CAD software anddynamically scale and place it on top of as-built equipment to identify deviations and defects beforebeginning operation.

Facility and Site Orientation

- Similar to collaborative training but is typically more focused on guided exploration and involvesless user interaction. In the refinery picture shown in Figure 9, a full-scale refining site of over 60acres can be fully explored at human scale by the user to become familiar with the facility layoutand learn evacuation routes and muster points before stepping foot on the physical location.

Geological Evaluation

- Geological evaluations can be performed with surface and subsurface data. In figure 10, virtualfield visits can be performed on 3D digital outcrops reconstructed from photographs taken fromdrone flyovers, following an approach previously reported in the literature (Parra et al. 2018).Digital outcrops produced by this method can have extremely rich geometry, with model sizes wellinto the

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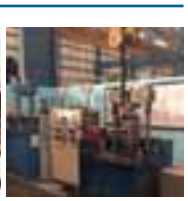

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tens of millions of polygons – far beyond the capability of AR and MR devices to render.Using this streaming platform, the outcrop can be visualized in full detail on any AR/MR deviceto perform a virtual field visit. Similarly, subsurface data such as 3D models of core specimens – similarly dense and rich datasets to the outcrops – can be visualized with this approach, providinga highly intuitive interface to evaluating data generated from a CT scan on the specimen.

Facility Design Reviews

- Offshore, an operator can conduct facility design reviews, to include piping and instrumentation,and create emergency response training protocols for an offshore facility or rig site, as shown inFigure 11.

Surgical Visualization System Prototype

- Outside of the energy industry, we are collaborating with the University of Oklahoma HealthSciences Center in Oklahoma City, to adapt the AR/MR software platform in surgical procedures.A prototype system developed to perform face tracking of patients in an operating room usingcomputer vision and facial-tracking algorithms to overlay patient data, such as 3D reconstructionsof CT scans, on top of the patient for dynamic viewing using AR/MR devices is underway. Thisdynamic visualization capability provide advanced surgical navigation leading to better patientoutcomes and lower costs. Some images of the prototype system are shown in Figure 12 below.

Conclusion

Enhanced AR/MR technology is now being leveraged in multiple ways, from digital visualization ofgeological reservoirs to enhance drilling and evaluation services to remote bi-directional communicationfor technical support as well as process safety risk management using collaborative threat response drillsas well as facility and design reviews. It will also gain prominence in the medical field as evident with theprototype application in surgical procedures. The AR/MR software platform greatly increases immersion,collaboration, and interactivity, enhancing the effectiveness of these technologies in well control and processsafety applications. The software platform enables remarkable levels of detail in 3D visualization onvirtually any AR, MR or VR device. The integration of advance controller technologies that map movementsinto the virtual environment and provide haptic feedback, further transform this technology from simulationto stimulation leading to better retention of knowledge, skill, and ability.

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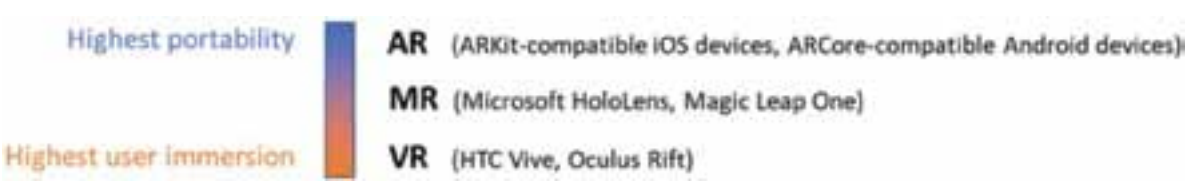

Figure 1—Spectrum of XR technologies and example products from each category.

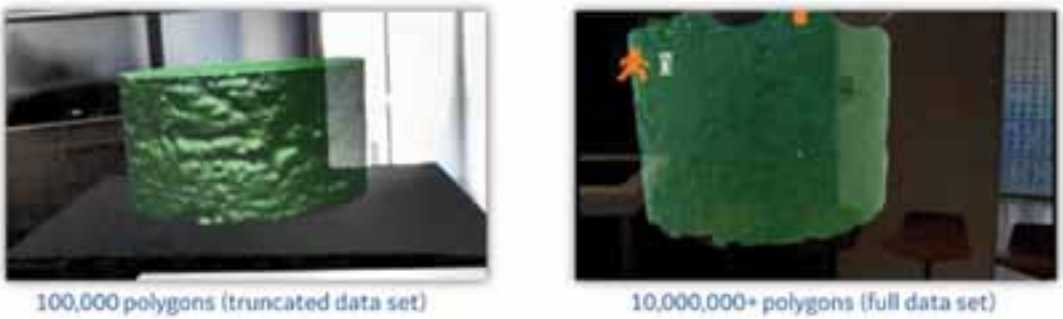

Figure 2—Difference in rendering capability of a core sample between native processingon the HoloLens (left) and the offloading and streaming approach with the HoloLens (right),viewing the same 3D model of the core sample (100,000 polygons vs 10,000,000+ polygons.

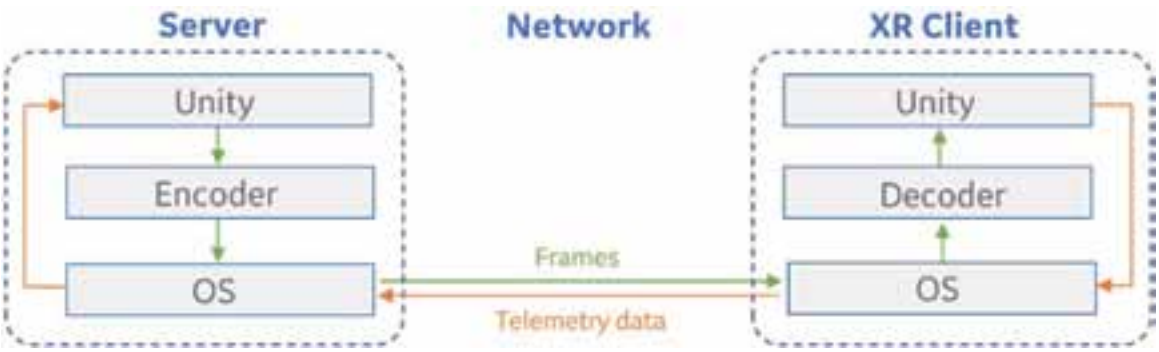

Figure 3—Streaming XR high-level architecture diagram.

Figure 4—Use of unique hand-mapping controller technology with hapticfeedback to increase Immersion of AR/MR technology with end-users.

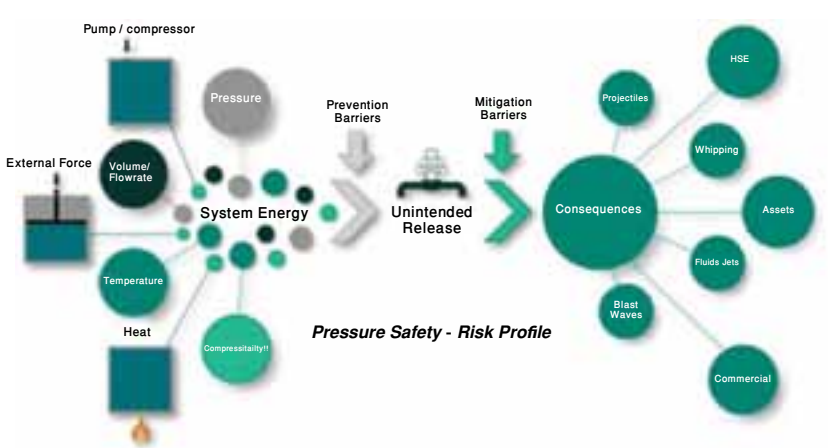

Figure 5—Process Safety risk associated with an unplanned release of energy – resulting in loss of primary containment.

Figure 6—Screenshots of key AR/MR application running on Microsoft HoloLensTM.

Figure 7—To-scale environment of coiled tubing worksite using actual equipmentbuild virtual assets resulting in more than 80 million polygons in a scene.

Figure 8—Evaluating As-Built vs As Designed commpressor.

Figure 9—Full-scale refinery site of over 60 acres.

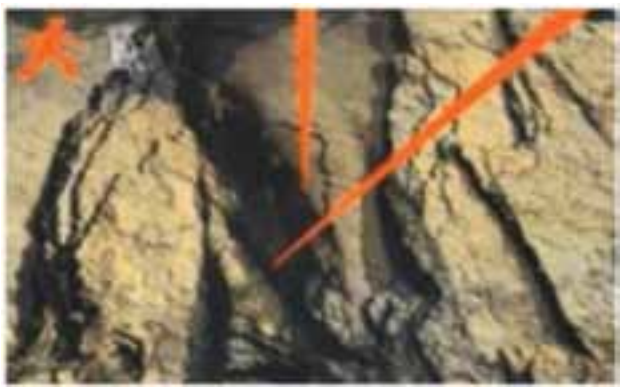

Figure 10—Full-scale refinery site of over 60 acres.

Figure 11—Scene screenshots from an interactive offshore rig platform training application, delivered to users viaHoloLens, smartphone and/or tablet that provides site orientation, identifies major hazards, and shows evacuation routes.

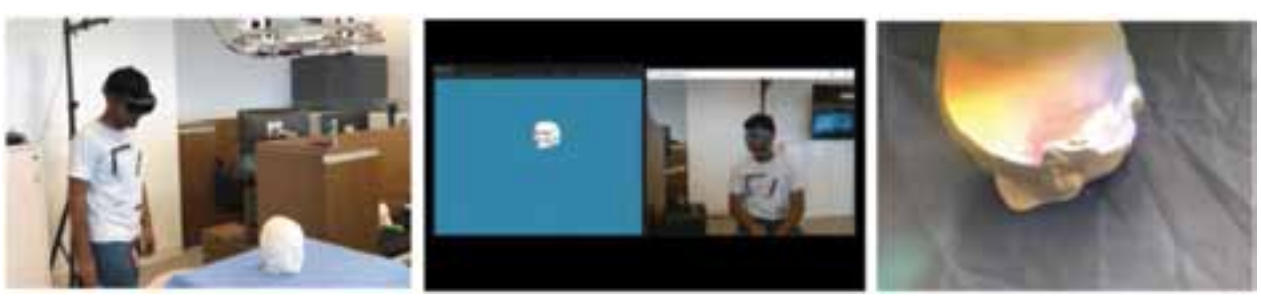

Figure 12—Pictures of the mixed reality surgical visualization system prototype. The cameras are used to trackpatient movement in real-time, while the HoloLens is used by physician(s) to visualize 3D data on top of the patient.

The Role of FEED Front End Engineering Design In The EPC Execution Strategy

By: Armando Bianco, EniProgetti

Abstract

The evolution of Project Management in Engineering, Procurement & Construction (EPC) Projects is thereflection of the global industry demand, continuous technological innovations and the changing needs ofthe customers and stakeholders.

These factors have deeply impacted Project Engineering.

Engineering is responsible for converting the business idea into tangible objects: documents, drawings,management plans, etc. which will eventually allow the realization of the Project itself. From the firstconceptual proposal to the final as-built drawings, engineering flows through different phases whichcommonly refer to the following sequence:

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Introduction

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Pre-Feasibility-> Feasibility-> Basic-> Front End Engineering Design (FEED)-> Detail Design-> FieldEngineering-> As-built phase.

The objective of this paper is to analyze innovative methodologies to enhance the role of the FEED asthe driver of the business needs which have deeply changed in the last decades in all industries, not least,in the energy industry.

Before presenting these methodologies, it is useful to recall which were the most important drivers ofthis evolution.

Project Engineering Management, and more widely Project Management, has been perceived in the pastas the art of planning and controlling (schedules, budgets, resources, etc.) with a fixed scope of work (SOW);it relied on the principle that the detail planning developed at the beginning of the project followed bymonitoring the variances could lead to achieving the project objectives.

With the evolution of the business needs, the idea of fix scope has progressively lost its consistency sothe development of AGILE approaches has proposed a way to fill up the rooms left empty by traditionalapproaches in terms of incremental development of project objectives and continuous alignment with theexpectations of the clients.

At the same time, new customers and more aggressive EPC contractors have entered the market.

As a result, the project execution experience has become like an oscillating pendulum betweenconsolidated approaches versus new adaptive techniques, recursive outsourcing versus internalrationalization and relocation of company governance responsibilities by sharing them between functionalunits (including procurement) and the project team.

Within the execution strategy, among all objectives which could drive EPC projects, the time to marketis widely the most challenging one. In these projects, the sponsor may be willing to increase the budget withmore allowances and contingencies to reduce the standard schedule. This approach results in an increasingpressure on the project team for the entire project life due to higher expectations. Reality shows that theincreased resources not always assure the achievement of the targets of the schedule unless specific strategiesare put in place.

The scope of this document is to present three methodologies that can be applied during the FEED phase tosupport the project strategy in a resilient way and to meet the time to market objectives. These methodologiescan be complementary to the traditional and AGILE approaches and are the following:

- Counteracting the risk associated with the fast-track methodology;
- Reverse Planning to verify the critical path;
- Construction feasibility.

The above were applied in development projects during the FEED phase related to Oil and Gas projectsand have been filtered out in this paper to present a uniform methodology that can be applied to differentindustries.

Topic 1: Counteracting the risk associated with the fast-track methodology

«I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing aman on the moon and returning him safely to the earth» by John F. Kennedy. These were the words used bythe USA President to announce the commitment to the project of landing the first man on the moon. It self-contains the project scope of work – SOW (landing a man on the moon); the schedule (before this decadeis out) and the quality requirement (returning him safely to the earth).

Recalling the well-known triangle of project management SOW (Cost, Schedule and Quality), in theabove mentioned project, the cost constraint was not included by the President, it was simply regarded asmuch less important than the other constraints, in consideration of the fact that the project was actuallyinvolving the progress of mankind.

Thus, for some projects, certain constraints prevail on the others.

In particular, fast-track projects are those where the schedule assumes a dominant role.

According to the Project Management Institute PMI, there are two ways to achieve a reduction of astandard schedule: crashing and fast-tracking.

Crashing means reducing the standard length of the phases which constitute a project, generally byintroducing additional resources, without changing the sequence of the steps or waterfall scheme. Crashingwill not be further analyzed in this document.

Fast-tracking means, instead, overlapping the phases or part of them without reducing the length of eachphase.

The fast-tracking methodology allows starting subsequent phases without consolidating the previousones. The most common impacts are: relying upon preliminary information, overdesign material, designingbased on assumptions, increasing interface management, more complex decision making, etc. These aspectslead to the following risks: higher cost, increased possibility of inconsistencies, more engineering man-hours, more reworks, more difficult engagement of personnel, etc. The art of overcoming the associatedrisks of fast-tracking is the key point of fast-tracking management.

There could be different ways to mitigate the risks, the approaches described in this paper are: «RecyclingEngineering» and «Final Alignment.»

They have been applied in Fast-Track projects when Basic was overlapped with FEED and FEED withDetail Design.

To characterize them by means of practical examples, we can consider some specific areas: DesignDevelopment; Procurement cycle and Team Management.

Recycling Engineering.

Recycling Engineering - Design Development

Recycling Engineering is the process of handling, in parallel, the same input data for different phases of theproject. The preliminary information, that is evaluated from Basic Design to Detail Design, always needsto be re-checked and updated every time further information is available.

At the beginning of the project, the documents which are considerated critical and more difficult to beupdated need to be planned to be issued more often even on weekly basis, in addition to standard milestonesof revision.

Piping and Instrument Diagrams (P&IDs) are an example of these documents.

These drawings are vital for every project because they provide the fundamental of how a plant works,which material will be adopted, which are all the interfaces, etc.

Traditionally, each engineering contractor has a defined process with design review sessions and precisemilestones: issue for comment, for design, for hazop, for construction, as-built, etc. Normally, five-sixrevisions are common for a three-four years' project.

In a fast-track project, the official revision time-frame impacts the schedule.

It is mandatory for the process discipline, which is the generator of the P&ID, to share the informationwith the piping and instrumentation disciplines. These disciplines will import the process information tofulfill their own engineering documents (for instance material take-off or datasheets) and will update theP&ID based on their needs.

Appling this approach on weekly basis, with constant updating of all the impacted documents, is the aimof Recycling Engineering.

It is very useful to track the changes with specific instruments, like log of changes, to be distributed toall the project team.

The right balance of number of revisions (weekly, bi-weekly, etc.) needs to be agreed and committedwith all team members since from the beginning of the project because it definitely has an impact on theconsolidated way of working

of the team.

Recycling Engineering - Procurement cycle

Generally, in large companies, due to consolidated regulations, the procurement cycle is managed «outside»the project to assure the application of procurement principles and processes. The procurement cycle consistsof main steps (invitation to bid, bid acceptance, technical clarifications, commercial clarifications, vendor selection) which have a time frame not always compatible with the project schedule. Thus it may happen inearly buying stages to make an optimistic hypothesis to reduce the standard time of procurement, hypothesisnot always confirmed during the execution phase.

Recycling Engineering applied during the development of the supplies is trickier. Special agreementswith the vendor have to be consolidated to verify in detail the development of the vendor's design and itsown procurement cycle. The aim is to implement a schedule based not only on contractual steps but also onthe real vendor internal process. The proper interface plan for exchanging input and output data will allowconsolidating the engineering on time. This approach shall be completed foreseeing steps of a material re-check/re-rate to avoid reworks during construction and commissioning.

Recycling Engineering - Team Management

It is mandatory that the project manager should strive to align all the project team members to the projectobjectives. This is a general rule for every type of project, in fast-track ones it is even more important. Evenif the critical milestones could be unmovable, most probably the daily strategies can change to catch newopportunities. In other words, the project team is impacted by many changes and reworks due to RecyclingEngineering which could lead to demotivation and frustration. Full commitment and alignment are requiredfrom an early stage of the project by linking the individual objectives to the project ones;

Clear definition of the project structure with clear rules for interface management become a criticalfactor. In fact, due to the overlap of phases, different designers will work on the same item with differentresponsibilities and perspectives. For example, it may happen that for the same pipeline the processdepartment of the basic design team is struggling to fix its process proprieties to close the simulation whilethe process department of the FEED team has already issued the datasheets of all items included in thesystems (valves, machineries, etc.).

Fig. 1 shows, by means of a simple example, how the number of interfaces increases during fast-tracking. Without fast-tracking, at the end of each engineering phase, the engineering package is sentfrom the contractor to the client who sends it to the next contractor for the next phase. In this case onlydirect (contractual) interfaces are present. When applying fast-tracking, it is needed to open communicationchannels between the different contractors and vendors and the number of indirect interface increases.

Final Alignment.

Final Alignment - Design Development

In consideration of the risk that the cycles of Recycling Engineering could end-up in some documentationbeing not updated, at the end of each phase, an external team of designers is requested to perform a consistency check on all the documentation available and to update and re-issue the affected documentationbefore officially closing the previous phase.

Final Alignment - Procurement

Final Alignment applied in the procurement cycle, initialized with preliminary information, impliesupdating all the data at the end of the technical clarification, before issuing the purchase orders (POs). Thisapproach allows saving time and also avoids impacts in terms of budget.

Final Alignment - Team Management

Final Alignment of all different phases in terms of team management means that end-users may be requestedto make the consistency check in earlier phases when they are usually not involved. For oil and gas projects,it means that the Operation representatives are part of the project team since from the beginning.

Topic 2: Reverse Planning to verify the critical path

«So let us then try to climb the mountain, not by stepping on what is below us, but to pull us up at whatis above us» by M.C. Escher. The art of. Escher represents, through deep effect games of prospective, howthe starting point may overlap with the final one. Reverse Planning is a method to analyze the process ofplanning from a different prospective to highlight the eventual inconsistencies of the project schedule.

One of the main topics of project management is the art of planning. Project management literature hasintensively been focusing on it and many resources and tools have accordingly been developed. The mostimportant result has been the introduction of two concepts: «float» and «critical path». The float is «theamount of time that a schedule activity can be delayed or extended from its early start date without delayingthe project finish date» [1]. The critical path is the sequence of activities having zero float.

At the beginning of a project, a certain number of long lead items (LLIs), which have long delivery times,are identified by applying the critical path method (items being on the

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critical path). The traditional LLIsare high-pressure and high-temperature equipments and items made from special materials, etc.

During the execution of a project, however, it is common to face issues which were not foreseen at thebeginning, «project management is the science of project planning with the art of reacting to surprises duringexecution» [2].

For example, it may happen that even very basic materials, that by definition do not have the longestdelivery, could become critical in specific phases of the project and especially in the latest phases.

This happens not necessarily because of a loose planning, but rather because of the intrinsic difficulty toanalyze detail activities which occur in later phases of a project.

One possible solution to mitigate the above risk is to apply «Reverse Planning» during the FEED.

In order to better understand how this process works, it is useful to recall how traditional planning ismanaged. In practical and basic terms, the project schedule can be depicted as an arrow with a defineddirection; the plan starts from the first activities and step-by-step the following ones are added. Traditionally,it starts from the «left» and points to the «right».

Starting from the left, each activity that is part of the project is estimated based on internal know-howand market investigation. Each activity may have links to the previous and the following activities.

Once all activities are duly inserted in the schedule, with the proper links, the schedule can be furtherrevised with resource smoothing by shifting «not critical» activities to optimize resource peaks.

A further step is to consider, for each activity, the deviation from its deterministic time length byintroducing tolerances to produce a risk-based schedule.

This process strengthens the confidence of developing a correct project planning.

At the end, the result may be represented as per fig.2.

During the execution of the project, the level of the schedule may further be developed by adding moredetails and inserting additional activities or sub-activities to the project original baseline. This approach isbased on increasing the level of precision while retaining the milestones.

Instead, «Reverse Planning» has a different approach: it starts defining the final priorities of a project andverifying which are the impacts in all phases of the project «from right to left».

The definition of priorities depends on how the plant will be put in operation.

For example, for a very basic SOW composed only of one machine, the last step is the running of themachine itself. To obtain this final goal, the previous step is that electricity needs to be available at a specifictime.

It means, moving back to the left in the schedule, that the electrical cables have been installed andconnected on specific milestone days. The cables themselves need to be available at the construction siteto allow their installation. Previously they have been fabricated at the vendor facilities and moving evenfurther on the left a purchase order has been issued on a specific time frame and so on.

The schedule is checked from right to left to the very first step of design at the beginning of the project.

In other words, analyzing the priorities, a certain number of elements which produce a specific functionneed to be put in place at a specific time.

Commonly, the elements of a priority are grouped by «system» and the activity to verify that all systemsare functioning is referred to as Commissioning, which is also the last phase of a project. The aim is toverify from right to left that all the elements of the system have been planned at the proper time from theend (final effect) to the start (initial cause) verifying all possible constrains. The constrains depend on theway each phase of a project is managed.

In fact, engineering is managed by disciplines, construction by areas and, as anticipated, commissioningby systems.

During engineering, as described in topic 1, the design development is approached by splitting theactivities in technical disciplines: process, safety, civil, mechanical, electrical-instrumental, etc. Duringthe construction, the importance of splitting the plant into different areas that may be approached fromdifferent fronts is the objective of a good Construction Manager. The subsequent order of construction isthe physical sequence of its parts: it is unfeasible to install a pipe-rack without having first in placed therelative foundations.

During commissioning, the plant is split into different systems each constituting the minimum set ofitems that need to be interconnected in order to produce the proposed function.

The systems, by definition, are transversal either to construction and engineering.

Construction-wise it means that all the construction activities of the system to be commissioned arecompleted, regardless of the overall construction completion of the areas involved. Engineering-wise, thedesign shall be finalized, updating all the possible modifications happened during construction and includingall the documentation for operation and maintenance, for all the disciplines involved.

Graphically, mapping the different elements of a system in

the different phases, a picture like fig.3 maybe obtained.

It is immediate to recognize that these elements appear since from the very beginning of the project andif not properly managed, they eventually become critical.

Applying the critical path method to each system, it may happen to discover that these elements are newlong lead items (LLIs) because they are on the specific critical path of the system. They were not capturedwith the traditional approach because they do not have long delivery times and in fact they can be bulkmaterial, concrete, steel structures, tie-ins, etc.

Coming to a real example, in a large revamping project, the SOW included the installation of a unit onthe area where an old plant needed to be demolished.

In the first schedule, developed by the basic engineering contractor, the demolition activities were plannedlogically before the start of the construction ones and demolition drawings were planned as deliverablesduring the engineering phase.

No major issues were raised by the basic contractor nor could they have been disclosed from the scheduleitself.

Appling Reverse Planning during the FEED and performing the analysis of the systems, it was possibleto recognize that the tie-ins (needed to allow the isolation of the unit to be demolished from the other plantsto be retained) were not properly planned.

The tie-ins should have been planned systems-wise according to maintenance shut-downs of the otherplants. The tie-ins material, in the meantime, became critical; they were purchased at higher cost because ofa requested shorter delivery time. However, it allowed a huge saving for the client in terms of production.

Topic 3: Construction feasibility

«If you're not worried, you need to worry. And if you're worried, you don't need to worry». This sentencefrom Ray Dalio founder of one of the most successful hedge fund aims to emphasize how optimism couldlead to incorrect analysis or to underestimate issues which could hide potential impacts. This sentenceintroduces an important technical aspect, which is often underestimated even by experts, which is theFeasibility.

Feasibility can be considered as the intersection between the availability of drawings and material. Afoundation will be considered feasible if the concrete, bar bending, anchor bolts, etc. are physically availableat site and the relevant foundation drawings and foundation plan are issued for construction (IFC).

Feasibility does not imply aspects of construction sequence. For example, if the area is affected bydewatering which impacts the starting of the construction work, the foundation is feasible, but yet notconstructible or erectable.

The feasibility is critical for different reasons.

The first reason is the time span between engineering development and construction or installation. Generally, the last engineering drawing is the first needed for construction. In fact, construction starts withfoundations as first activity and the foundation drawing is one of the last documents of engineering. In fact,the foundation drawings are developed after a long process involving for every equipment the main steps:process design of the equipment, mechanical checks, bid phase, vendor selection, vendor engineering, final the vendor information, foundation drawing.

The second reason is the timing for feasibility plans to be issued. Generally, they are developed by theEPC contractors during late detail design or before starting the construction activities. In some cases, theresponsibility for preparing the feasibility plans are assigned to the relevant subcontractors who have theownership of the works. In this phase, important constrains are already in place: most of the budget for theprocurement has been spent and high value contracts for construction contractors have been already placed.

The approach to execute tasks in the proximity of the event is a very common practice and it is alsonamed «student anxiety». From one perspective it is a very efficient way to manage tasks because it allowsbeing very focused on proximity of a deadline. From another perspective, however, it could force to reducetime of reaction in case unforeseeable events happen, and they generally do!

The third and last critical aspect of feasibility is that different stakeholders are used to «measure» it withdifferent measurement ways.

The feasibility of piping fabrication provides a focused example.

Engineering-wise, fabrication is measured in terms of isometric drawings. They are the representation ofthe pipeline in 3D view and they include all the material foreseen for the fabrication and erection.

Material procurement-wise, fabrication is measured in weight: prices are generally by Kg and this aspectis very important also for logistic and warehouse management.

From a pure construction perspective, the fabrication is measured in dia-inches, because it is traditionallyrelated to the yield of the welders.

Three units to measure the same thing will necessary lead to miss-alignments.

A possible way to overcome and manage the timing and misalignments issues can be by planning andexecuting the feasibility plan during the FEED.

This is a specific moment of engineering, when the development of the design is «enough» mature to relyon the data available and it is easy to implement recovery plans on materials or design.

Specifically, for the mechanical discipline, the piping department has already produced the MTOs ata sufficient level to evaluate the overall and the details. 3D model activities have already started and arecompleted to a level which can allow to develop a realistic planning for isometric drawings.

With this information, the project team is able to produce the feasibility curves far in advance of theconstruction phase, see fig.4.

Conclusions

This paper depicteds possible ways to meet the objectives of EPC projects through non-traditionalapproaches which can be developed during engineering and in particular in the FEED phase: counteractingthe risk associated to fast-tracking, performing the Reverse Planning to verify critical paths ofcommissioning systems and preparing construction feasibility.

By enhancing the confidence to support business needs and the EPC processes, Project EngineeringManagement will keep its central role in Project Execution.

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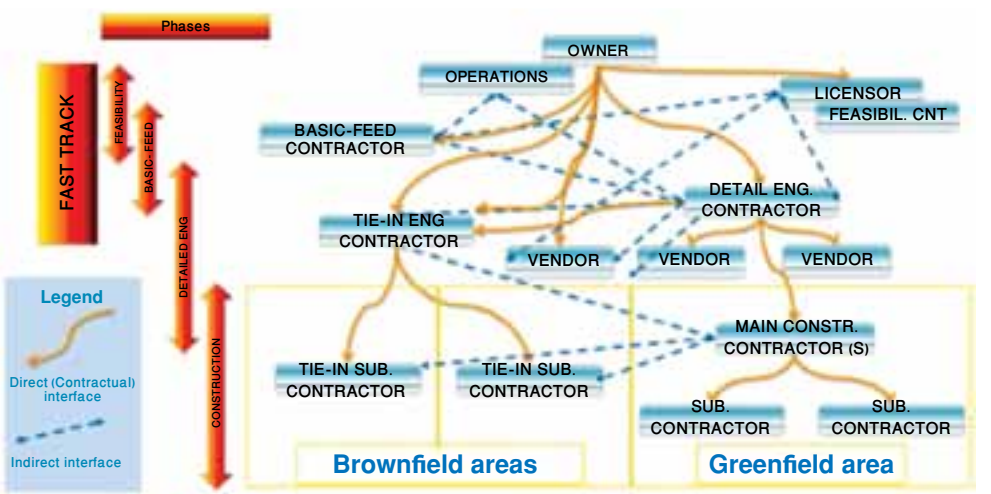

Figure 1

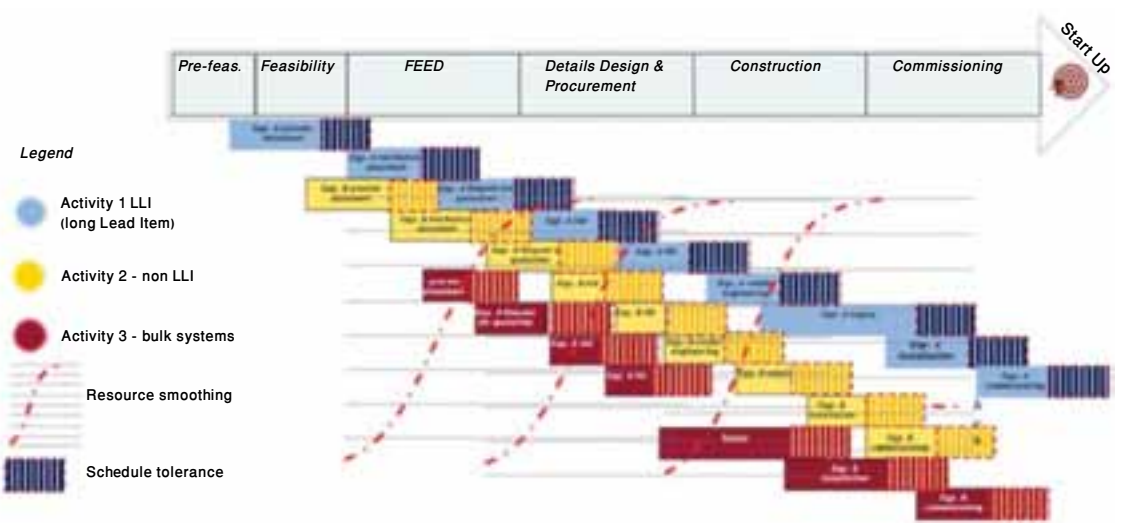

Figure 2

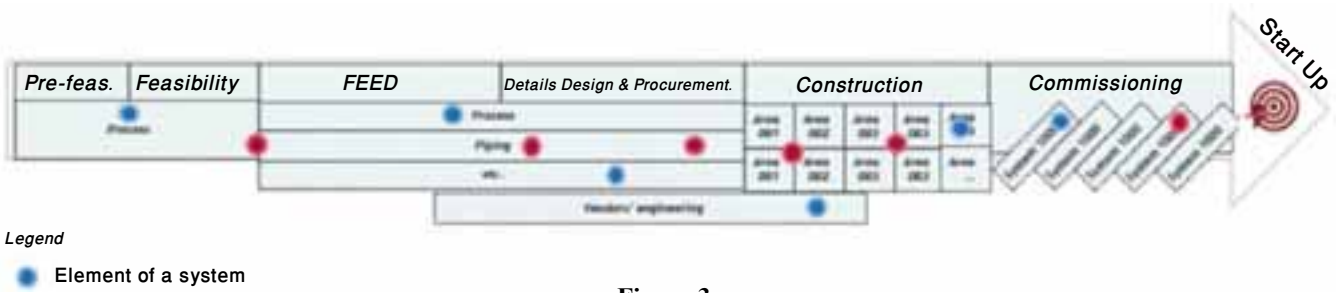

Figure 3

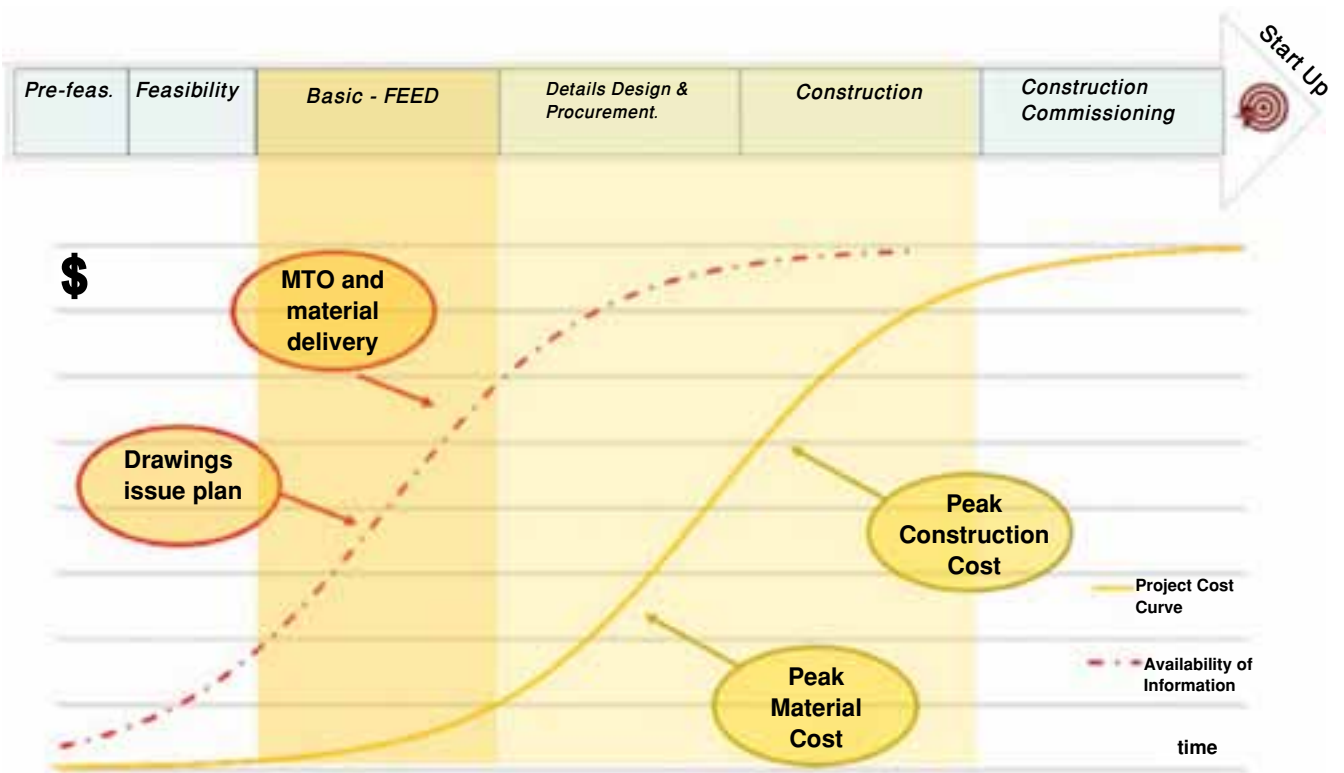

Figure 4

Drones Make a Step Change on How the Oil Industry Manage Safety and Environmental Risks

By: Hisham Saadawi, Baker Hughes

Abstract

Continuing development in the technologies of unmanned aerial systems or drones offer opportunities tothe oil industry to make a step change to the way we manage safety and environmental risks. The useof drones can minimize exposure of personnel to dangerous environments, monitor the environment andenhance asset integrity.

The SPE vision is to advance the oil & gas community›s ability to meet the world›s energy demand ina safe, environmentally responsible and sustainable manner. HSE or Health, Safety, the Environment andSustainability are core values in the oil & gas industry.

This paper reviews how the current and potential applications of drones in the oil industry can enhancesafety and environmental aspects of oil and gas operations.

Introduction

Drones have been used by the military for decades, but recent years saw remarkable growth in their use invarious other industries including the oil & gas industry.

Unmanned aerial systems (UASs), popularly known as «drones» are changing the way oil and gascompanies do business. In this paper, the focus is on the application of drones to enhance HSE performance.

There are more than one type of drone used in industry. Depending on the aerial platform, they can begrouped into four major types (Uyanik 2019).

Multirotor drones (Fig.1)

Are the most popular type of drone because of their low cost and ease of use. They can have three, four, sixor eight rotors (Figure 1). Multi rotor drones have limited flying time (20 to 30 minutes) and can typicallyonly carry small payloads.

Fixed wing drones (Fig. 2)

Fixed wing drones have longer flying times and typically carry heavier payloads than multirotor drones.They require space for take-off and landing. They are commonly used for surveillance of pipelines ormapping.

Single rotor helicopter drones (Fig. 3)

Single rotor drones are similar to helicopters and are more efficient than the multirotor type. They typicallyhave longer flying times.

Fixed-wing hybrid drones (Fig. 4)

Hybrid drones are being developed to combine the advantages of fixed wing models (higher flying time)with that of multirotor drones by having longer flying times and vertical takeoff and landing capabilities.

Recently, the American Petroleum Institute published guidelines on developing UAS programs (API2019). The publication aims at helping oil and gas companies identify what questions they should be askingas they develop UAS programs.

As shown in Fig. 5, the field life cycle can be broadly divided into four phases (Saadawi 2019):

- Exploration & Appraisal
- Development
- Production
- Decommissioning.

The industry is experiencing more emerging applications of the technology of UASs in the lifecyclemanagement of oil companies' assets. Some of these applications are discussed under each of the phaseof the development.

Drones in Exploration & Appraisal

Exploration for oil and gas involves geophysical and survey operations. Land seismic surveys involve alarge number of personnel relying on 'boots on the ground' approaches. Seismic survey crews often haveto work in remote parts of the world, hostile environments and difficult to access geographical areas suchas tropical jungles, mountainous terrain or deserts.

The International Association of Oil and Gas Producers published a report on UASs in the geophysicalsector (IOGP

2017). It pointed out that within geophysical applications of UASs, land seismic operationsare perhaps where there are almost limitless opportunities.

Seismic surveys

In 2014, Total launched an integrated research project named METIS (Lys 2018). The project aims atusing automated fleets of drones in order to deploy innovative seismic sensors equipped with cutting-edgecommunication capabilities.

The philosophy behind this concept is that by limiting the number of personnel involved on the ground,METIS keeps cost and HSE exposure to a minimum, and opens the possibility to explore acreage in someof the most difficult areas to access in the world.

Mapping outcrops:

Outcrops can provide important geological information which is used for building a geological model whichprovides input to the reservoir simulation model. UASs can be used to collect digital data for building ageological model using information from outcrops.

For example, Saudi Aramco recently used a drone for this purpose (Mezghani et al 2018). A geographicinformation system (GIS) is used in planning the flight route of the unmanned aerial system. Suitablesensors and drones were selected for data acquisition. This was then followed by selection of the modeltype, for instance, digital elevation, texture, and/or mineral composition as well as the required resolution;information is needed to select suitable sensors and drones for the data acquisition. After acquiring the datausing drones equipped with the appropriate sensors, the acquired data is converted to geological modelsthat geologists can use to study the outcrop.

Detection of explosive remnants of war (ERW)

Many oilfields as well as seismic acquisition areas are in previous war zones and areas of conflict. ERWsare serious hazards to personnel. In this context, ERWs include land mines, unexploded ordnance andabandoned ordnance. When conducting HAZID studies in Iraq, it is common practice to record ERW asa potential hazard.

Drones can be used to identify potential and specific threats within the study area. They can also provideindividual ERW geo-referencing, so that exact locations can be determined and subsequently avoided duringoperations (IOGP 2017).

Using drones to locate unmarked abandoned wells:

The first oil well was drilled in the US state of Pennsylvania in 1859. No wonder, the state has morethan 300,000 recorded wells (Hmmack 2018). When drilling a new unconventional well that will behydraulically fractured, the state requires that operators identify existing wells within a 1000-ft-wide bufferzone surrounding unconventional wells.

Hammack (2018) reported that drones have been used successfully to locate abandoned wells. The resultsfrom drone magnetic surveys were found to equal results from magnetic surveys flown with a mannedhelicopter.

Drones During the Development Phase

Once the decision has been made to develop the field, drilling of wells, engineering procurement andconstruction activities of the flow lines, pipeline and production facilities must begin. Drones can helpengineers in planning and making the best decision at all stages of the development. The conventionalmethod for site surveying is to send a survey crew to examine the site. For pipeline routes, the survey crewhas to travel the proposed route and produce alignment sheets. In remote locations and difficult terrainthese activates can expose personnel to health and safety hazards. Examples of how drones can be used tominimize exposure to such hazards include the following:

- Site reconnaissance and topographical survey and identifications of obstacles
- Identify rig and transport access routes
- Survey potential pipelines routes and right of ways
- Survey of overhead power line routes
- Obtain real-time data on construction activities progress
- Monitoring security at site

Bayramov et al (2019) describe how UASs were successfully used to survey and image 87 square kmin Azerbaijan-Georgia-Turkey Region.

Drones Support to Production Operations

The first use of drones in the oil industry was in the support of production operations activities suchas asset integrity. Today, there are more applications found in support of the operations phase thanany other phase of the asset lifecycle.

Surveillance and visual inspection of field operations

In its Permian Basin operations, Shell uses drones to conduct surveillance and visual inspection of its assets. This drastically reduces road safety hazards as a result of reducing the time operators spend driving on theroad and significantly reduces road safety risks.

Using drones for remote visual inspections reduces the amount of time operators spend driving on theroad and so significantly reduces road safety risk. FAA approval was obtained to allow the drones to flyBVLOS with the assistance of radar. Shell reported that the first drone pilot covered 3,500 acres in a dayand executed more than 65% of the site operators' tasks (Shell 2018). Shell points out that drones can helpto identify issues and leaks faster and enable exception-based surveillance – allowing our site operators

tofocus on the most critical issues of the day.

Inspection of Storage Tanks

Crude oil storage tanks are taken out of service, cleaned and internally inspected to detect any anomaliesand weak spots in the tank wall and tank bottom. The frequency of this inspection is determined by theguidelines given in API Specs 653.

The traditional method to inspect the tank internals after taking it out of service is to erect scaffoldingand have personnel doing the inspection manually. Drones can now conduct inspections in compliance withAPI 653 at much shorter time and reduced exposure of personnel to the hazards of working at heights and inconfined space. In one case study, it is estimated that the time needed for tank inspection using the traditionalmethod could be up to 2 weeks compared to two days if drones were used for inspection (Al Amir 2018).

Inspection of above water risers:

BP is developing and implementing new robotic inspection technologies using drones and crawlers forabove water riser inspection (Lou 2019). Traditionally, the visual inspection of the above water riser andpiping is performed by certified rope access inspectors. BP tested the concept in an offshore platform inthe Gulf of Mexico. The reduction of safety risk and improvement of efficiency are two major driversfor replacing manual inspections with robotic inspections. Lou et al (2019) gave a comparison betweentraditional methods for inspection and robotic inspection. The crew size was reduced from four to two whenthe inspection was done using drones. The need for a safety boat was eliminated and the number of daysrequired to do the task was reduced from 12 to 4.

Inspection of Overhead Electrical Power Lines

Annual inspection of high voltage overhead power lines is conducted to verify their integrity and complywith required annual inspection as per the electric code (Hoffmann 2018). The traditional way for inspectionis for the lineman to climb the pole with a body belt, safety strap, and a pair of climbers. Drones offer asafer alternate to do this task. Hoffman (2018) reported that a drone took 45 minutes to complete the task. On the other hand, a lineman would have needed a full day working at height to complete the same task

Monitoring methane emission

A recent development to detect methane emission is a new platform, which combines drone technologywith ground-based solar powered-sensors as shown in Figure 6 (Jacobs 2019).

The real-time emission data is transmitted from the field to a cloud-based software where it is accessedvia a computer or smartphone (Jacobs 2019). Onboard the drone is a high-definition camera, a 3D scanner,optical gas imager, and a tunable diode laser.

Improving emergency oil spill response

Hall (2018) examines various tasks that can be carried by UASs in an oil emergency response situation. Forexample, multi-rotor type drones can assess the level of oiling along a shore to prioritize segments for clean-up and direct the initial deployment of response resources. For offshore spills, fixed wing UAS can improveencounter rates (dispersant and recovery equipment) by targeting the dense patches of oil and provide abird›s eye view of the operations.

Drones and Decommissioning

Removing offshore facilities poses major challenges. Decommissioning activities include cutting and liftingtop sides other structures and transporting them to shore. Accurate knowledge of center of gravity, slingloading and appropriate lifting points is essential for the safe lifting of top sides. In many cases, old offshoreplatforms have changed ownership and modifications have been made to the topside such as installingadditional water treatment module or replacing equipment. The as-built drawings and documentation areoften not updated or even nonexistent (Saadawi 2019). High-resolution cameras mounted on drones can produce digital data generated geometric models for the topside and identify key parameters for liftingactivities.

For example, ahead of the decommissioning campaign of a gas field offshore Ireland, UASs were usedto conduct condition assessments of two offshore platforms (Cyberhawk). The drones were used to inspectthe difficult areas to access such as access the platforms underdecks, risers and conductors and splash zone.

As well as the integrity assessments, the captured data which allowed a 3D point cloud model of theplatform to be generated for use by the Operator to plan de-commissioning activities.

Key Enablers and Challenges

Like any emerging technology, many factors have contributed to the spread of UAS technology. UAStechnology also has its own challenges to overcome.

Enablers

- Remarkable drop in drone prices over the last few years.
- Advances in remote sensing technology; e.g. LIDAR infra-red camera & acoustic technology.
- Development in aeronautics & battery technology.
- Application of machine learning and data analytics to leverage the large data gathered by dronesto produce the relevant information.

- Collaboration between the oil industry and other industries (leveraging know-how and experiencefrom other industries).

Challenges

- The need to increase payload capacity and further increase in battery life.
- Integration between different technology platforms.
- Consistency in standards and regulations between countries. Indeed, many countries are nowdebating and developing regulatory issues related to the use of drones as they would with anyinnovation that has implications for public safety (Mckinsey).
- Drone and data science technology is progressing at a rapid pace. This presents a challenge to oilcompanies considering a UAS program.
- Training operators to operate drones safely.
- Cyber and physical security.
- Misuse, ethics, privacy claims and liability.

Conclusions

HSE or Health, Safety and the Environment are core values in the oil & gas industry. As shown in this paper,UASs can make significant contributions to each of these core values.

- Health
  - Conduct hazardous material (e.g., asbestos) survey in old buildings to support decommissioningactivities.
  - Monitor emissions and products of incomplete combustion.
- Occupational safety

Occupational safety generally refers to classic health and safety, normally associated with theprevention of trips, slips and falls. It is concerned with the safety and well-being of the individual.

  - Eliminate or minimize the time personnel spend working at height, within confined space andabove water.
  - Improve road safety by the time operators spend driving at site.
  - Minimize exposure of personnel to the elements while working in hostile and extremeenvironmental conditions.
- Process safety

The focus in process safety is on the prevention of unplanned release of hydrocarbons whichcould escalate into a measure accident. Drones are used for:

  - Detecting and identifying hydrocarbon leaks in real-time to allow corrective action beforeescalations, which may result in a major accident.
  - Conducting asset integrity tasks such as measuring wall thickness of vessels, tanks and structure.
- Sustainability and protecting the environment

The vision of the Society of Petroleum Engineers (SPE) is to advance the oil & gas community'sability to meet the world's energy demand in a safe, environmentally responsible and sustainablemanner. Examples of how drones can safeguard the environment include:

  - Minimizing impact and footprint of oil industry exploration activities on the environment.
  - Real-time monitoring of hydrocarbon emission and fugitive emission.
  - Detecting and surveillance for crude oil spill control and assisting response efforts.

Acknowledgements

The authorwould like to acknowledge Baker Hughes for permission to publish this paper.

Abbreviations

API	American Petroleum Institute
BVLOS	Beyond visual line of sight
FAA	Federal Aviation Authorities
HAZID	Hazards Identification
IOGP	International Association of Oil & Gas Producers
LIDAR	Laser Imaging, Detection And Ranging
EWR	Explosive Remnants of War
UAS	Unmanned Aerial System (or Unmanned Aircraft System)

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Figure 1—Multirotor droneImage source: https://www.geospatialworld.net

Figure 3—Single rotor helicopter drone (image source: https://www.droneomega.com)

Figure 2—Fixed wing drone(image source: https://www.unmannedsystemstechnology.com)

Figure 4—Hybrid VTOL Drone(image source: HQ-90C Hybrid Quadrotor https://www.unmannedsystemssource.com)

Figure 5—Life cycle of an oilfield

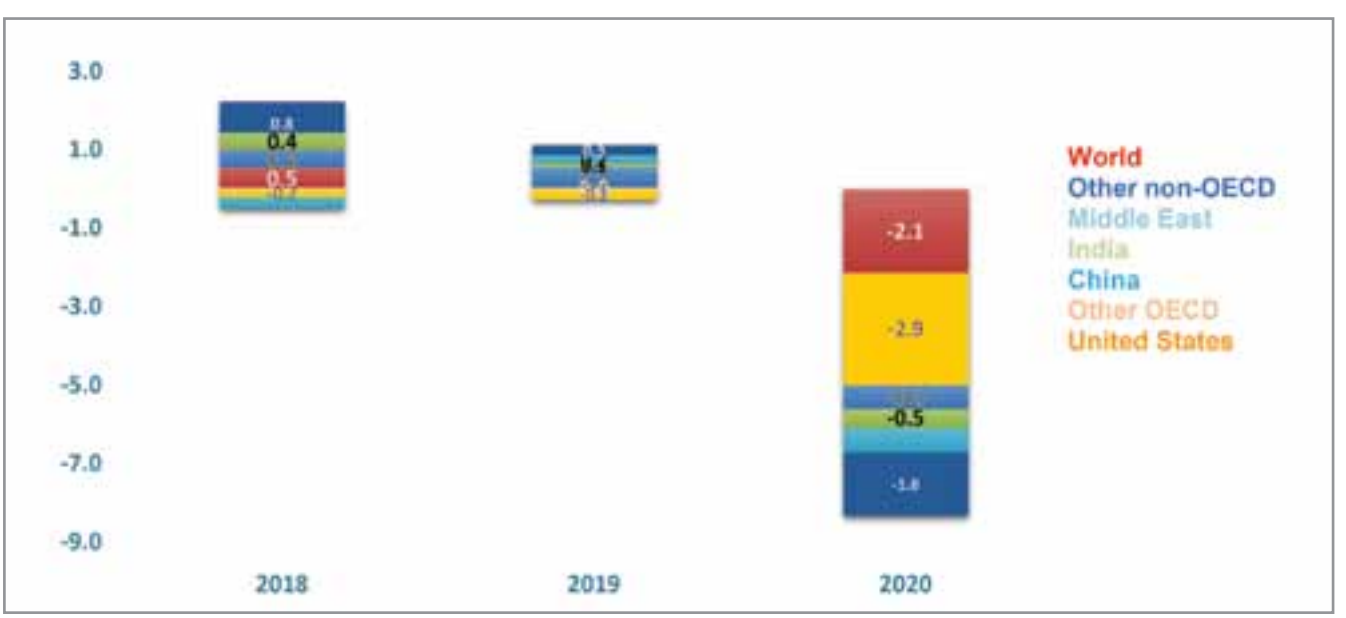
Figure 6—Using drones to detect methane leaks (Jacobs 2019 / Baker Hughes)

INDUSTRY AT A GLANCE

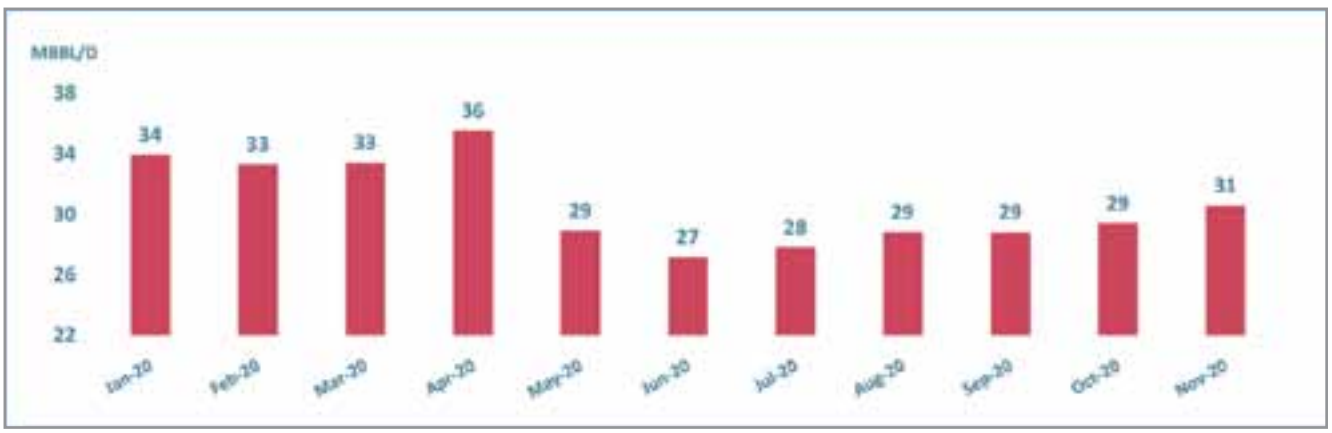
by: **Ali Ibrahim**

World liquid fuels production and consumption balance
million barrels per day

Annual change in world liquid fuels consumption
million barrels per day



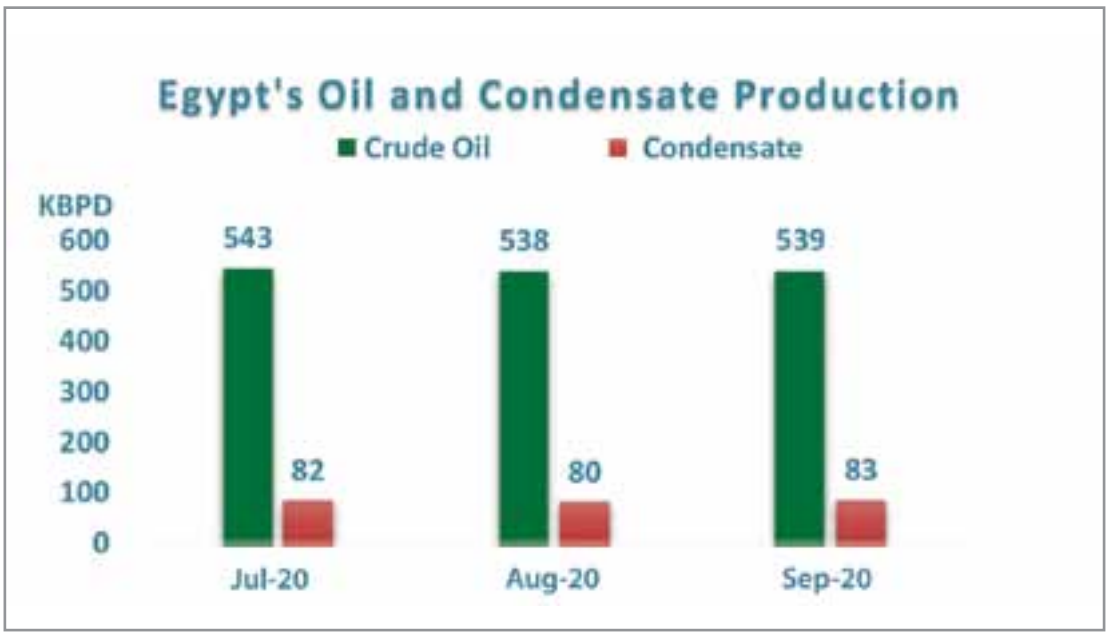
OPEC Crude Oil Production

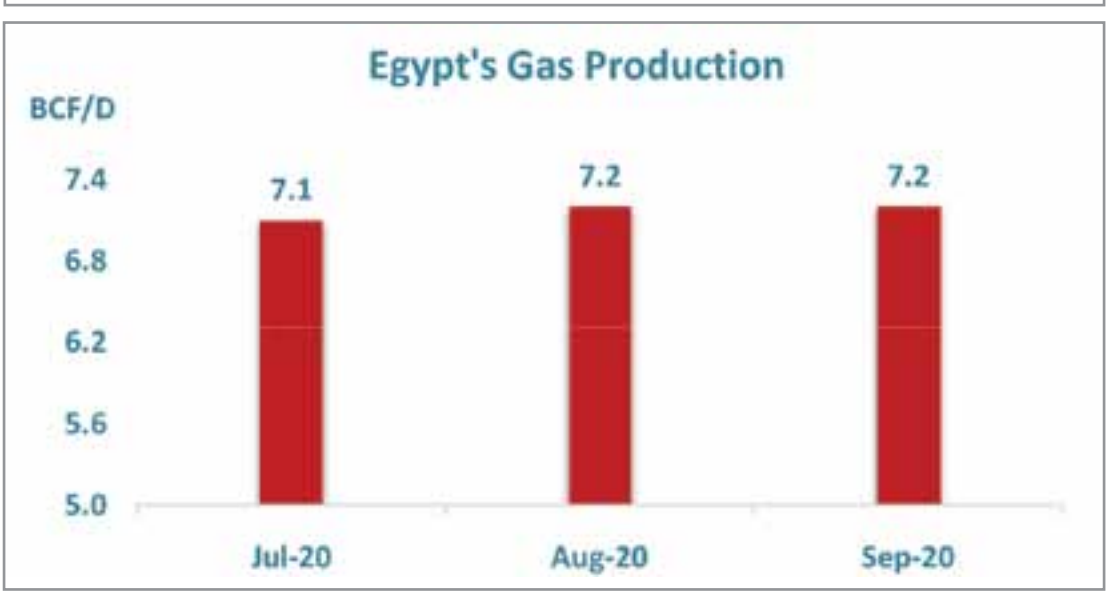


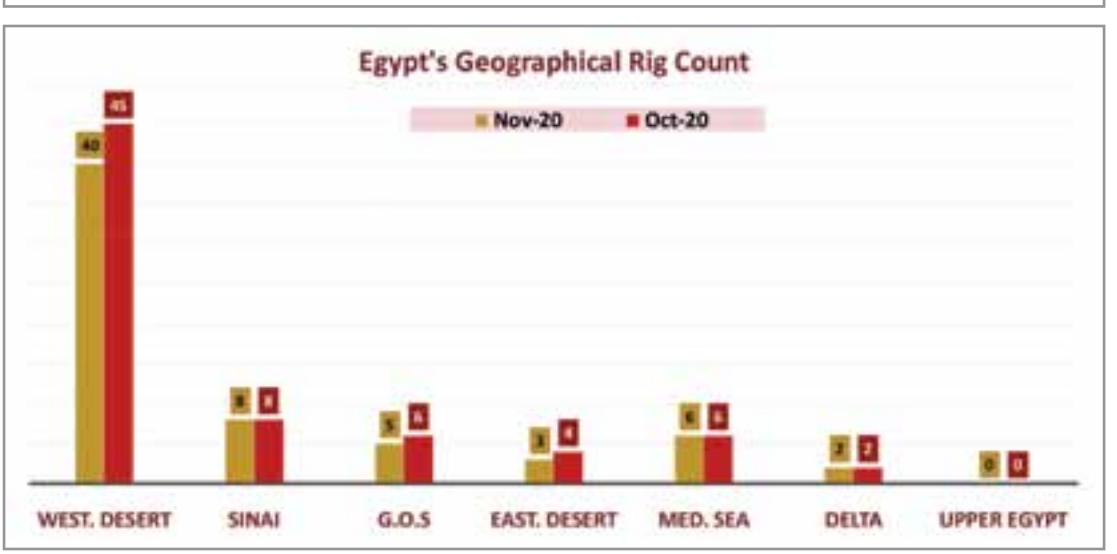
Crude Oil Prices

NYMEX Natural Gas Prices

USD/Million BTU


Egypt's Oil and Condensate Production
Crude Oil
Condensate
KBPD
600
500
400
300
200
100
0
543
82
538
80
539
83
Jul-20
Aug-20
Sep-20


Egypt's Gas Production
BCF/D
7.4
6.8
6.2
5.6
5.0
7.1
7.2
7.2
Jul-20
Aug-20
Sep-20


Egypt's Geographical Rig Count
Nov-20
Oct-20
40
45
WEST. DESERT
SINAI
G.O.S
EAST. DESERT
MED. SEA
DELTA
UPPER EGYPT

تطبيقات الأقمار الصناعية في مجال البترول

أ.د . أحمد زكريا نوح
معهد بحوث البترول

قال ستيفان دوجاريك المتحدث باسم أمين عام الأمم المتحدة، إن موضوع هذا العام للاحتفال بالأسبوع العالمى للفضاء، يأتي بعنوان "الأقمار الصناعية تحسن الحياة . وبالفعل الاقمار الصناعية تحسن الحياة .

وأسبوع الفضاء العالمي هو أكبر فعالية سنوية متعلقة بالفضاء في العالم. فهي تبنى قوى المستقبل العاملة عن طريق إلهام التلاميذ وإبراز الدعم الشعبي المشاهد لبرنامج الفضاء، وتثقيف العامة بشأن الأنشطة الفضائية، وتعزيز التعاون الدولي في التوعية بمسائل الفضاء وتعليمها. وفي عام ٢٠١٨، عقدت أكثر من ٥٠٠٠ فعالية في أكثر من ٨٠ دولة احتفالا بالأسبوع العالمي للفضاء.

فيستخدم القمر الصناعي بشكل أساسي لمسوحات الأراضي، وتخطيط المدن، وتصميم شبكة الطرق، وتقدير غلة المحاصيل، والوقاية من الكوارث والتخفيف من حدتها وأيضا تحديد أماكن انتشار الامراض خصوصا المتعلقة بارتفاع درجات حراره المرضي مثل مرض COVID-19 (كورونا) وغيرها الكثير من تطبيقات الأقمار الصناعية ومنها تطبيقات الأقمار الصناعية في مجال البترول

فمن الممكن استخدام تكنولوجيا الاقمار الصناعية في مجال الاستكشاف والحفر والإنتاج علي النحو التالى

١. في مجال الإستكشاف: يتم ذلك باستخدام مجسات Rt Sensors مشابهة لل Vibrators أوحتي ربط شبكة الأستكشاف الأرضية بمحطات فضائية في القمر الصناعي ومعرفة أماكن الإستكشاف الموجودة والجديدة بنظام passive. وأيضاً تتبع مدي نضوج الزيت من خلال درجات الحرارة بإستخدام (IR) أو Thermal sensors

٢. في مجال الحفر ونتيجة ما يتم علي مستوي

الدول المتقدمة في تسجيل لحظي Real time لكل ما يحدث علي جهاز الحفر من معلومات يمكن أن تربط أرضياً بالقمر الصناعي وبالتالي ربط المعلومات المهمة أرضياً بالشركة الأم يمكن بها إتخاذ قرارات صائبة ودقيقة وسريعة كرؤساء قطاع الحفر في الشركات وبالتالي المساهمة في إتخاذ قرارات دقيقة مرتبطة بعملية الحفر بإمان ودقة.

أيضا في مجال الحفر البحري حيث إننا مقدمون في مصر علي الحفر في المياه العميقة بالبحر المتوسط وما تمثله التحديات الكبري في الحفر في المياه العميقة منها حركة الرياح وحركة الموج وإتجاهه وبالتالي تثبيت مراكب الحفر (Drilling ships) في إتجاة الحفر ومنع فيما يسمى Riser manuplation

مما يساهم في النجاح في حفر البئر بطريقة دقيقة آمنة مثل التكنولوجيا المستخدمة في بحر الشمال –إنجلترا.

أيضاً الأعمال المتخصصة في قطاع البترول في الحفر البحرى تتطلب دقة عالية في تنفيذ وبناء الحفارات وتحديد الأماكن والاحداثيات بشكل متكامل، لذا تعتبر الخرائط من أهم الأدوات التي تعتمد عليها الصناعة بشكل أساسي.

٣. في مجال الإنتاج: يمكن ربط المعلومات الأرضية بالقمر الصناعي للكميات الإنتاج وبالتالي بصاحب قرار بحيث يمكن بسهولة إتخاذ قرار بزيادة أو تخفيض الإنتاج حسب احتياجات السوق والسعر العالمي للبترول أو التصدير .

٤. في مجال التكرير: وذلك عن طريق ربط أماكن التكرير بأماكن الإنتاج وكذلك محطات الوقود بحيث يمكن متابعة الإنتاج والسعة التخزينية للتانكات والتسويق لكل الشركات في وقت واحد (Supply and demand).

٥. ومن التطبيقات الهامة في قطاع البترول أنه يمكن متابعة التلوث البيئي للتسرب النفطي oil spells وبالتالي إيجاد حلول مناسبة بإستخدام (IR) او Thermal sensors

٦. رسم خرائط بترولية: الإستفادة من كمية المعلومات الدقيقة والكثيرة و التي تكون (Regional scale) في رسم خرائط بترولية منها بإستخدام الذكاء الإصطناعي.Artificial Intelligence

٦,١. رسم خريطة بترولية لآبار البترول مرتبط بها كمية الزيت والغاز (Saturation).

٦,٢. رسم خريطة بترولية لآبار البترول مرتبط بها ضغوط الآبار (Pressure).

٦,٣. رسم خريطة بترولية لآبار البترول مرتبط بها مصادر البترول (Source rock) وبالتالي تتبع هجرة الزيت.

٧. يمكن استخدام صور الأقمار الصناعيه في تقدير نسبه التلوث في المناطق المختلفة

٨. يمكن إنشاء وحدة خاصة بتفسير البيانات الهائلة والكبيرة الحجم في عمل مشاريع بحثية فيما يسمي Big Data analysis.

كل هذا يمكن ان يكون في خدمة مصرنا الحبيبة كالمساهمة في إتخاذ القرارات السليمة في مجال البترول بإستخدام معلومات علمية تكنولوجية متقدمةدقيقة يساهم بها علماء مصر في تخصصاتهم المختلفه في كل ما يعود بالنفع على مصرنا الغالية.

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- CST Wellhead Agency.
- Load test for elevators & handling tools.
- Manpower Supply .
- Cold Casing Cutter Services.
- Pre-heating & Welding services.
- Pressure Test Services
- Supplying Blohm & Voss Handling Tools.
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Alexandria:
Free Zone – Al Ameryia

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MIDCO
Oilfield Services (Free Zone)

Load test

The API specification 8C determines the importance of performing a proof load test for handling tools equipment in the same manner as in actual service and with the same area of the contact I the load bearing surfaces
performing such load test is avoiding any suddenly cracks might happen while using handling tools with full capacity at rigs site, as the mentioned test is done at a workshop.
Testing elevators & handling tools loading capabilities up to 750 tons – Certifying the accepted tools- load test equipment has been adapted to test different types of devices as slings and shackles with different types and sizes.

CST
CSEPEL TECHNO LTD.

CST Well Head Agency

MIDCO is an agent for CST Well head manufacture in Egypt- Hungarian company founded in 1991- Close to 50 years of experience in manufacturing assemblies for the oil & gas industry, Manufacturer of high-quality Wellhead and X-mas tree assemblies to fulfill individual customer needs worldwide- Assemblies described under API 6A and API 16A

Maintenance and Refurbishment of Well Head

Based on API Standards- Setting up Well Head- Conducting on-site &long-term well head maintenance- Service benefits are far greater than purely- providing integrity assurance for an Operator's assets.- Strict guidelines are imposed on every activity undertaken to assess risk and eliminate it-MIDCO Wellhead Maintenance is very powerful in risk elimination and meeting customer needs.

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هيئة البترول تدشن المنظومة الإدارية الموحدة للسلامة والصحة المهنية

نجحت الهيئة المصرية العامة للبترول فى الانضمام لعضوية المنظمة الدولية لمنتجى النفط والغاز (IOGP)، وبناء على معايير IOGP فقد أتمت الهيئة مشروع توحيد المعايير القياسية لإدارة السلامة الشخصية والصحة المهنية وسلامة العمليات وحماية البيئة حيث اعتمد المهندس عابد عز الرجال، الرئيس التنفيذي للهيئة المصرية العامة للبترول والكيميائي جمال فتحي، مساعد رئيس الهيئة للأمن الصناعى النظام الجديد والذى يتكون من جزئين رئيسيين الجزء الأول يتضمن نظام إدارة العمليات الخاص بالهيئة المصرية العامة للبترول (EGPC OMS). بينما يتضمن الجزء الثانى الكود الخاص بممارسة المهام المختلفة فى إطار معايير السلامة العالمية (EGPC HSE code of practice) والذى يتضمن المعايير الخاصة بتنفيذ نظام إدارة العمليات، نظم القيادة والتطوير والمتابعة، نقل المنتجات البترولية على الطرق، تحديد وتقييم مخاطر التشغيل وطرق التحكم، معايير السلامة على أجهزة الحفر البرية والبحرية، معايير السلامة الخاصة بالتحكم فى الاعمال مثل العمل على ارتفاعات ونظم عزل الطاقة وتصاريح العمل ودخول الاوعية المحصورة، معايير السلامة للتعامل مع المواد الخطرة،معايير سلامة العمليات،إدارة المقاولين ،مهمات الوقاية الشخصية ومعايير الجدارة الوظيفية للسلامة بجميع المستويات الوظيفية ،حماية البيئة والتنوع البيولوجى .وذلك تنفيذاً لرؤية مصر ٢٠٣٠ وفى إطار إستراتيجية وزارة البترول والثروة المعدنية الخاصة بتحديث وتطوير قطاع البترول على مستوى جميع عناصر العمليات الانتاجية (تطوير العنصر البشرى– تطوير طرق تنفيذ العمليات – تطوير الاصول والمعدات والمحطات) وتنفيذا لتوجيهات المهندس طارق الملا، وزير البترول والثروة المعدنية بضرورة تطبيق أعلى المعايير العالمية الخاصة بالسلامة والأمان بجميع مراحل صناعة البترول والغاز.وفى هذا الإطار فقد قامت الهيئة المصرية العامة للبترول بتعميم المنظومة الجديدة على جميع الشركات التابعة لتفعيلها وستقوم لجنة فنية متخصصة من الهيئة وممثلى بعض الشركات بمتابعة الشركات للتاكد من تنفيذ المنظومة الجديدة.

تسوية مديونيات شركات القطاع العام للبترول بالمبادلة بقطع أراضي

شهد المهندس طارق الملا وزير البترول والثروة المعدنية والدكتور هشام توفيق وزير قطاع الأعمال العام توقيع تسوية مديونيات شركات قطاع الأعمال العام المتراكمة نتيجة مسحوبات الغاز من خلال المبادلة بقطع اراضى ، وذلك بين الهيئة المصرية العامة للبترول والشركة المصرية القابضة للغازات الطبيعية إيجاس مع ٣ شركات قابضة تتبع قطاع الأعمال العام.

وقع العقود المهندس عابد عز الرجال الرئيس التنفيذى لهيئة البترول والدكتور مجدى جلال رئيس الشركة المصرية القابضة للغازات الطبيعية "إيجاس" والدكتور وسيم وهدان رئيس شركة الخدمات التجارية البترولية "بتروتريد" من جانب قطاع البترول، ومن جانب قطاع الأعمال المهندس محمد السعداوى رئيس الشركة القابضة للصناعات المعدنية والمهندس عماد مصطفى رئيس الشركة القابضة للصناعات الكيماوية والدكتور أحمد مصطفى رئيس الشركة القابضة للغزل والنسيج.

وصرح الملا ان توقيع تسوية مديونيات شركات قطاع الاعمال العام من خلال المبادلة بقطع اراضى يأتي تنفيذاً للتوجهات الرئاسية والحكومية بفض التشابك بين الوزارات بما يمكنها من تحسين أدائها وزيادة كفاءة الاقتصاد المصرى بالتخلص من التشوهات العالقة بهذا الملف لسنوات طويلة، حيث تم توقيع بروتوكول التعاون بين الوزارتين والشركات التابعة لهما بشأن آلية السداد وجدولة المديونيات المستحقة لقطاع البترول لدى شركات قطاع الأعمال العام عن قيمة مسحوباتها من الغاز الطبيعى من خلال مبادلة بعض أصولها فى إطار السداد العينى بالعقارات والأراضى وحظى البروتوكول بموافقة مجلس الوزراء مشيرا الي ان هذه التسوية تأتى من خلال اتفاق يحدد على نحو واضح مسئوليات وقدرات كل جهة، وما هو المطلوب من كل منها فى إطار من وضوح الرؤية، إلى جانب الحرص على عدم تكرار حدوث أى مشكلات مستقبلية، من خلال وجود التزامات وإطار محدد لتلك التعاملات تم التوافق عليه وفق هذا البروتوكول والذى يؤكد على سداد المستحقات الشهرية على الشركات لقطاع البترول مقابل مسحوبات الغاز بصفة دورية ومستمرة، بما يضمن تجنب حدوث أى تراكمات مالية، أو متأخرات جديدة.

وأكد الوزيران على أن سداد المستحقات المتأخرة وفقاً للبروتوكول الذى تم توقيعه له أثر إيجابى على الطرفين من حيث تحسين كفاءة الأداء داخل الشركات والتخلص من معوقات عرقلت الأداء الاقتصادى للشركات لفترات طويلة، ودعم خطط التحديث والتطوير والتحول للأداء الاقتصادى الاحترافى التى تنفذها الوزارتان ، كما تسهم فى الاستغلال الامثل لتلك الأصول، واوضحا أن الإرادة السياسية كشأنها فى التعامل بحزم مع ملفات الإصلاح وتقويم الأداء، أعطت هذا الملف دفعات قوية وساهمت فى إنجازه بنجاح.

البورصة توافق على قيد زيادة رأس مال غاز مصر

وافقت لجنة قيد الأوراق المالية على قيد زيادة رأس المال المرخص به لشركة غاز مصر من ٥٠٠ مليون جنيه إلى مليار جنيه، وقيد أسهم زيادة رأس المال المصدر والمدفوع من ٢٤٠ مليون جنيه إلى ٤٨٠ مليون جنيه، بزيادة قدرها ٢٤٠ مليون جنيه.وجاء في بيان لبورصة مصر، إن زيادة رأس المال المصدر والمدفوع موزعة على ٢٤ مليون سهم، بقيمة اسمية ١٠ جنيات للسهم، تمويلاً من احتياطي تمويل مشروعات الغاز وفقاً للقوائم المالية في ٣١ ديسمبر ٢٠١٨. وأضافت البورصة، أن الحق في التوزيع المجاني (بواقع سهم واحد مجاني لكل سهم أصلي قبل الزيادة) لمشتري السهم حتى نهاية جلسة تداول الأربعاء الموافق ٩ ديسمبر ٢٠٢٠.وأشارت إلى أنه سيتم إدراج أسهم الشركة بعد الزيادة المجانية على قاعدة البيانات، مع تحديد سعر مرجعي على أسهم الشركة اعتباراً من بداية جلسة تداول يوم الخميس الموافق ١٠ ديسمبر ٢٠٢٠.ووافقت اللجنة على قيد تعديل غرض شركة غاز مصر و ذلك في ضوء تعديل المادة (٣) من النظام الأساسي للشركة و ذلك بإضافة الأنشطة الآتية: "التوريدات العمومية للغير – المقاولات العمومية للغير"، وكذلك إضافة الفقرة "وعلى الشركة الحصول على كافة التراخيص اللازمة لمباشرة نشاطها".وأقرت اللجنة توقيع التزام مالي على الشركة قدره ١٠ آلاف جنيه مصري، نظراً لمخالفتها لأحكام المادة (٢٦) من قواعد قيد وشطب الأوراق المالية بالبورصة المصرية والمادة (٢٦) من الإجراءات التنفيذية لها، طبقاً لعقد تنظيم قيد الأوراق المالية بجداول البورصة المصرية والمبرم مع الشركة، مع منح الشركة مهلة لسداد الالتزام المالي مدتها ١٥ يوم تبدأ من تاريخ إخطارها بقرار لجنة القيد.وحققت الشركة خلال الـ٩ أشهر الأولى من العام الجاري، صافي ربح خلال الفترة بلغ ٩,٠٧ مليون جنيه، مقابل صافي ربح بلغ ٢٧,٨١٢ مليون جنيه خلال فترة المقارنة قبل عام.وارتفعت إيرادات النشاط خلال الـ ٩ أشهر الأولى من العام الجاري، لتصل إلى ٢,٥٠٦ مليار جنيه، مقابل ١,٥٦٩ مليار جنيه خلال الفترة ذاتها من العام الماضي.

تخفيض عدد العاملين ٥٠٪... البترول تصدر ضوابط تنظيم العمل الجديدة

أصدرت وزارة البترول ضوابط تنظيم العمل الجديدة في إطار خطط الحكومة الاستثنائية والإجراءات الاحترازية المتخذة من قبل القطاع وكافة الجهات التابعة لمواجهة انتشار فيروس كورونا، وللحفاظ على الصحة العامة وفق إحتياجات وصالح العمل فإنه يتم العمل باتباع ما يلي: أ-يستمر العمل بذات التوجيهات الصادرة بشان تشغيل السيدات العاملات بالشركات كما هي مسابقا . ب-لاتزيد قوة العمل بالمراكز الرئيسية عن ٥٠ ٪ مع الإستمرار في العمل من المنازل والقيام بالأعمال المطلوبة، ويتناوب العاملون وفقا لما تراه كل جهة عمل مع اتخاذ كافة التدابير والإجراءات الاحترازية والحفاظ على المسافات والتباعد الأمن في أماكن الجلوس وحسن التهوية والتطهير المستمر. جـ- بالنسبة للمواقع الإنتاجية (الحقول والمصانع) يتم التخفيض طبقا لما يراه رؤساء الشركات حفظا على الإنتاج مع تحليق التباعد الاجتماعى وحسن التهوية والتطهير المستمر.

تعليمات وزارية بسرعة بدء تنفيذ مشروع نقل الغاز الطبيعى عبر الناقلات

أكد الدكتور محمد سعد الدين، رئيس جمعية مستثمرى الغاز المسال، ورئيس مجلس إدارة مجموعة «سعد الدين للبترول» أن وزير البترول والثروة المعدنية المهندس طارق الملا أصدر تعليمات بسرعة إنهاء كافة الإجراءات والقواعد المنظمة الخاصة ببدء تنفيذ مشروع نقل الغاز الطبيعى عبر الناقلات.وقال إنه سيتم نقل ملف المشروع للهيئة العامة للبترول ، لاستكمال إجراءات وقواعد ما قبل التنفيذ والانتهاء من الحسابات والتسعيرات والتكاليف والمواصفات وغيرها. كان «سعد الدين» كشف فى فبراير الماضى عن أن مصر ستبدأ لأول مرة تنفيذ المرحلة الأولى من خطة الحكومة لنقل الغاز الطبيعى عبر الناقلات من خلال تنفيذ مجموعته مشروعاً جديداً باستثمارات ١٥٠ مليون جنيه.وقال «سعد الدين» إن وزير البترول متفهم لمطالب المستثمرين سواء فيما يخص مشروع نقل الغاز الطبيعى عبر الناقلات أو غيره من الأنشطة والمجالات.وتغطى الشبكة القومية للغاز نحو ١٥٪ فقط من مناطق مصر، وفقا لتصريحات سابقة لرئيس جمعية مستثمرى الغاز.وتستهدف الخطة الجديدة لعمليات نقل الغاز الطبيعى بدون الاعتماد على خطوط الغاز التقليدية، تغطية نحو ٨٥٪ من مساحة مصر البعيدة عن الشبكة القومية.وتابع «سعد الدين» : «تعليمات وزير البترول وتوجيهاته تبشر بقرب البدء الفعلى فى الضخ والتوريد خلال الفترة المقبلة.وقال إن المجموعة أنهت تجهيز كل شىء يخص المشروع ومستعدة للتعامل الفورى ونقل الغاز الطبيعى للعملاء عبر الناقلات ،حال إعطائها الإشارة من قبل وزارة البترول.جدير بالذكر أن «سعد الدين» أكد أن التوريد سيبدأ بالقطاع الصناعى، متابعاً: نبدأ أول تجربة بالتوريد لمصنعين فى منطقة أبو زنيمة فى سيناء، بكميات تبلغ نحو ٢٠ ألف متر يومياً.وتعليقا على ذلك أوضح «سعد الدين» أن الأهم حاليا إنهاء كل الإجراءات الخاصة بالمشروع مع الجهات الحكومية المسئولة والحصول على شارة بدء التنفيذ ،بصرف النظر عن نوعية العميل أو موقعه أو الكميات المبدئية التى سيتم توريدها، فكل تلك الأمور قابلة للتعديل والتغيير». وتعد «غازتون» التابعة لمجموعة سعد الدين المسئولة عن تنفيذ المشروع، وتم تأسيسها عام ٢٠٠٠ ويتضمن نشاطها الأساسى نقل البوتاجاز «LPG» وحصلت مؤخراً على ترخيص بمزاولة نشاط نقل الغاز الطبيعى المضغوط «CNG».ومن المرتقب أن يتم تنفيذ مشروع نقل الغاز، التابع لمجموعة «سعد الدين»، عبر ٦ ناقلات دون استخدام الشبكة القومية للغاز، بتكلفة تقترب من ٢٥ مليون جنيه للناقلة، شاملة نظام التشغيل والمرافق المتوافق مع مواصفات الأمان العالمية.

١٦٪ تراجعا فى استهلاك مصر من «بنزين ٨٠» والسولار خلال ٣ سنوات

تراجع إجمالى استهلاك السوق المحلية من بنزين ٨٠ والسولار بنسبة تقارب ١٦٪ خلال السنوات الثلاث الماضية، طبقا لجريدة المال، ليصل إجمالى الكميات المستهلكة منهما محليا إلى ١٥,٣ مليون طن بنهاية العام المالى الماضى، مقابل ١٨,٢ مليون طن خلال عام ٢٠١٦/ ٢٠١٧.ونشر المركز الإعلامى لمجلس الوزراء تقريرا حديثا كشف فيه عن انخفاض الاستهلاك المحلى من السولار بنسبة ١٤٪ ليصل إلى ١٢,٣ مليون طن عام ٢٠١٩/ ٢٠٢٠، مقارنة بـ ١٤,٣ مليون طن عام ٢٠١٦/٢٠١٧.كما لفت التقرير إلى انخفاض الاستهلاك من بنزين ٨٠ بنسبة ١٫٢٣ ليصل إلى ٣ ملايين طن عام ٢٠١٩/٢٠٢٠، مقارنة مع ٣,٩ مليون طن عام ٢٠١٦/٢٠١٧.

الملا يسلم درع الوفاء لوزراء البترول السابقين

خلال الاحتفال بعيد البترول الخامس والاربعين كرم المهندس طارق الملا وزراء البترول والثروة المعدنية السابقين المهندس سامح فهمى والمهندس محمود لطيف والمهندس عبدالله غراب والمهندس أسامة كمال والمهندس شريف هدارة والمهندس شريف إسماعيل. كما كرم أسماء وزراء البترول الراحلين المهندس على والى والمهندس أحمد عز الدين هلال والكيميائى عبدالهادي قنديل والدكتور حمدى البنبى.

«بتروجاس» جاهزة لتلبية احتياجات الشتاء من البوتاجاز

أكدت شركة بتروجاس استعدادها الكامل لاستقبال موسم الشتاء وتوفير الكميات الإضافية التى تحتاجها السوق المحلية من البوتاجاز خلال الفترة المقبلة.وبحسب مصدر مسئول فى الشركة فإن متوسط الإمدادات اليومية من البوتاجاز تراوح خلال الموسم الصيفى بين ٩٠٠ إلى ٩٥٠ ألف أسطوانة . وقال إن إستراتيجية تطوير نشاط التكرير وافتتاح المشروعات الجديدة ومن أحدثها مشروع مسطرد ،انعكس بالإيجاب على حجم الإنتاج المحلى من البوتاجاز وغيره من المشتقات البترولية.وبشكل عام تتراجع معدلات استهلاك البوتاجاز مع ارتفاع درجات الحرارة على عكس الشتاء الذى قد تتجاوز فيه معدلات الضخ اليومية حاجز ١,١ مليون أسطوانة وقت الذروة، وذلك لارتفاع حجم الاستهلاك خلال تلك الفترة.وأكد توافر رصيد إستراتيجى من البوتاجاز واحتياطى آمن يكفى لتلبية احتياجات السوق المحلية.على صعيد آخر، قال المسئول إن التوسع فى عمليات توصيل الغاز الطبيعى للمنازل ساهم فى تخفيض وترشيد معدلات استهلاك البوتاجازجدير بالذكر أن المهندس طارق الملا وزير البترول أكد – فى تصريحات خلال شهر سبتمبر الماضى – أن التوسع فى استخدام الغاز الطبيعى

بالمنازل والمحال التجارية وترشيد الاستهلاك خاصة بعد تصحيح هيكل أسعار المنتجات البترولية، أسهم فى الانخفاض النسبى فى معدلات الاستهلاك المحلى من البوتاجاز بنسبة ٥,٤٪ خلال العام. وشكلت الحكومة لجنة التسعير التلقائى للوقود العام الماضى، بعضوية وزارتى البترول والمالية، لمراجعة أسعار البنزين والسولار والمازوت لغير استخدامات الكهرباء والمخابز كل ٣ شهور.

إيني تسوي نزاعًا بين مصر وناتورجي الإسبانية لإعادة تشغيل مصنع دمياط للإسالة ٢٠٢١

أبرمت عملاق النفط الإيطالية إيني اتفاقا مع الحكومة المصرية و"ناتورجي" الإسبانية، يمهد الطريق لإعادة تشغيل مصنع دمياط لإسالة الغاز الطبيعي اعتبارا من الربع الأول من العام المقبل، وذلك بعد توقف دام ٨ سنوات ، وفق بيان صادر عن إيني.وبناء على اتفاق التسوية، ستخرج ناتورجي من يونيون فينوسا جاس الشركة الإيطالية الإسبانية المشتركة التي تدير المصنع، وستتوزع حصتها في مصنع دمياط بين إيني والشركة المصرية القابضة للغازات الطبيعية (إيجاس) والهيئة العامة للبترول.طبقا للاتفاق يصبح مصنع دمياط للإسالة مملوكا بنسبة ٥٠٪ لإيني و٤٠٪ للشركة المصرية القابضة للغازات الطبيعية (إيجاس) وللهيئة العامة للبترول بنسبة ١٠٪. وستتولى إيني أيضا شراء الغاز الطبيعي للمصنع، وستتلقى حقوق الإسالة المقابلة.وكان اتفاق مماثل بين إيني وناتورجي والحكومة المصرية قد انهار في أبريل الماضي، بعد شهر واحد من التوصل إلى اتفاق مبدئي حول إعادة تشغيل المصنع. وعزت نانورجي حينها فشل الاتفاق إلى عدم استيفاء عدد من الشروط، فيما نقلت وكالة رويترز عن مصدر مطلع، لم تسمه، قوله إنه تعذر استيفاء الشرط الأول من شروط الاتفاق والخاص بإعادة فتح المجمع، بسبب القيود المفروضة على التنقلات والصناعة في أنحاء العالم من أجل احتواء فيروس "كوفيد-١٩".

وكانت شركة إيني الإيطالية تخطط لتصدير كميات من حصتها في الغاز المنتج من حقل ظهر عبر مصنع دمياط للإسالة خلال العام الحالي، وفق ما ذكره مصدر مطلع لجريدة البورصة أمس. ولم يذكر المصدر مزيدا من التفاصيل حول حجم تلك الكميات أو الموعد المستهدف لبدء التصدير.

ومن المقرر أن يستأنف مصنع الإسالة البالغ إنتاجه ٥ ملايين طن سنويا، العمل بحلول يونيو المقبل بعدما تمت تسوية النزاع حوله منذ توقف الحكومة المصرية عن إمداد المصنع بالغاز في عام ٢٠١٢. وأفادت تقارير في يونيو الماضي أن وزارة البترول منحت بالفعل الشركة الإيطالية موافقة للبدء في تصدير جزء من حصتها في إنتاج الحقل، موضحة أن القرار جاء بعد تأكد الوزارة من التزام إيني بتلبية احتياجات السوق المحلية ووجود فائض من إجمالي الإنتاج.

إيجاس: استهلاك الغاز يقارب الـ ٦,٤ مليار قدم يوميًا والاكتشافات الجديدة ضاعفت الإنتاج

صرحت مصادر بالشركة القابضة للغاز الطبيعي "إيجاس"، أن استهلاك الغاز الطبيعي ارتفع إلى قرابة الـ ٦,٤ مليار قدم مكعب يوميًا، بالتزامن مع تزايد الأنشطة الصناعية والاستهلاكية التي باتت تعتمد على الغاز كوقود رئيسي لإتمام التشغيل. وتجاوز إنتاج مصر من الغاز حاجز الـ ٧ مليارات قدم مكعب يوميًا، بعد دخول عدد من الاكتشافات الجديدة مرحلة التشغيل الفعلي، خاصة في المياه العميقة بالبحر المتوسط.أشارت المصادر إلى أن استهلاك الغاز بالسيارات والمركبات ارتفع خلال العام المالي الماضي، بنحو ٥٥٪ شهريًا، موضحة أن استهلاك المركبات من الغاز بالسوق ارتفع إلى قرابة الـ ٤٨ مليون متر مكعب خلال ٢٠٢٠/١٩، ما يدعم توجه الدولة لتقليص استيراد المنتجات البترول على رأسها البنزين والسولار، حيث يمثل الاستيراد الخارجي نحو ٣٠٪ من استهلاك السوق من الوقود.لفتت إلى توصيل الغاز لـ ٢,٣ مليون وحدة سكنية بزيادة نسبتها ١٥٪ عن المُخطط، وتوصيل الغاز الطبيعي إلى ١٤١ منطقة جديدة لأول مرة، وتحويل ٧٤,٦ ألف سيارة للعمل بالغاز الطبيعي،

خلال الفترة من يوليو ٢٠١٨ وحتى يونيو ٢٠٢٠.وتمكنت الشركة القابضة للغاز الطبيعي من تنفيذ عدد من المشروعات الغازية خلال العام المالي ٢٠٢٠/١٩، بقيمة ١,١ مليار دولار، لدعم عمليات الإنتاج.

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