

Oil Review

Oil · Gas · Petrochemicals

Africa

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Nigeria and Ghana

Big plans for West African oil and gas

Information technology: Big data and AI

Operations: Maritime safety and EOR

Human resources: Safety and recruitment

East Africa Oil & Gas Summit preview



Marisol Ovono Nchama,
Elite Construcciones, p34



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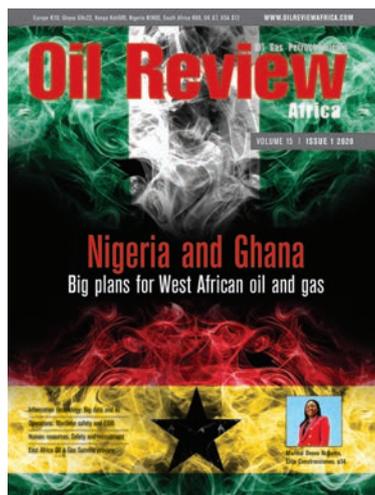
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The latest developments in Nigeria and Ghana, from page 15.

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EDITOR'S NOTE

THE NEW YEAR is well and truly upon us and 2020 is set to be another busy one for the African oil and gas industry. While the world remains an often volatile and challenging place, there are plenty of reasons for optimism across the continent.

Regional cooperation continues to be a strong theme. As well as the ever-closer African Union seeking to make trade across borders easier than ever, neighbouring countries are looking at ways to cooperate. From page 15, we look at developments in Nigeria and Ghana – as well as exciting projects making good progress, such as the Dangote refinery, developing the gas sector has become an important priority, particularly in regard to boosting access to energy. The burgeoning gas sector in nearby Equatorial Guinea is becoming more important to the West African region, and countries such as Nigeria and Ghana are set to benefit.

Whatever 2020 may hold for the industry, *Oil Review Africa* will be there to keep you updated.

Georgia Lewis
Managing Editor

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Executives Calendar 2020

FEBRUARY

25-27 SAIPEC 2020
Lagos
www.saipec-event.com

25-27 IP Week
London
www.ipweek.co.uk

MARCH

18-19 The 6th East Africa Oil & Gas Summit and Exhibition
Nairobi
www.eaogs.com

APRIL

13-16 SOGAT
Abu Dhabi
www.sogat.org

23-24 International Conference on Oil, Gas & Petrochemical Engineering
London
www.waset.org

MAY

4-7 OTC
Houston
www.2020.otcnet.org

20-21 Africa E&P Summit
London
www.africaepsummit.com

27-28 Senegal Oil & Power 2020
Dakar
www.senegaloilandpower.com

JUNE

16-17 Angola Oil & Gas 2020
Luanda
www.africaoilandpower.com/event/angola-oil-gas-2020

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

East Africa Oil & Gas Summit celebrates six years in Nairobi

THE SCOPE, SCALE and spread of current and future oil and gas infrastructure development projects in East Africa is positioning the region as a hotbed of oil and gas exploration, investment and development. This flurry of activity across multiple markets makes it an exciting time for the East Africa Oil & Gas Summit (EAOGS) to celebrate its sixth anniversary.

Since its inception, it has grown to become an important event not just for the East African oil and gas industry but for the wider continent. Important projects in this region have the power to bring energy, jobs and economic transformation beyond the east coast of the continent. This year, more than 30 countries will be participating with 450+ delegates expected and more than 400 companies represented.

EAOGS annually provides a



Image Credit: Aolhe Stock

platform for East African ministries and national oil companies to engage with international and local investors to examine, discover and debate the vast opportunities across East Africa's oil and gas sector.

The summit incorporates two strategic conferences, and annually features more than 35

high-level speakers including ministry officials, senior executives and industry experts.

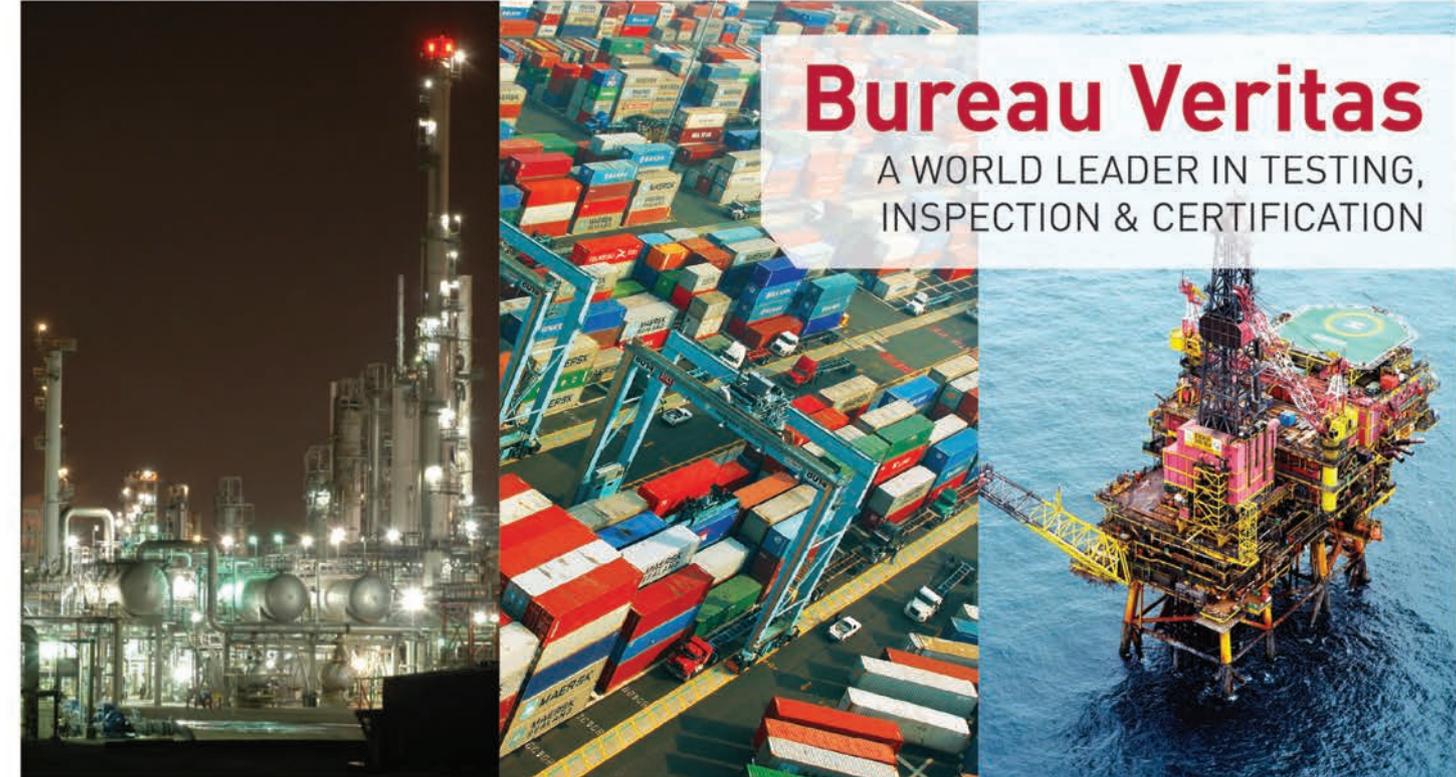
The conference programme will be wide-ranging with topics including exploration and production updates, community engagement, attracting investment and project finance, emerging markets, the role of

service companies and developing the power sector for the East African region.

Additionally, there will be an international exhibition where companies can display their latest products and services to their strategic target audience of oil and gas decision-makers from around the world.

Networking opportunities are another important aspect to the event. Throughout EAOGS, an emphasis is placed on interaction between all participants of the event to ensure the best possible access for everyone. All participants can take advantage of the exclusive Business Matching service, allowing them to pre-arrange meetings with other attendees through an easy-to-use technology platform.

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These Acts provide for Petroleum Agency SA to evaluate and promote oil & gas potential exploration and production activities in South Africa, to regulate oil & gas exploration and production industry and to archive all geotechnical data produced through oil & gas exploration.

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Saipem wins major contracts in Angola and Equatorial Guinea

ITALIAN OFFSHORE CONTRACTOR Saipem has been awarded several EPCI contracts in various countries around the world worth more than US\$500mn, including major deals in Angola and Equatorial Guinea.

Saipem has been assigned a contract by Eni Angola related to Cabaça and Agogo Early Phase 1 developments. The scope of work includes the EPCI of risers, production flowlines, jumpers and the installation of a Subsea Production System (SPS) in water depths up to 600m to be carried out by Saipem vessels FDS and Saipem 3000.

In Equatorial Guinea, Saipem has signed a contract with Noble Energy for the offshore installation of a 70km gas pipeline connecting the Alen Platform to Punta Europat.



Eni's offshore work will be boosted with the Saipem contract.

Elsewhere, the company has been awarded an offshore contract in Saudi Arabia for Saudi Aramco, as well as minor contracts in the Thistle Field in the North Sea and the Gulf of Mexico.

Francesco Racheli, Saipem E&C Offshore Division COO, commented, "These new contract

awards confirm the diversified nature of our core market segments and contribute to consolidating the historic relationship with our clients who know they can constantly rely on our support in order to pursue their safety, efficiency and reliability targets."

Somalia's petroleum law has been ratified after parliamentary approval

FOLLOWING APPROVAL BY Somalia's upper and lower houses of the country's Federal Parliament, the Petroleum Law has been ratified by President Mohamed Abdullahi Farmajo. The Ministry of Petroleum and

Mineral Resources of the Federal Republic of Somalia stated that the ratification is a landmark moment in the development of Somalia's resources, and it will be transformational for the country's development.

The law includes provisions that the country's oil and gas will belong exclusively to the Somali people. It further embeds a revenue-sharing agreement to ensure that the revenues will be distributed among the Somali people through the Federal States. According to the government, future hydrocarbons revenues will be invested in the continuing rebuilding of the country's infrastructure, particularly in education, security and healthcare.

"The Petroleum Law demonstrates the capacity of the Somalian people to unite in a historic effort to work together to build an equitable, prosperous and peaceful nation," said President Mohamed Abdullahi Farmajo.



Mohamed Abdullahi Farmajo, the Somalian president.

Africa Oil closes Petrobras acquisition

CANADA-BASED AFRICA OIL has announced the closing of the acquisition of a 50 per cent ownership interest in Petrobras Oil and Gas B.V. (POGBV).

BTG Pactual E&P B.V. will continue to own the remaining 50 per cent of POGBV.

The total cash payment by Africa Oil to close the acquisition, including the Nigerian Government's consent fee, amounted to US\$519.5mn. This included a deferred payment of US\$24.8mn which is due by end of June 2020.

The primary assets of POGBV are an indirect eight per cent interest in Oil Mining Lease (OML) 127 and an indirect 16 per cent interest in OML 130. OML 127 is operated by affiliates of Chevron Corporation (Chevron) and contains the producing Agbami Field. OML 130 is operated by affiliates of TOTAL S.A. (TOTAL) and contains the producing Akpo and Egina Fields.

Africa Oil CEO Keith Hill commented, "We are very pleased to have acquired an interest in these established, low unit cost, producing assets with additional appraisal and development upside, that are operated by some of the best companies in the industry.

"With the addition of production and cash flow, Africa Oil is transforming into a significant, Africa-focused independent E&P company. Combining these assets with our Kenya development project and exploration portfolio, we believe that Africa Oil has tremendous growth potential in a range of oil price scenarios," Mr Hill added.



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Angolan government set to privatise 30 per cent of Sonangol by 2022

ANGOLA'S MINISTER OF Mineral Resources and Petroleum Diamantino Pedro Azevedo has announced that the government had made significant progress in its efforts to restructure the oil and gas sector.

Speaking at an Africa Oil & Power event in London he highlighted recent achievements in regard to making the Angolan oil sector more efficient since the change in government in 2017.

These include significant cost reductions at Sonangol that have led to the government deciding to list up to 30 per cent of the company. The government believes that this will enable the company to raise money for investment and increase its competitive edge.

Further reforms include the privatisation of Sonangol



The Angolan petroleum minister speaking in London.

Image Credit: Africa Oil & Power

subsidiaries that do not belong to the NOC's core business of exploration and production. This privatisation process offers significant opportunities for new entrants into Angola's oil and gas sector. Initial projections point to

foreign direct investment flows of up to US\$10bn in the next three years, as external players move in to take over from Sonangol in major support service roles previously fulfilled by the NOC.

Nigeria to contribute 35 per cent of Africa's oil and gas transmission pipelines

DATA AND ANALYTICS company GlobalData has said that Nigeria will contribute around 35 per cent of Africa's total planned and announced oil and gas new-build

trunk/transmission pipeline length additions between 2019 and 2023. The company's latest report, 'Global Planned Oil and Gas Pipelines Industry Outlook to 2023 – Capacity and Capital

Expenditure Outlook with Details of All Planned Pipelines', revealed that Nigeria is expected to provide 6,601.5km of new-build pipeline by 2023.

The company stated that most of the additions will constitute natural gas, at 6,460km, while crude oil pipelines will account for 142km.

Varun Ette, oil and gas analyst at GlobalData, commented, "In Nigeria, 11 new-build pipelines are expected to start by 2023. Of these, eight are planned projects and the remaining three are from early-stage announced projects. Trans Saharan Gas is the longest upcoming pipeline in the country with a length of 4,400km. This announced natural gas pipeline is expected to start operations in 2021."



New projects will boost the Nigerian pipeline sector.

Image Credit: Adobe Stock

Eni signs LNG supply agreement with Nigeria

SUPERMAJOR ENI HAS signed a new long term contract for the purchase of 1.5mn tonnes of LNG with Nigeria LNG Limited (NLNG), a joint venture between NNPC, Shell, Total and Eni (with Eni having a participating interest of 10.4 per cent).

The LNG will be produced from the existing Trains one, two and three located in Bonny Island, Nigeria.

Eni, through its local affiliate NAOC, is also one of the suppliers of the liquefaction plant, thus contributing to the valorisation of associated gas resources in Nigeria.

The deal, together with the one for 1.1mn tonnes of LNG executed last December between Eni and NLNG, allows Eni to increase its global LNG portfolio starting from 2021 and to support further the development of its presence in the main destination markets worldwide.

This follows on from a significant onshore gas and condensate discovery made by Eni last year in the Niger Delta.

The major find is located in the deeper sequences of the Obiafu-Obrikom fields, in OML61, onshore Niger Delta.

The well has reached a total depth of 4.374m with the gas and condensate accumulation within the deltaic sequence of Oligocene age comprising more than 130m of high quality hydrocarbon-bearing sands. It amounts to about 1tcf of gas and 60mn barrels of associated condensate in the deep-drilled sequences.

For more on the Nigerian oil and gas industry, turn to our cover story on page 15.



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CGG delivers 3D seismic data from Mozambique

CGG HAS ANNOUNCED the final 3D PSDM seismic dataset from its 15,400 sq km multi-client survey of the outer Zambezi Delta in the Mozambique Basin is available for license. The data was acquired over blocks Z5-C and Z5-D and surrounding open acreage as part of a multi-client programme agreed between CGG and Mozambique's Instituto Nacional de Petroleo (INP).

The final PSDM data identifies major stratigraphic intervals for a better understanding of the petroleum system and, in conjunction with the high-resolution gravity and magnetic data, brings new information on the basin morphology and its evolution.

CGG's advanced imaging workflow, including full-waveform inversion (FWI), reveals a high level of detail in this complex geological setting, such as the complex deep marine turbiditic system and associated frontal splays, and the complex faulting pattern and internal architecture of the Beira High.

Equatorial Guinea launches major investment programme for 2020

EQUATORIAL GUINEA'S MINISTRY of Mines and Hydrocarbons (MMH) has started a year-long investment campaign to drive capital investment into the country's bankable projects, with the notable investment-ready projects including the construction of modular oil refineries, gas import terminal and LPG storage tanks.

Major USA firms have pledged to increase their investment in Equatorial Guinea, along with Nigerian banking and financial institutions.



An aerial shot of Equatorial Guinea's gas mega-hub.

As part of its initiative, the MMH is targeting US\$1bn in

foreign capital to be channelled into investment opportunities.

Aker Energy Ghana appoints Kadijah Amoah as new country director

AKER ENERGY AS has announced the appointment of Mrs Kadijah Amoah as country director of Aker Energy Ghana.

"We are very pleased to strengthen our team and presence in Ghana with Kadijah as the country director of Aker Energy in Ghana. With Kadijah's experience, I am confident that she will lead with success as we move towards the development phase of the

Pecan project offshore Ghana," said Svein Jakob Liknes, CEO of Aker Energy AS.

Mrs Amoah is on the executive management team of Aker Energy AS in addition to heading the country office in Ghana. She will work closely with AGM Petroleum Ghana Limited and Aker Ghana Investment Company, which have the same majority owner as Aker Energy,

and hold directorships in both companies.

"I am extremely pleased to join Aker Energy at such an important stage of the company's history. Building on the Aker group's 180 years' industrial heritage, Aker Energy will, together with AGM and AGIC, take the lead to develop Ghana's oil and gas resources and related industries," said Mrs Amoah.



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ExxonMobil secures Egyptian exploration acreage

EXXONMOBIL HAS SECURED more than 1.7mn acres for exploration offshore Egypt. Mike Cousins, senior vice-president of exploration and new ventures at ExxonMobil, said, "These awards strengthen our exploration portfolio in the Eastern Mediterranean."

The acquisition includes acreage in the 1.2mn North Marakia

Offshore block, which is located approximately five miles offshore Egypt's northern coast in the Herodotus basin. The remaining 543,000 acres is in the North East El Amriya Offshore block in the Nile Delta.

ExxonMobil will operate both blocks and hold 100 per cent interest. Operations, including the acquisition of seismic data, are scheduled to begin in 2020.



The Nile Delta could prove profitable.

Image Credit: NASA, Johnson/Fisher

APICORP seeks to boost Algerian energy development

THE ARAB PETROLEUM Investments Corporation (APICORP) has agreed two loan facilities worth a combined US\$250mn with Sonatrach Petroleum Investment Corporation (SPIC), a subsidiary of Sonatrach International Holding Corporation owned by Sonatrach, the Algerian state-owned national oil company.

The first loan, a US\$100mn bilateral pre-financing facility, will fund the maintenance of the Sonatrach Raffineria Italiana complex in Sicily, Italy, which Sonatrach acquired from ExxonMobil in 2018. The second loan, worth US\$150mn, is for the purchase Saudi

Aramco crude oil by Sonatrach Raffineria Italiana.

Dr Ahmed Ali Attiga, CEO of APICORP, said, "This is part of our mission to continue playing an active role in the development of our member countries' broader energy sector and contribute to the diversification and geographic expansion. As a trusted financial partner to the region's energy sector, we remain steadfast in our mission to continue exploring opportunities in Algeria and other member states, and provide solutions that drive innovation and bolster the sustainability of this vital industry."

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MAJOR PROJECTS AND REGIONAL COOPERATION FOR NIGERIA

With a new petroleum minister settling into his position, major projects, such as the Dangote refinery, going ahead and a spirit of regional cooperation bringing Nigeria closer to its neighbours, 2020 promises to be an exciting year. Georgia Lewis reports.

WHILE THE ATTEMPTED passage of Nigeria's Petroleum Industry Bill reaches its second decade, the ongoing parliamentary wranglings over this legislation have not stopped industry leaders from making progress on major oil and gas projects and regional cooperation.

The Dangote refinery project

The most obvious major project to make progress is the Dangote refinery, which is now slated for completion by the end of 2020. Once operational, the Lekki Free Zone plant is expected to have the capacity to meet more than Nigeria's entire fuel consumption needs, at 650,000 bpd. This has the potential to transform the country's economy.

At present, Nigeria has to import all its refined product needs, sending its own hydrocarbons elsewhere for processing. According to Nigeria's *The Guardian* newspaper, the Warri refinery in Port Harcourt ceased production in March last year, with Eni and Maire Tecnimont evaluating the site to determine what rehabilitation work needs to be done to ensure the Warri plant is operational again.

There is brighter news from the Waltersmith Modular Refinery project. In December



The Dangote group is working closely with Nigerian government officials on the major refinery project.

2019, Nigeria's Minister of State for Petroleum Resources, Chief Timipre Sylva, and Simbi Wabote

“ At present, Nigeria imports all its refined products, but projects such as the Dangote and Waltersmith refineries could be game-changers”

paid an inspection visit to the site. Phase one has been completed and it is expected that ground will be broken on phase two in May this year. The plan is for this refinery to deliver 25,000 bpd of refined crude and condensate for gasoline, diesel, LPG, kerosene and aviation fuel.

Time will tell if the opening of the Dangote and Waltersmith refineries will be the catalysts to get other Nigerian downstream projects launched or stalled projects moving again.

As well as the refinery, Dangote is constructing a fertiliser factory on the same site, to further boost the downstream value chain for Nigeria.

Working with neighbours

Regional cooperation has been a buzzword at African oil and gas industry events in recent years. African countries are increasingly working together in geographically close blocs, such as ECOWAS, and the African Union growing closer as a large economic entity. In this context, it comes as no surprise that Nigeria has been working closely with nearby neighbours.

Particularly, Nigeria has strengthened its ties with Equatorial Guinea, which is emerging as an important new player in the West African hydrocarbons industry, especially with gas development.

Equatorial Guinea's Gas Megahub, located north of Bioko Island, has the potential to become an important cross-border link with gas projects in countries such as Nigeria and Cameroon. Gabriel Mbaga Obiang Lima, Minister of Mines

“ Equatorial Guinea is an example of a country that is working closely with Nigeria in terms of oil and gas regional development”

and Hydrocarbons of Equatorial Guinea, has met with high-level Nigerian investors, bankers and financiers to discuss the opportunities. This is part of Equatorial Guinea's Year of Investment initiative for 2020.

Delegates from Nigeria at the January meeting included executives from the Africa Finance Corporation, Polaris Bank, Sterling Bank, First Bank, UBA and Zenith Bank, and Simbi Wabote, Executive Secretary of the Nigerian Content Development and Monitoring Board. While Nigeria's refining sector is still in need of investment and development, the Dangote project aside, the Gas Megahub could provide a solution, at least in the short- to medium-term, bring stranded, associated and flared Nigerian



Image Credit: African Energy Chamber

Nigeria and Equatorial Guinea work together on oil and gas development.

gas to Equatorial Guinea for processing and commercialisation opportunities.

Waltersmith, which is building a Nigerian refinery, has acquired oil and gas block EG-23, located in Equatorial Guinea's Niger Delta basin, which reflects

plans to develop oil and gas in Nigeria at a local and regional level. Waltersmith chairman Abdulrazaq Isa said he appreciated the confidence shown in the company by the government of Equatorial Guinea in granting the license. ♦

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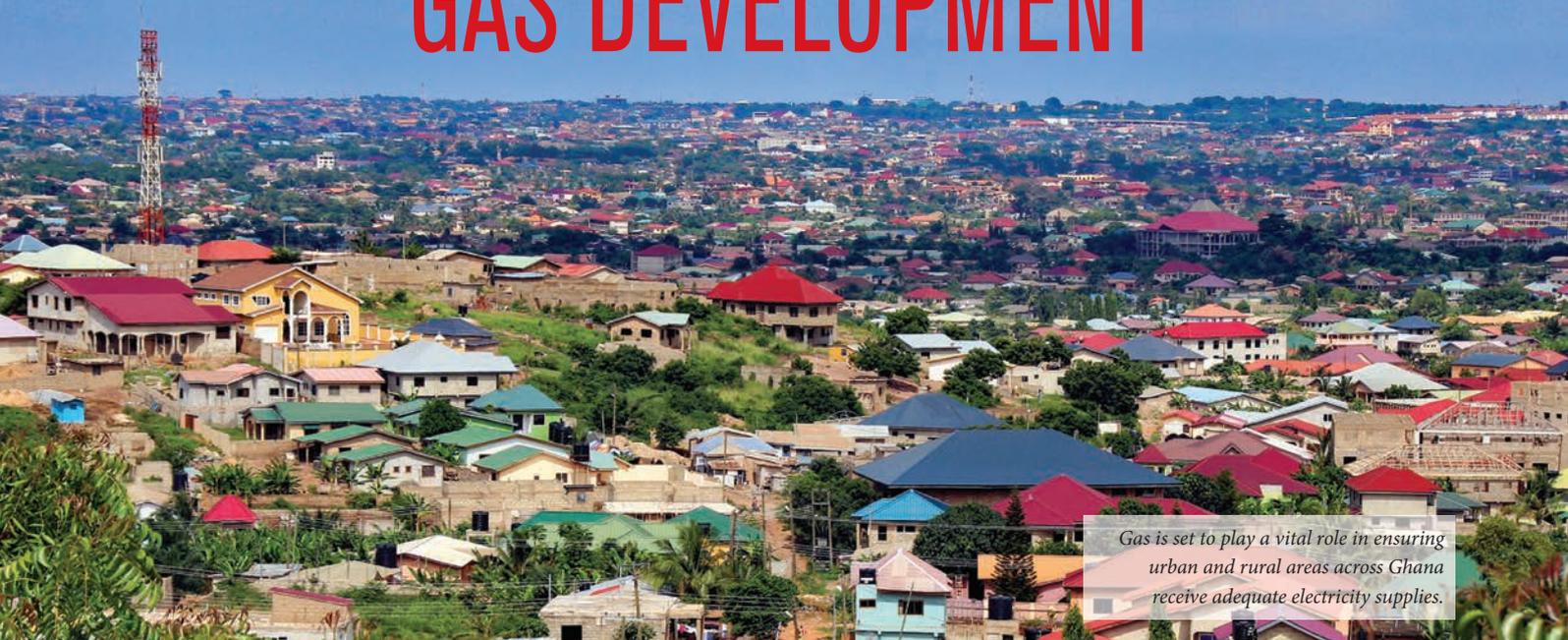


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GHANA TO POWER ON WITH GAS DEVELOPMENT



Gas is set to play a vital role in ensuring urban and rural areas across Ghana receive adequate electricity supplies.

The gas sector is becoming increasingly important in Ghana. Exciting projects, important deals and big ambitions are set to contribute enormously to meeting energy needs across the country. Georgia Lewis reports.

GHANA HAS TAKEN a largely sensible approach to the development of its hydrocarbons industry and this is set to pay handsome dividends for the ambitious west African country.

At Africa Oil Week last year, Mohammed Amin Adam, Ghana's deputy minister for petroleum, emphasised this no-nonsense approach to managing oil and gas projects. He told delegates that plans to revise laws on oil and gas licenses, which have been sent to parliament, are part of a concerted effort to stimulate production. Licenses will be revoked from four companies which have not developed their assets.

Mr Adam added that the proposed legislative changes would allow companies in

producing blocks to explore elsewhere in the same area without having to obtain a new license.

ENI's Offshore Cape Three Points (OCTP) offshore gas project has long been a major success story for Ghana. Last

“ Ghana is focused on using gas, both local and imported, to develop domestic power generation and meet its growing energy needs”

year, the project reached full production, producing 80,000 boe per day.

This impressive level of production will go a long way towards meeting the energy needs across Ghana. The focus is on providing domestic gas supply to national thermal power plants for at least the next 15 years across urban and rural areas.

The 15-year timeframe ties in well with the Ghana Renewable Energy Master Plan, which was presented to the Ministry of Energy by the Energy Commission last year. This ambitious plan constitutes an investment-focused framework for the development and promotion of the country's renewable energy resources to propel economic growth, improve social life and reduce

climate change effects.

Targets include increasing the penetration of renewable energy in the national energy generation mix from the 2015 baseline of 42.5MW to 1363.63MW by 2030, cutting the dependence on biomass as the main fuel for thermal energy applications, and provide renewable energy-based decentralised electrification options in 1,000 off-grid communities. Gas, as the cleanest burning of the fossil fuels, has great potential to be a bridging fuel as Ghana works towards increasing the use of renewables in the energy mix.

A renewed impetus in energy sector resources is enabling improved power availability and less dependency on imported energy for Ghana.

Ghana's oil production is

forecasted to rise to 500,000 bpd by 2030 and the Atuabo gas plant is expanding output to 220 million standard cubic feet of gas per day (mmscfd) by 2024.

LNG is also playing an important role in Ghana's gas sector. The country has big plans to become sub-Saharan Africa's first LNG importer this year as the Tema LNG terminal project nears completion. This project will be able to cover 25 per cent of the total electricity generation capacity for Ghana, with gas as a cheaper, cleaner fuel than oil.

A deal with Rosneft, the Russian energy company, will assist Ghana in diversifying gas imports away from Nigeria, which has not always been a reliable source of gas for meeting growing energy demand. Technology will play an important role here – advances in storage and regasification will help develop rapid LNG solutions which could set an example for markets across the region where gas reserves are ample, such as Senegal, Mauritania and



Image Credit: keso s/Flickr

Standard Bank is among the South African banks investing in Ghana.

Equatorial Guinea.

Vantage Capital has exited its Genser Ghana investment, a US\$18.5mn infusion of funds which allowed Genser to develop major projects including two power facilities with a combined output of 35MW, as well as a 30MW power plant contracted by Kinross Gold Corporation's

Chirano mine. Vantage's exit was financed by a consortium of South African banks, including Standard Bank, Nedbank and the Development Bank of Southern Africa. The additional debt now provided by the incoming South African banks will enable Genser to further expand the total capacity of its

existing plants from 100MW to 190MW. Genser also intends to build an additional 190km of natural gas pipeline to connect the rest of its power plants, and, once completed, Genser will have increased the onshore natural gas pipeline infrastructure in Ghana by nearly 160 per cent. ♦

International safety conference comes to Nigeria in April

PORT HARCOURT, known as the Garden City of Nigeria, will play host to the International Association for Safety and Survival Training (IASST), which will be holding its 76th Conference and Seminar Meeting in conjunction with Tolmann Allied Services. The event will be held from 1-5 April, 2020.

Sir Emmanuel Onyekwena, IASST In-Country Representative, Nigeria is welcoming delegates in advance to the event.

"We are privileged to host dignitaries such as you, to the Garden City of Nigeria, popularly called Port Harcourt City," said Sir Emmanuel. "It is our desire to ensure that every minute spent with us is worth the visit."

The main topic of the conference will be "Navigating Safety at Sea & the Global Perspective". The global perspective reflects the increasingly interconnected world in which oil and gas work in Nigeria - where companies and governments cooperate with their close regional neighbours and partners as well as the wider continent and the rest of the world.

"Safety is an essential resource in our daily activities to achieve set goals at minimal risk. Due to activities in the maritime industry, seafarers must be well informed, especially in the area of maritime and navigational training and operations," Sir Emmanuel Onyekwena said.

The topic for the conference has been carefully chosen, taking into consideration the volume of activity at sea. This is against the backdrop that Nigeria recently obtained the FID for the Train 7 NNLNG Project.

"This project is expected to create no fewer than 200,000 direct jobs,



Image Credit: IASST

Sir Emmanuel Onyekwena welcomes you to Port Harcourt.

90 per cent of which are maritime activities across the supply chain," Sir Emmanuel observed. "As the IASST In-Country Representative in Nigeria, we are honoured to welcome you to the 76th Conference and Seminar Meeting of the IASST."

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LEVERAGING BIG DATA FOR COST-EFFECTIVE OPERATIONS

In a webinar, Russell Herbert, oil and gas industry principal for OSIsoft, talked about the importance of data strategy for modern oil and gas operations.

Amr Bakkar reports.

"THERE IS DEFINITELY a lot of confusion around the industry," said

Russel Herbert, oil and gas industry principal, OSIsoft.

"As part of my role, I spend a lot of time face to face with customers talking about technology and what's happening in the world of digital transformation and real time data in oil and gas. We still hear confusion of people's thoughts about our technology and data infrastructure," he said when he introduced the webinar.

Much of the confusion in regard to big data is in regard to the misconception that this technology is simply a source of data – but there is more to this sector than mere numbers or

lists. Herbert pointed out that real time operations and PI System have been in oil and gas for 15-20 years, but there is still low awareness of this technology in the oil and gas industry.

Herbert defined PI System as "a software platform, data foundation and operational

“ We still hear confusion about people's thoughts about technology and data infrastructure – it is not simply a source of data”

system used by engineers and operations people in the support of their critical operations that could do a lot more than simple Historian technology could.”

Herbert emphasised that the industry wants to use data more broadly across its organisation, and it wants to move to a world where things are less unclear, more predictive, more productive, more cost-effective and more automated.

PI System has evolved significantly over the past five to six years and has proceeded from its origins into something more powerful and more able to underpin modern digital transformation initiatives in oil and gas. To clarify that concept further, Herbert mentioned the PI System benefits including

making the data consistent and meaningful to everyone; data quality and reliability; enabling engineers with the tools they need; and advanced analytics and data science.

Therefore, a “tremendous amount of value” can be realised. Herbert exemplified the success of this technology through talking about customers' value statements. Shell, for example, has realised US\$200+mn of cost savings and operational improvement annually; BP saved more than US\$1million in the first month of a single project; Spirit Energy recorded a 20 per cent lift in production in one asset; and Eni improved asset availability by 2.4 per cent and reduced maintenance costs by 5 per cent. ♦

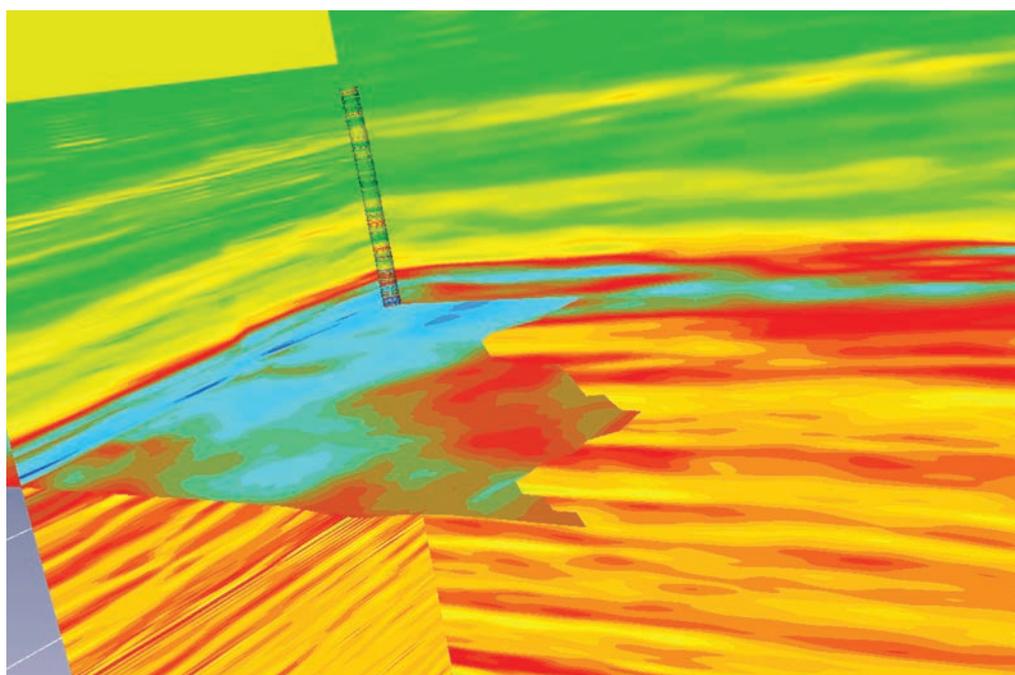
MACHINE LEARNING'S MULTI-SECTOR APPLICATIONS

Companies such as CGG and Olis Robotics are finding new and exciting ways to leverage machine learning technologies in niche sectors of the oil and gas industry, such as reservoir characterisation and remote offshore vehicles (ROVs).

MACHINE LEARNING IS becoming more sophisticated and specialised. It is already being used extensively across oil and gas operations and some of the latest technologies are able to help operators with highly specific tasks in sectors and sub-sectors of the industry.

For example, GeoSoftware, part of CGG's Geoscience division, has announced that machine learning technology in Python ecosystems will be available in upcoming releases of its flagship HampsonRussell and Jason reservoir characterisation solutions. These ecosystems allow users to research and test machine learning workflows for proof-of-concept or commercial projects. Scripts and workflows directly access well, horizon and seismic data for use in machine learning, deep learning, visualisation and numerical analysis. G&G experts and data scientists can use Ecosystem workflows pre-built by CGG or they can build their own new reservoir characterisation workflows using the latest open source machine learning packages, such as Google's TensorFlow.

Kamal al-Yahya, senior vice president, software & smart data solutions, said the latest update will "enable effective research and application of machine learning technologies in reservoir characterisation workflows."



This machine learning application predicts density using a deep neural network, seen here in great detail.

For Olis Robotics, machine learning has found a niche in the ROV controllers sector after the

“ New machine learning technologies can be enabled effectively in reservoir characterisation workflows and with controlling ROVs”

company launched a sales and distribution partnership with Forum Energy Technologies. The technology, aimed at the growing subsea market, is a next-generation controller for piloting ROVs in the offshore energy industry. The controller provides remote and local ROV operation in a configuration that aims to boost task efficiencies to decrease ROV operation costs, with a live 3D workspace created.

The technology has received praise from customers operating subsea vessels in the North Sea and has been tested in the Gulf of Mexico and off the Brazilian coast.

“The Olis Master Controller unlocks vast new opportunities for offshore energy companies to increase efficiencies, reduce human risk and greatly lower their costs,” said Don Pickering, CEO for Olis Robotics.

Kevin Taylor, Forum's vice president for subsea vehicles commented, “The technology provided by Olis Robotics enables Forum to offer improvements in safety, productivity, and reliability to the substantial worldwide fleet of Forum-made ROVs owned by our customers, and to enhance the capability of new vehicles.”

SAFETY AT SEA

ACROSS ALL OPERATIONS

With much of Africa's oil and gas wealth located offshore, marine safety is integral to all successful operations, from crew transport and rig supply, right through to tanker shipping. Martin Clark reports.

ON A DAY-TO-DAY level, industry bodies such as the International Maritime Organisation (IMO) work continuously to improve safety at sea. Amendments to SOLAS (Safety of Life at Sea) regulations last year make mandatory requirements for maintenance, examination, testing and repair of lifeboats and rescue boats, launching appliances and release gear. But safety considerations represent a big challenge for an industry during an era of lower spending, with competitiveness and efficiency high on the boardroom agenda. The mandatory SOLAS rules must be factored into oil and gas shipping and offshore costs, regardless of bottom-line pressures faced by operators.

"Strong cost discipline is key to short- and long-term goals," noted DNV GL, the marine classification society, in its latest oil and gas outlook.

Yet the importance of safety is something that underpins all strands of the energy sector, including marine activities.

What's more, the evolution of technology and other forces shaping the industry promises to throw up more challenges for those tasked with ensuring safety at sea. Again, according to DNV GL, the next decade will see a greater proliferation of autonomous vehicles, while



Across the world, maritime safety standards are being improved with updated mandatory requirements.

energy production and transmission will increasingly become the domain of algorithms rather than people.

"As digital technologies transform multiple industries, the risk picture is changing," it notes in a report. "Current assurance methods focus on

physical and business process risks, but there is an urgent need for industries to properly identify, understand and manage emerging digital risks."

One general trend that could help all industry players balance safety with cost is an increased shift to standardisation.

Stian Saltnes Gurrik, joint industry project manager, materials technology at DNV GL, says that the subsea sector is "willing and prepared to standardise requirements in order to safely reduce cost while ensuring consistent high quality."

It marks a step towards a more united, sustainable, and cost-effective sector, which could be replicated elsewhere along the oil and gas chain.

Security is another challenge that throws up further costs, from defending maritime assets from hijacks, through to attacks on submarine telecoms cabling.

That's especially an issue in the restive Niger Delta region, West Africa's busiest oil-producing zone. Nigeria's Hadnuvo Marine is acquiring a new 35-metre Sentinel vessel for use in the Gulf of Guinea's oil and gas sector, which is purpose-built for tough conditions. The vessel, MV Khajan, built by Cape Town-based Nautic Africa, can be used for multiple assignments, including crew transport, fire-fighting supply, patrols and rapid response, and offers extra protection against gunfire.

It illustrates not only the myriad challenges facing offshore operators, but also the creativity of solution-providers and the necessity to collaborate – safety and security, like all parts of the oil and gas sector, hinges on teamwork. ♦



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SNAKEBITES: MANAGING THE RISKS ON AFRICAN OPERATIONS

For projects in Africa, the oil and gas industry needs to consider the risks of workers and members of local communities being bitten by snakes. Remote Medical International and the Asclepius Snakebite Foundation have developed proven management and response strategies.

OIL COMPANIES SHOULD be asking if the risk of snakebites at the project stage is a concern and, if so, what should be done?

Prevention of snakebites is the first goal, such as working proactively with snake handlers, safety and security teams to try to remove the threat of snakebites from camps and work areas. However, this cannot be 100 per cent assured and snakebites do occur. When this happens the circumstances are reviewed, and safeguarding procedures updated if appropriate.

Although medevacs may appear to be a good option, there are many downsides. First, a medevac is costly and places stress on the patient. Second, time really is of the essence when it comes to treating a snakebite. Delaying treatment means increased damage to surrounding tissue, resulting in greater risk of permanent disability or a fatal outcome. The progression of necrosis can be prevented or stopped by antivenom administration, but once the damage has been done it cannot be reversed. And once evacuated, does the medical centre the patient is transferred to have the correct antivenom and expertise? There is still the need for a complete care strategy.

In Kenya, snakebites claim thousands of lives every year. For the oil industry, the threat of

snakebites in this area is probably one of the top three risks to workers. To support its local strategy in dealing with snakebites, Tullow Oil has worked alongside Remote Medical International with the support of the Asclepius Snakebite Foundation to put a robust response strategy in place in Kenya. This includes donations of medicines, and training of staff in local hospitals to systematically assess, diagnose, and treat patients with snake envenomation. The definitive treatment capability that has been developed produces better patient outcomes for anyone who is bitten in the area, and reports are already indicating a reduction in snakebite deaths and disabilities and an increase in

patients seeking treatment.

Andy Kimmell, operations director, global coordination & security at Remote Medical International said, "At a remote oil and gas camp in Kenya, a man sleeping in an eight-man dormitory awoke with breathing difficulties and a pain in his hand. The on-site medics quickly identified it as a cobra envenomation and acted."

He added, "Of course, a top priority was to administer the correct antivenom and treat the patient. The neurotoxic bite was attacking the respiratory system and quick action was needed to save the man's life. The other priority was to get the other seven men out of the tent and to safety until the snake had been found. Snake handlers and

security teams worked quickly to find the snake, humanely capture it and release it.

A robust strategy to deal with an envenomation is needed to reduce mortality rates and the chances of permanent disability in the oil industry. This means working with experts and producing a complete plan to reduce the risk of snake encounters and procedures to swiftly and effectively treat snakebites at the point of injury. Medevacs, although sometimes necessary, should not be the primary approach. Through education and outreach, the industry can deliver vital support to communities and workers to help make lives safer and better in regions where they operate. ♦



The eastern vine snake is found in Kenya, Mozambique, Somalia, Tanzania, Zambia and Zimbabwe.

UNDERSTANDING AFRICA'S OIL AND GAS POTENTIAL FROM ABOVE

Airborne geophysical surveys are a means of covering a wide area to provide critical insight into potential resources underground, whether the project is onshore or offshore.

Martin Clark reports.

AIRBORNE GEOPHYSICAL SURVEYS are widely used in Africa and elsewhere across the extractive industries, from mining to oil and gas. Essentially, the data can aid explorers in the search for hydrocarbons and other resources and help to identify where to concentrate their search.

The information is useful for officials in host countries too and national petroleum departments.

Sierra Leone kicked off an airborne survey last year to identify its minerals deposits in order to fuel interest in the sector.

While airborne surveys have long been a feature of the African upstream map, the technology deployed has updated massively in recent times.

Seismic specialist TGS is working with AustinBridgeport to acquire the world's highest resolution gravity imagery, eFTG (enhanced Full Tensor Gravity Gradiometry), within Egypt. It utilises technology from US aviation giant Lockheed Martin. The project commenced with a regional airborne eFTG multi-client survey, together with magnetic and Lidar data, to cover both onshore and offshore Egypt.

Dr Mark Davies, AustinBridgeport chief executive, called it a groundbreaking project: "Lockheed Martin's enhanced Full Tensor Gravity Gradiometer



The area north of historic Dongola in Sudan has been assessed via airborne surveys.

Image Credit: Hans Birger Nilsson/Flickr

– the eFTG – is the world's highest resolution system. No other system comes close and I cannot think of any better way to fast-track the exploration of such a vast frontier area."

Indeed, the airborne survey has become an industry in itself in recent decades on the back of Africa's high-growth natural resources industries, with multiple players offering bespoke technology, expertise and aircraft.

South Africa's Xcalibur Airborne Geophysics, which operates across large swathes of the continent, offers a diverse range of services such as fixed- and rotary-wing airborne gradient magnetic and

radiometric, EM (electromagnetic) and gravity surveys.

Its recent projects include regional mapping and a TEM survey for diamonds in Angola, though the company has operated in the majority of African countries.

But while the industry has typically turned to manned aircraft, there is a shift to drones as an alternative.

Pioneer Aerial Surveys Ltd. is a provider of UAV (unmanned aerial vehicles) remote sensing and survey solutions. It says drones are increasingly capable of carrying out more complex assignments and carrying ever more sophisticated kit from

magnetometers to gamma-ray spectrometers.

While geological and geophysical surveys make up the majority of its work, it is active in other niches from solar panel inspection to hyperspectral mapping. In 2018, it landed a contract with Axiom Group for a high-resolution UAV-MAG survey in a remote region of northern Sudan.

The project, which includes high resolution UAV orthophotography and lithology-structure mapping, is in support of a gold exploration venture by Sucam Mining Corp, 66km northwest of the city of Dongola. ♦

BOOSTING EFFICIENCY AND PROFITABILITY WITH CORROSION MONITORING

The global corrosion monitoring solutions market encompasses intrusive and non-intrusive products. Research and consulting firm Frost & Sullivan highlight some of the worldwide trends in this market.

CORROSION MONITORING PLAYS a vital role in a number of industries, assisting in raising productivity and decreasing downtime. More than 80 per cent of the total corrosion monitoring market revenue is derived from the oil and gas industry. In areas where investment in oil and gas infrastructure has decreased significantly, there is an opportunity for corrosion monitoring solutions companies.

Within oil and gas, downstream oil and gas is the largest segment, followed by the upstream and midstream segments. Midstream infrastructure such as pipelines both onshore and offshore; pipelines that connect oil wells with the gathering station or the tank battery, and transmission lines connecting the gathering stations to the refineries and distribution lines, are monitored on a continuous basis.

Monitoring is critical in downstream infrastructure. In the downstream segment, non-intrusive corrosion monitoring is being used for process control and to increase profitability of operations. The feedstock used in refineries and petrochemical complexes can be extremely corrosive in nature. The cheaper the cost of feedstock, the higher is its corrosivity. Non-intrusive corrosion monitoring can be used



Monitoring corrosion can prevent major maintenance issues and save money.

to assess the corrosion of a pipe for a particular grade of feedstock. As a result, refineries can run a lower grade of feedstock if their pipes can handle corrosion and, thus, can increase profit margins significantly. In the upstream segment there are applications for corrosion monitoring in risers, FPSOs, subsea pipelines, and offshore platforms.

Globally, the revenue for intrusive and non-intrusive corrosion monitoring market is estimated at 60:40. Due to the inherent disadvantages related to safety in intrusive corrosion monitoring, a clear shift to non-intrusive corrosion monitoring techniques has been

witnessed, and the trend is expected to reverse.

Driving factors for corrosion monitoring include:

- ◆ Maximising the profitability of existing assets is expected to increase the demand for corrosion monitoring solutions
- ◆ The need for high efficiency and longevity for corrosion-related assets has triggered the need for continuous monitoring rather than the traditional testing methods
- ◆ Increasing awareness about corrosion monitoring driven by high-profile corrosion-related asset failures boosts demand for new solutions

- ◆ Use of corrosion monitoring data to not only assess corrosion progression but also control processes enhances the addressable market.

Success factors include:

- ◆ Investment in new infrastructure projects, especially in the oil and gas industry, has taken a back seat globally, so end users are maximising profitability of existing assets, and corrosion monitoring companies can grow.
- ◆ Clear shift from intrusive corrosion monitoring to non-intrusive corrosion monitoring solutions, so solution providers should focus more on non-intrusive solutions.
- ◆ Progression from periodic testing to continuous monitoring, which is taking place in the oil and gas industry and will also be witnessed in other industries, such as power generation, pulp and paper, and mining. Solution providers should focus more on these industries.
- ◆ Vendors should have a strong presence to provide support on new techniques.
- ◆ Corrosion monitoring solution providers must include value-added services as part of their offerings and utilise their expertise to solve the day-to-day problems of customers. ◆

MEETING RECRUITMENT CHALLENGES DURING MERGERS AND ACQUISITIONS

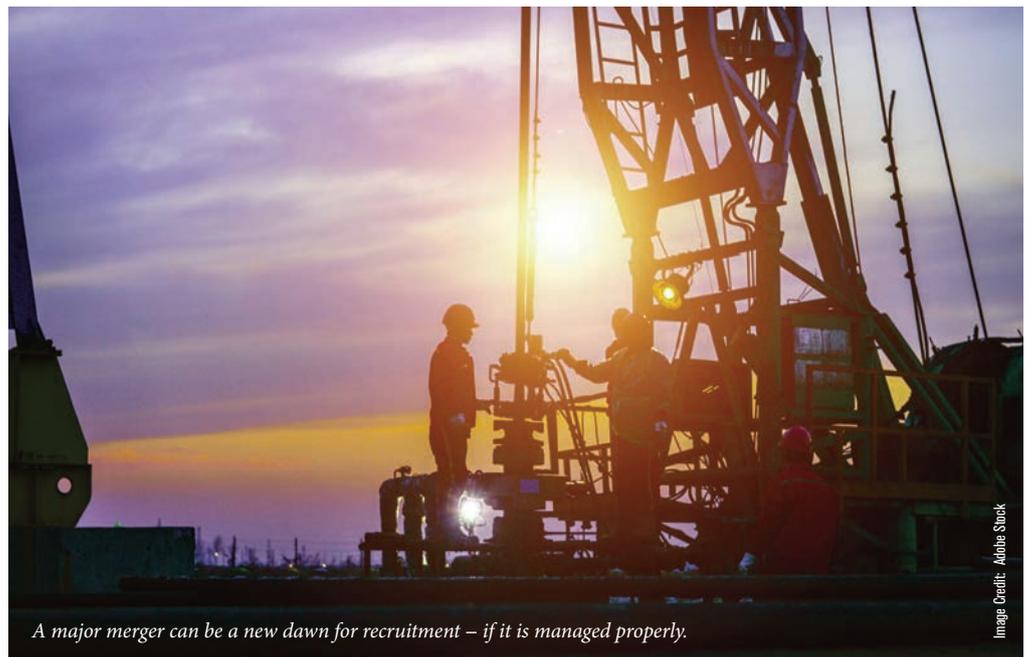
Mergers and acquisitions are conducted with balance sheets and bottom lines in mind but it is important to ensure workforce challenges do not spring up as a result of major corporate moves, as the possible merger of Subsea 7 and Saipem demonstrates.

AT THE END of 2019, the oil and gas industry was abuzz with the news that UK's Subsea 7 and Italy's Saipem may be merging. At the time of going to press, the merger had not yet been confirmed but it does shine a light on the importance of ensuring such major corporate moves do not create recruitment issues. When the story of a possible merger broke last November, Samuel Knight International took the opportunity to make the point that talent attraction and retention should be made a priority during big moves.

The merger, if it takes place, of these two companies could rank as one of the European oil services industry's biggest-ever deals and result in more than US\$12.4bn in revenue, however, the challenge of sourcing the right skills remains.

Commenting on the reports

“ It is no secret that skills shortages are adding to the strain and companies must ensure they have the capacity to attract workers to the industry”



A major merger can be a new dawn for recruitment – if it is managed properly.

Image Credit: Ardihe Struck

of the potential oil and gas contractor merger and its possible impact on human resources, George Wallis, Business Development Manager at Samuel Knight International, said, “Saipem and Subsea 7 have held talks about a merger in previous years, though they failed to reach an agreement. If this deal goes through, the joint force will be the fourth-largest oilfield service firm and will create an even stronger presence within the SURF segment. This, of course, is fantastic news for the sector, but with the subsea industry expecting a rise in new projects, workforces will be stretched even further. It's no secret that skills

shortages are adding strain, and in order for this to not be exacerbated further, the two companies must ensure they have the capacity and ability to attract workers in this talent-strapped industry.”

Mr Wallis went on to offer advice to the two companies, which could certainly be applied to other big companies looking to join forces.

“The two oil and gas contractor giants must invest time and money to create sustainable talent pools, ready for the new challenges ahead,” he said. “Both Saipem and Subsea 7 have stated goals of decarbonisation in order to become

greener energy service companies, and with acute skills gaps already affecting the sector, sourcing the workers needed to achieve these goals must be planned strategically.

“While solving the sector's skills shortage will not happen overnight, there are actions that can be taken now, such as recruiting from wider talent pools and enhancing employer branding to attract a more diverse workforce. By acting strategically, and making more noise about the exciting opportunities available, we will be able to overcome skill gaps and create sustainable workforces,” he concluded. ♦

EOR AND FLUID END ASSEMBLY: A GLOBAL PERSPECTIVE

A report released by Transparency Market Research analyses the state of the global enhanced oil recovery (EOR) sector and the projects around the world that will drive further growth and investment in the fluid end assembly market.

THE GLOBAL FLUID end assembly market was valued at around US\$9.8bn in 2018 and is anticipated to expand at a CAGR of around 4 per cent during the forecast period. Based on type, the triplex fluid end segment held a dominant share of the fluid end assembly market in 2018, primarily due to its high quality and low price. In terms of material, the stainless steel segment accounted for a major share of the fluid end assembly market in 2018. Demand for stainless steel fluid end assembly is high due to its excellent quality and long life. Based on application, the onshore segment constituted a significant share of the fluid end assembly market in 2018, owing to the presence of a large number of wells and lower cost of investment compared to offshore wells. The fluid end assembly market in North America is likely to expand at a substantial pace during the forecast period, owing to significant investments in exploration and production activities in the oil and gas industry in the region.

Of late, several oil and gas discoveries have been made across the globe. Furthermore, shale discoveries are rising at a promising rate. For instance, Russia discovered nearly 1.5 billion barrels of oil equivalent



Image Credit: Adobe Stock

Drilling with fluid end assembly enhances EOR and provides opportunities.

(Bboe), with new discoveries on the peninsula shelf in the Kara Sea. In Guyana, ExxonMobil made 14 discoveries during the first quarter of 2019, while Tullow Oil PLC also announced

“ Several new oil and gas discoveries, providing lucrative opportunities to service companies which use fluid end assembly for drilling”

two new discoveries. These discoveries of new oil and gas reserves provide lucrative opportunities to oil and gas service companies, which use fluid end assembly for drilling. In November 2019, Tullow Oil PLC and its licensed partner Orinduick announced that they had started assessing commercial viability of two offshore Guyana discoveries after lab results indicated that the oil recovered was heavy crude oil with high sulfur content. Thus, discovery of new oil and gas reserves across the world is fuelling the expansion of the fluid end assembly market.

In August 2019, Halliburton Company bagged nine

conditional contracts for drilling and completion services for Sangomar field development in Senegal from Woodside Energy (Senegal). Moreover, in July 2019, Halliburton and Kuwait Oil Company (KOC) announced that they had signed an Integrated Offshore Drilling Services contract for six high-pressure high-temperature (HPHT) exploration wells in the Arabian Gulf. The fluid end assembly market is led by multinational players operating across the globe. Prominent players in the fluid end assembly market are Halliburton, The Weir Group, Forum Energy Technologies, Gardner Denver, EnTrans International and Alco Group. 🔥

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AFRICAN RIG COUNT

COUNTRY	September 2019	October 2019	November 2019	December 2019
ANGOLA	4	2	3	5
CAMEROON	2	2	2	2
CHAD	7	7	7	7
CONGO	2	2	2	2
CÔTE D'IVOIRE	0	0	0	0
EQUATORIAL GUINEA	1	1	1	1
GABON	8	8	9	9
GHANA	1	1	2	2
KENYA	7	7	5	5
LIBYA	16	16	16	16
MAURITANIA	0	0	1	1
MOROCCO	1	1	1	1
MOZAMBIQUE	0	0	1	1
NIGERIA	17	18	20	17
SENEGAL	0	0	0	0
TUNISIA	2	2	2	2

Source: Baker Hughes

Isolation gasket features tight seal and easy installation

GARLOCK PIPELINE TECHNOLOGIES (GPT) has unveiled EVOLUTION, a fully coated isolation gasket that features easier installation, tight sealing, high-temperature operation, no permeation, hydrotesting isolation, fire-safety and chemical-resistance.

The EVOLUTION gasket features the highest tightness parameters for any product available in the market today.

With demands placed on the oil and gas industry to improve leakage rates and meet environmental targets, the increased levels of tightness achieved will exceed requirements and result in greater joint integrity.

Featuring a thinner, 1/8"

design, EVOLUTION minimises the difficulties often encountered when attempting to install thicker isolating gaskets.

The full-coating encapsulation allows the gasket to be hydrotested and left in the pipeline with the same isolation properties as before it was tested.

EVOLUTION's coating (a GPT proprietary material) is extremely abrasion- and impact-resistant, while providing chemical resistance to hydrogen sulphide, steam, carbon monoxide, carbon dioxide, and other often-damaging chemicals and substances commonly found in oil and gas pipelines.

This fully encapsulated coating also prevents the need for

expensive exotic cores, as it eliminates contact to exposed metal.

"As its name implies, EVOLUTION is the next step in gasket technology and is poised to eliminate a number of issues that plagued gaskets in previous iterations," said Tim Hurley, GPT senior global product manager.

"EVOLUTION was designed to take the best available technology for pipeline isolation and incorporate all of these benefits into one comprehensive product."

www.gptindustries.com



The gasket features tightness parameters.

Image Credit: Garlock Pipeline Technologies

ENEA and Eni join forces in future energy project

ENEA AND ENI will work together in a strategic alliance on a project, worth more than 600mn euros. It will focus on the energy of the future, sustainable, safe and unlimited, and it involves the establishment of a scientific and technological centre for fusion DTT (Divertor Tokamak Test) in ENEA's Research Centre in Rome by DDT Scarl, a joint venture owned 25 per cent by Eni, 74 per cent by ENEA and 1 per cent by Consorzio CREATE.

The project will have an impact of around 2bn euros on the Italian GDP and will create 1,500 new jobs, among which 500 will be scientists and technical specialists.

The Divertor Tokamak Test will be built over seven years and will see the participation of the European Union, the Consorzio CREATE, and the European Investment Bank (with a record funding of 250mn euros provided by the European Fund for Strategic Investments, a pillar of the Juncker Plan for investments), the European Consortium EUROfusion (with 60 million euros under the Horizon 2020 funds), the Minister of Economic Development and the Ministry of University and Research (with about 80mn euros), Lazio Region (with 25mn euros as well as the expenses of connection to the national electricity grid) and other 30mn euros given by international partners.

Eni's CEO Claudio Descalzi said the project will leverage the company's "know-how of the industry, as well as our skills on the management and development of large projects."

DCT announces strategic growth plans to grow across Africa following Nigeria success

UK-BASED OIL AND gas technology development company, Deep Casing Tools (DCT), has announced the appointment of two agents as part of its strategic growth plans in Africa.

According to The Gas Exporting Countries Forum (GECF), Africa will more than double its gas production by 2040, providing 9.2 per cent of the world's output, or more than 505 billion cubic metres. This presents a huge growth opportunity for businesses which support operators to make operations more efficient.

Partnering with these Africa-based agents will allow DCT to rapidly respond to growing customer demand in the region by deploying its suite of well construction and completion



DCT hopes to grow its African customer base.

tools quickly and safely, whilst delivering a high level of on-the-ground service. The partnerships highlight a growing demand for oil and gas well services and innovation in Africa.

DCT recently deployed the Turborunner™ on a project with Shell Nigeria Exploration and Production (SNEPCO), allowing the operator to drill a new

horizontal 2D well and develop the BNW690 reservoir within the Bonga North West field, part of the Bonga Deep Water Project, which is located south west of the Niger Delta. The technology delivered significant time and potential re-run savings, which included a time reduction of 75 per cent and provided an additional ROI of 5 per cent.

Wide range of pioneering exploration solutions showcased at Vancouver event

NEW TECHNOLOGIES AND innovations in exploration have been examined by international experts attending the annual Xploration Technology Symposium in Vancouver, Canada, held in January.

International consulting practice SRK had principal structural geologist Wayne Barnett presenting on virtual-

mixed reality, where he discussed augmented visual powers to automatically measure surface orientations and how this is changing best practices in data collection and analysis.

Professor Bern Klein of the University of British Columbia discussed industry research to optimise value and ensure worker safety in deep underground mass

mining operations.

The use of machine learning for mineral exploration in greenfield areas was discussed by GoldSpot Discoveries Corp chief operating officer Vincent Dubois during the session on artificial intelligence.

The exploration case studies included Rogue Geoscience president Chris Gallagher who has been instrumental in developing several exploration technologies and geological data management systems used in the industry today.

Nick Payne, global product manager structural geology at IMDEX, discussed new technologies, IMDEX Corevibe and IMDEX Xtracta – which offer substantial improvements in safety and productivity.



Delegates learned about a slew of exploration innovations.

Belzona develops corrosion protection solution with thermal insulation barrier

BELZONA POLYMERIC HAS developed an innovative and multifunctional two-component, polymeric, solvent-free system - Belzona 5871. Industries and facilities around the world face challenges linked to the maintenance of pipework, tanks, and vessels. Damage and deterioration of pipes, valves and fittings are a widespread problem and occur due to corrosion, erosion, thermal cycling, and chemical attack. In order to save energy costs and reduce waste, companies are recognising the importance of insulating their equipment to prevent heat loss and increase efficiency, however, this creates another issue, corrosion under insulation (CUI). CUI is a major issue which occurs on equipment operating in low, ambient, and high-temperature environments.

The role of insulation for heat conservation is crucial, but also



Corrosion protection comes to the fore with Belzona 5871.

shielding personnel from burns when working with hot machinery and equipment is extremely important as metallic surfaces at $\geq 60^{\circ}\text{C}$ can lead to hot burns when touched.

This system provides a thermal insulation barrier with corrosion protection and “cool-to-touch” properties. Designed to be applied onto metal pipework, ducting, tank/vessel externals, and other industrial equipment,

Belzona 5871 protects against contact-burn injuries, corrosion under insulation, condensation, and icing. This all results in improved safety, durability and efficiency. Upon application, the product forms a lightweight, high-build closed-cell foam thanks to its epoxy technology and expands up to three times its applied thickness.

www.belzona.com

DNV GL launches standard for safer pipeline installation with horizontal drilling

A NEW STANDARD for site investigation, engineering, planning and execution of pipeline installation through horizontal directional drilling (HDD), has been published by DNV GL.

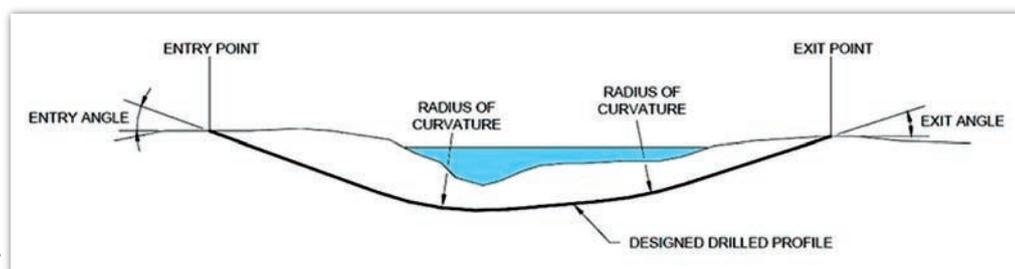
The standard, DNVGL-ST-F121, was created through a joint industry project (JIP) and provides a series of minimum

requirements and best practice for all phases, from site investigation, engineering and planning to execution of pipeline installation to reduce the risk associated to HDD crossings.

“DNV GL brought together a multi-disciplinary group of experts that resulted in a new standard that has established clear parameters, limits and

criteria for essential issues related to HDD projects,” said Frank Ketelaars, regional manager, Americas, DNV GL – Oil & Gas. “We are confident that this standard will bring long-term benefit to HDD operations, reducing risk and improving quality,”

www.oilgas.standards.dnvgl.com/



Speedcast to boost offshore bandwidth

ST ENGINEERING IDIRECT ANNOUNCED that Speedcast, a provider of remote communication and IT solutions, will deploy the Newtec Dialog platform to provide worldwide satellite broadband services for its customers. The deployment will enable Speedcast to respond to the exponential demand for high-speed connectivity on board cruise ships and may be used for other vertical market segments with increasing bandwidth requirements, such as yachting, oil and gas and the enterprise market. This builds upon the long-term partnership that has been forged between ST Engineering iDirect and Speedcast, supporting mission-critical communications in the world's most remote regions.

Dialog can be used as a single and multi-service VSAT platform that allows operators to build and adapt superior infrastructure and satellite networking according to their business or missions. It gives operators the power to offer a variety of mobile and fixed services on a single platform, all of which can be delivered to customers operating remotely.

“We were looking for a technology platform that could meet our current and future bandwidth challenges but also that was versatile enough to be used across other market segments where we were seeing similar demands,” said PJ Beylier, CEO, Speedcast. “The Dialog platform, with its high throughput and efficiency capabilities, allows us to deploy high-end services and is ultimately a natural extension of our existing Very Small Aperture Terminal (VSAT) network.”

Forum Energy Technology upgrades UK testing facility

FORUM ENERGY TECHNOLOGIES has completed a three-month upgrade to its hyperbaric testing facility, which will result in an operational time saving to clients of more than 35 per cent. The pressure test tank provides a facility for the critical testing of subsea equipment. Improvements include enhanced pumps, which can reduce tank filling by 45 minutes. The tank's door has been fitted with the latest technology allowing it to be opened and closed 1.5 hours quicker than before, creating significant efficiencies. The tank is rated to 241bar and measures 2.4m diameter x 9.7m length. An HMG300 Hydac system captures data, including pressure,



Image Credit: Forum Energy Technologies

The testing facility at its UK location in Yorkshire.

temperature and flow.

Kevin Taylor, vice president of subsea vehicles at Forum Energy Technologies said, "Forum's UK-

based hyperbaric test tank has been a vital asset for decades and has supported major oil and gas operators, subsea service

providers, international navies and telecommunication companies from around the world. As E&P activity ramps back up in the North Sea and new research and development projects are sanctioned, we are seeing increased demand for our hyperbaric test tank. The recent upgrades, coupled with a larger engineering team, means that testing can now be more tailored to customer requirements, providing bespoke and faster service. The investment also underlines our commitment to our clients by providing a solution to address their challenges and exceed their expectations."

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MAKING GREAT PROGRESS IN EQUATORIAL GUINEA

Almost a year after *Oil Review Africa* first caught up with Elite Construcciones, Marisol Ovono Nchama, the company's managing director, provides an update on the latest activities in the emerging market of Equatorial Guinea.

We last caught up with Elite Construcciones at the start of 2019. What has the company achieved since then?

Since we last talked, Elite Construcciones has been heavily involved in the Noble/MEGPL gas backfill project, including carrying out laser surveys, geotechnical drilling and site investigations, soil testing, site preparation and foundation works for the incoming pipeline.

This is a good project for Noble Energy, Marathon Equatorial Guinea and the Ministry of Mines of Hydrocarbons and Elite is very proud to be a part of it.

What are the prospects in the Equatorial Guinea market looking like at the moment?

We feel that 2020 is going to be a positive year for Equatorial Guinea. The Ministry of Mines and Hydrocarbons has a good, positive initiative with various new projects on the table, including the gas hub. As a national company, Elite is hoping to be involved heavily in this and other new projects.

Why is Equatorial Guinea a good place to do business?

Equatorial Guinea, like all the petroleum reliant countries, suffered badly when the oil prices crashed. However, we have proved ourselves to be fighters – Equatorial Guinea is back with a



Marisol Ovono Nchama is optimistic about Equatorial Guinea's hydrocarbons industry in 2020.

“ We have proved ourselves to be fighters – Equatorial Guinea is back with a goal, and that goal is to succeed”

goal, and that goal is to succeed. Countries and companies that want to be involved in this ambitious Equatorial Guinea need to get involved before it's too late.

Tell us about your corporate social responsibility and local content commitments.

As a national company, we are heavily involved in social responsibility and reinvesting in Equatorial Guinea. It is very important that all companies remember that we all have a commitment to help Equatorial Guinea with new social programmes.

These programmes do not always require financial assistance training and education are just as much a social requirement.

As for local content, Elite is fully committed. We employ more than 500 national staff, but it is not just employing the staff. It is about looking after them and teaching them how to excel and be part of a family, working together and helping each other.

As a company, the most important single asset is our staff. Without them, there is no Elite – we are committed to local content.

What plans do you have for 2020 and beyond?

To keep giving the service and commitment we have always given to our clients, without whom we would not be here. 

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