

Oil Review

Oil · Gas · Petrochemicals

Africa

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Senegal and Mauritania Africa's new players

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2-5 JULY 2018
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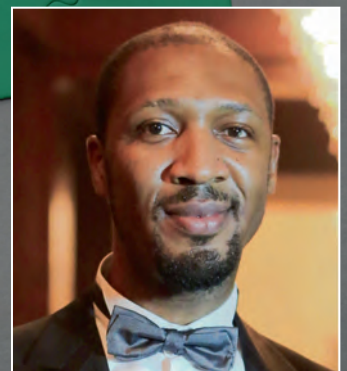


Growth for gas in Tanzania and Côte d'Ivoire

New offshore licensing rounds for Sierra Leone

How to be a leader in employee training and corporate social responsibility

Asset integrity management, floating production, leak detection on pipelines, multiphase pump installation case study



Ohioze Unuigbo, Country Chief
Executive, Bureau Veritas Nigeria
(p34)



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Senegal and Mauritania are entering a new era of cooperation. See page 20.

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EDITOR'S NOTE

There is certainly a more optimistic mood across the oil and gas industry in Africa and beyond with the oil price rising once again and passing the US\$70 mark, albeit with some caution. When *Oil Review Africa* interviewed HE Gabriel Mbaga Obiang Lima, Equatorial Guinea's minister for mines and hydrocarbons, he told us while the oil price going above US\$70 is good news for industry stability, if it climbs above US\$100, "we are back in the danger zone".

Here's hoping that we can avoid the "danger zone" this time around and, with lessons learnt from the downturn, including how to run leaner, more cost-effective operations, there are plenty of reasons for hydrocarbons producers across the continent to be more upbeat than perhaps they have been in recent years.

The buoyant mood is certainly good news for Senegal and Mauritania, two West African countries hoping to benefit from massive offshore discoveries. Find out more on page 20.

Georgia Lewis
Managing Editor

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19-22 Africa Energy Forum
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www.africa-energy-forum.com

20-21 5th East Africa Oil & Gas Summit & Exhibition
Nairobi
www.eaogs.com

20-22 Upstream West Africa
Dakar
www.upstreamwestafrica.com

JULY

2-5 Nigeria Oil & Gas Conference & Exhibition
Abuja
www.cwcnog.com

OCTOBER

9-11 ECOWAS Mining & Petroleum Forum & Exhibition
Abidjan
www.ametrade.com/ecomof

NOVEMBER

5-9 Africa Oil Week
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www.africa-oilweek.com

12-15 ADIPEC
Abu Dhabi
www.adipec.com

21-22 Ghana Summit
Accra
www.cwcghana.com

27-29 Valve World Expo
Dusseldorf
www.valveworldexpo.com

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

Upstream West Africa draws decision-makers to Dakar

ORGANISERS OF UPSTREAM West Africa are promising a move away from traditional trade shows and exhibitions with a closed-door event featuring leading decision-makers in the African upstream sector.

The closed-door meeting will take place on the first day of the event and it will only be open to government and independent oil companies, national oil companies and ministry representatives.

On the second day of the Dakar event, a keynote panel discussion will kick off proceedings with a focus on working in remote and challenging regions and complying with environmental regulations.

Gas will be a strong focus, particularly in light of major gas discoveries off the coast of Senegal and Mauritania with an update from BP on the Tortue project and the challenges surrounding gas monetisation.



Image Credit: Bob Adams/Flickr

The offshore hydrocarbons industry is set to take off in Senegal and Mauritania, thanks to a massive discovery.

Ghana, which is now an established hydrocarbons market, will be in the spotlight with a case study presentation on a gas FPSO led by Jahn Atle Hogberg, senior vice president. Yinson Production.

Liberia, which currently does not have any significant experience in petroleum operations or strong ancillary

businesses to support the hydrocarbons industry, will be another focus on the second day. A session on how Liberian companies can meet these challenges and discover growth opportunities, as well as boosting local content, will be held with one-to-one meetings on the agenda. The session will be led by Rufus Tarbue, CEO, NOCAL.

Technology is a permanent fixture on African oil and gas agendas and Upstream West Africa is no exception, with sessions on deepwater and subsea production challenges and how the digital oilfield is transforming how the oil and gas industry does business.

Technology needs to work hand-in-hand with geology and to that end, there will be sessions with a geological focus. These include a session on critical geological insights for enhancing exploration programmes, presented by George Liszicasz, chairman and CEO, NXT Energy Services, and a data-driven session on exploration and production data management in Côte d'Ivoire, led by Bertrand Zahoui, geologist and exploration and production data bank manager, Petroci.

Upstream West Africa will be held from 20-22 June in Dakar, Senegal. www.upstreamwestafrica.com



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Comoros Islands could provide new opportunity for oil and gas logistics

THE COMOROS ISLANDS, located in the Indian Ocean between the Mozambique coastline and Madagascar, could be among the new "elephant" oil and gas discoveries for Africa.

Speaking at last month's Africa E&P Summit in London, Alexander Mollinger, chief operating officer, Discover Exploration, said that the combination of the islands' location in the Mozambique Channel and 16,000sq km of 2D seismic data for a drill-ready field with up to 10.5bn boe of gas could transform the country's economy. As well as the strong gas case, the data shows a potential oil find of 7bn barrels and 1.1 tcf of associated gas. Made up of three islands and with a population of just 800,000, a major gas discovery and



Image Credit: alikomor.com/Wikimedia Commons

The Comoros Islands could be a new leader in offshore and shipping.

subsequent monetisation have the potential to dramatically increase the Comoros Islands' GDP from US\$660mn.

Mr Mollinger explained that the Mozambique Channel was a busy shipping route, before the construction of the Suez Canal shortened many routes by

thousands of miles. However, geopolitical changes are making the Mozambique Channel an attractive shipping route again, avoiding chokepoints such as Yemeni and Iranian waters, and making it suitable for shipping East African gas to Asian markets.

South Sudan minister calls for oil investors to make long-term commitments

HE EZEKIEL LOL Gatkuoth, South Sudan's petroleum minister, reassured delegates at the Africa Oil & Power Investment Forum, that the country's oil facilities are secure and investors should not be

deterred. In a candid address, Minister Gatkuoth said that while South Sudan has experienced unrest as it establishes itself as a nation seven years after gaining independence, the government keeps the country's oil

installations secure and this is separate to the political situation.

"Politics? Leave it to the politicians," he told delegates. "When you come to South Sudan, you need to be a pure company that doesn't have a hidden agenda."

CNPC, the Chinese state-owned petroleum company and a major investor in South Sudan was cited by Minister Gatkuoth as a good example: "CNPC [is in South Sudan] purely to do business ... They don't ask: 'How is the political situation?' or 'When we are going to have an agreement with the rebels?'"

His message to potential investors is: "You'd better be with me in my difficult times so I can be with you in your good times ... we can fix the country together."



Image Credit: Rikugijeta Bonestor/Wikimedia Commons

It is hoped that investment in South Sudan will boost infrastructure.

Gas megahub for Equatorial Guinea

HE GABRIEL MBAGA Obiang Lima, Equatorial Guinea's minister for mines and hydrocarbons, announced plans to develop a "gas megahub" at the Africa Oil & Power Investor Forum, which was held last month in London.

The Bioko Island project comes with a tight timetable to be completed "by 2020 or even before", according to the minister.

"This will prove to the world that Equatorial Guinea doesn't just talk," he told delegates. The project will be led by the Ministry of Mines and Hydrocarbons and a gas supply agreement has been signed by the ministry and Noble Energy, which operates the Aseng and Alen fields.

Gas will be supplied to the Punta Europa gas complex, incorporating the AMPCO methanol plant, Malabo power station and Equatorial Guinea LNG plant. This will be combined with subsea pipelines to connect Aseng, Aleng and Alba fields.

In an interview with *Oil Review Africa* at the Africa E&P Summit, Minister Obiang Lima said that gas production is set to overtake oil in Equatorial Guinea and the megahub project demonstrates the country's commitment to gas in the west African region.

"There is a lot of gas in the neighbourhood and we will have the perfect infrastructure to receive gas and for drilling for more gas," he said. "The incentive is there to make gas more important than oil."

The minister said the project will be completed in three phases and existing infrastructure means that it is "already 25 to 30 per cent ready to go."

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Apex International Energy awards contracts to progress exploration in Egypt

HOUSTON-BASED APEX INTERNATIONAL Energy, the Egypt-focused oil and gas exploration company, has awarded a contract to acquire 1,000 sq km of 3D seismic data in its Southeast Meleiha Concession to BGP International Egypt, LLC. Apex was awarded two concession agreements consisting of 1.7mn acres encompassing the West Badr el Din (4,180 sq km) and South East Meleiha (2,535 sq km) concessions, located in the Abu Gharadig Basin in Egypt's Western Desert, as part of the Egyptian General Petroleum Corporation (EGPC) 2016 bid round.

The company has also made tender awards to Weir, Vallourec Oil and Gas France, Soconord SA and Tenaris Global Services SA



Apex's two concession agreements are located in Egypt's Western Desert.

for the purchase of wellheads, well casing and tubing for the upcoming drilling programme. This work is part of the bid commitment Apex made to invest around US\$27.4mn during the first exploration phase to perform detailed geological studies, acquire and process 3D seismic

and drill six exploratory wells.

"At Southeast Meleiha Concession we will commence 3D seismic acquisition operations in Q4 2018. We expect to begin drilling the first of six exploration wells before year end," said Roger Plank, founder and CEO of Apex international.

Sonatrach to strengthen focus on petrochemicals

SONATRACH, ALGERIA'S STATE-OWNED oil and gas company, is looking to sharpen its focus on petrochemicals. In an interview with Oxford Business Group, its CEO Abdelmoumen Ould Kaddour said, "Petrochemicals will be the most important development sector for Sonatrach in the next century."

The move is designed

to reduce the country's dependence on imports of refined products, which amounted to US\$2bn in 2017, according to a Reuters report.

In support of this objective, Sonatrach signed an agreement with Total in May to launch the engineering studies for a US\$1.4mn petrochemical project in Arzew, western Algeria. The

facility will transform propane into polypropylene, a plastic for which demand is growing strongly, prioritising the local and Mediterranean market. It will have an output capacity of 550,000 tons per year.

Sonatrach is also planning to buy ExxonMobil's 175,000 barrel per day (bpd) Augusta refinery and three oil terminals in Sicily, and other recent deals include an agreement to exchange crude for refined products with oil trader Vitol and a deal with the USA's Honeywell to produce cleaner burning transportation fuel in Algeria.

Sonatrach confirmed earlier this year that it expects to complete the refurbishment of its 2.7mn tpy refinery in Algiers before year end, and three new grassroots refineries are planned at Hassi Messaoud, Tiaret, and Biskra.

SDX Energy experiences further success in North Africa

SDX ENERGY INC, one of the front-runners in North Africa's oil and gas sector, has reported positive results of the well test conducted on the Ibn Yunus 1X well following the recent conventional natural gas discovery at South Disouq, Egypt. SDX has 55 per cent working interest and is the operator of the well.

The Ibn Yunus 1X well was drilled to a total depth of 9,608ft and encountered 100.8 ft of net conventional natural gas pay in the Abu Madi horizon. Well test operations have now commenced and the well has successfully flowed natural gas. Working with its partners, SDX will now aim to bring the discovery into commercial production by the end of 2018.

Paul Welch, president and CEO of SDX, said, "The flow test from Ibn Yunus 1X is a very positive outcome which has exceeded our expectations and is a strong endorsement of the significant potential of the licence."

This follows an oil discovery at the Rabul 4 well in its West Gharib concession, Egypt, and two conventional natural gas discoveries within a month in Morocco, at the LMS-1 and LNB-1 exploration wells on the Lalla Mimouna permit, where the company has a 75 per cent stake.

Commenting on the Morocco discoveries, Welch said, "The results of our last two exploration wells have opened up a very significant new play area for us in the Gharb basin. This provides us with the ability to further grow our reserves and production potential in Morocco, where we are targeting a four-fold increase in production from our current portfolio in the medium term."

Sonatrach is pursuing various initiatives in petrochemicals, including a US\$1.4mn project with Total.



Lekoil reports revenue after production at Otakikpo field

LEKOIL HAS REPORTED a full-year revenue for the first time after it achieved commercial crude oil production and sales in 2017 from its oilfield in Nigeria. The company reported a profit of US\$6.5mn for the year ended 31 December 2017 compared with a loss of US\$15.8mn last year. Revenue was US\$30.8mn.

Lekoil expects to increase production at its Otakikpo oilfield to 20,000bpd by 2020, from an average of 5,547bpd from May 2017 to May 2018. It has a 40 per cent interest in Otakikpo, located about 60km south-east of Port Harcourt. Green Energy International, the operator of the oilfield, holds the remaining 60 per cent.

"These are perhaps the most important milestones in the history of the company, and represent the fruits of efforts that have been ongoing since Lekoil's inception in 2010," Samuel Adegboyega, Lekoil's chairman, said.

"Our priority for 2018 is to continue to grow production volumes and profitability at Otakikpo. In tandem, we will aim to progress the appraisal and development of our Ogo discovery in OPL 310. Once we receive the second Ministerial Consent, we plan to finalise funding plans for an appraisal drilling programme. The programme will comprise two wells which will include flow testing. Our aim is to secure enough information to enable the partners to take a Final Investment Decision in 2019 and then to proceed with development in partnership with GE Oil & Gas," Lekan Akinyanmi, Lekoil's CEO, said.

Dr Emmanuel Ibe Kachikwu to attend Africa Oil Week in Cape Town

DR EMMANUEL IBE Kachikwu, Minister of State for Petroleum Resources, Nigeria, has been confirmed as attending Africa Oil Week 2018 which will take place in Cape Town, South Africa on 5-9 November 2018, joining eight other African ministers.

With 88 upcoming oil and gas fields to receive more than US\$180bn by 2025, having such strong government representation of nine ministers attending to deliver bidding rounds and investment opportunities should be a boon for Africa Oil Week as a major transaction platform for Africa.



Image Credit: World Economic Forum/Flickr

Dr Emmanuel Ibe Kachikwu will be visiting Africa Oil Week 2018.

Over the course of the week, leading nations will take meetings and present proprietary

information regarding up-and-coming projects. This will include shallow water licensing in Congo Brazzaville and billion-dollar tenders in critical infrastructure.

With more than 26 per cent of the investment given to Nigeria, it is noteworthy that the minister is attending Africa Oil Week to promote vital transformation projects in Nigeria.

"Attracting inward investment for upstream activities and field development is critical if Africa is to realise its full energy potential," said Paul Sinclair, conference director for Africa Oil Week.

Savannah Petroleum discovers oil in Niger's Amdigh-1 well in the Agadem Rift Basin

UK'S SAVANNAH PETROLEUM said that it has discovered an oil-bearing reservoir in the Amdigh-1 well, its second in a three-well drilling operation.

The company said that it has discovered 22m of oil-bearing reservoir sandstones in the well, which is located in the Agadem Rift Basin in South East Niger.

Savannah Petroleum said it would install a downhole

completion assembly on the well after production testing.

The company has R1, R2 and R3 permits in the Agadem Rift Basin, which has 2P resources of 975mmmbbl and output of 20,000bpd.

"Two discoveries from our first two ARB exploration wells is clearly encouraging for the future of our Niger project. Given these successes, we have now engaged external

consultants to commence detailed development concept evaluation work around the creation of a potential R3 East Area Early Production System. On the drilling front, I expect our near-term focus to remain on the prospects in the R3 area and we expect to provide further updates on potential additional drilling activity over the coming months," Andrew Knott, CEO of Savannah Petroleum, said.



Image Credit: Savannah Petroleum

Workers onsite at Savannah Petroleum's Niger operations.

Kosmos to focus on Senegal and Mauritania

DEVELOPING THE ENORMOUS offshore gas discoveries off the coastlines of Senegal and Mauritania is Kosmos Energy's main focus, according to Tracey Henderson, the company's vice president, exploration.

Speaking at the Africa E&P Summit in London, she said that "gas is the future of Africa".

"The demand for gas is growing in Africa," Ms Henderson told the conference. "Oil has not really delivered the catalyst for progress that was hoped, but gas can ... Oil has already peaked in Africa [but] peak gas is much further out."

She said that oil peaked in Africa and has been in "steady decline ever since."

To properly leverage gas from Senegal, Mauritania and other African gas markets, FLNG is "key to new development", said Ms Henderson.

She added that FSRUs are useful for "opening new markets [and] creating new demand" in Africa where "domestic need [for gas] is huge."

WorleyParsons wins Africa's oilfield development contract in Kenya

TULLOW OIL HAS awarded a contract to Australian engineering company WorleyParsons to provide services for the foundation phase of the South Lokichar onshore oilfield project in Kenya.

According to Tullow, East Africa's oilfield project comprises the development of the Ngamia and Amosing fields to produce an estimated 60,000 bpd of oil which will be transported to Lamu via a 900km export pipeline.

WorleyParsons will provide front-end engineering design



WorleyParsons has extensive experience in oil and gas projects.

(FEED) for the central processing facilities and will support Tullow

as part of an integrated project management team.

GNPC signs 12-year natural gas supply agreement with Russia's Rosneft

RUSSIA'S ROSNEFT HAS signed a preliminary 12-year liquefied natural gas (LNG) supply deal with Ghana National Petroleum Corp (GNPC), a move that will see delivery of natural gas to Ghana's Tema port.

The agreement, which is subject to be approved by the boards of directors of both parties, includes the supply of 1.7 mmtpa or 250mn scf per day.

The agreement was signed during the XXII St Petersburg International Economic Forum.

During the forum, Rosneft and GNPC also signed a framework cooperation agreement that envisages a joint study of high-priority directions of mutually beneficial cooperation in the development of West Africa's oil and gas fields, oil and oil product supplies.

Fredrick Blay, chairman of the board of directors of GNPC, said that with this new agreement, GNPC will play a leading role in the development of West Africa's oil and gas sector.

Rosneft also signed a memorandum of understanding with Nigeria's Oronto Petroleum on potential cooperation in the implementation of oil and gas projects in Africa.



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Local content and unleashing Nigeria's gas potential on the agenda at Nigeria Oil & Gas 2018

ON THE DAY before Nigeria Oil & Gas 2018 officially opens, delegates will be able to attend a seminar on Nigerian content. The day-long seminar will start with addresses from Engr. Simbi Wabote, executive secretary, Nigerian Content Development & Monitoring Board, and Ahmadu-Kida Musa, deputy managing director, Total E&P Nigeria.

Following on from these addresses, a discussion on creating an enabling business environment for Nigerian content to flourish will take place, with Alex Aghedo, coordinator, TUCN contracts, procurement and Nigerian content for Total E&P as the moderator.

Emerald Energy Insitute and the Nigerian Content Development & Monitoring Board will be represented at the third session of the day, which will be on expanding Nigeria's technical capabilities for the oil and gas industry. After lunch, there will be two more



Abuja will be the location for NOG 2018.

sessions – one on the perspectives from indigenous players with senior executives from PETAN, MCG Vowgas and Marine Platforms on the panel; and a closing session on

maintaining adequate Nigerian content compliance and enforcement measures.


With gas development fast becoming a major focus for African hydrocarbon producers – and Nigeria being no exception – there will be plenty of discussion in relation to gas during the conference. Unleashing Nigeria's gas potential as a catalyst for socio-economic growth, maximising Nigeria's gas potential, reducing gas flaring and policy surrounding gas commercialisation are all on the agenda.

Long-term points of discussion will also feature at the Abuja conference, such as developing the downstream sector, refinery building and the ongoing challenges and opportunities posed by the Petroleum Industry Bill for public and private sector stakeholders.

Nigeria Oil & Gas 2018 will be held from 2-5 July in Abuja. www.cwcnog.com

Image Credit: Andrew/Flickr

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The NipeX system consists of two complementary web-based applications that facilitate supplier selection and contract approval processes, namely the Joint Qualification System (JQS) and Electronic Marketplace (eMarketplace). JQS is an online supplier database which provides a standardized and transparent means of pre-qualifying suppliers registered in Nigeria for opportunities in the industry. The E-Marketplace is an online platform designed to facilitate contract processing between operators in the upstream sector and the Nigerian National Petroleum Corporation.

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Final investment decision taken on Zinia 2 field, offshore Angola by Total and partners

TOTAL AND ITS partners said that they have taken the final investment decision on an oilfield off the coast of Angola.

The Zinia 2 project, which has nine wells, will have a production capacity of 40,000bpd. In light of higher oil prices, international oil companies such as Total have taken an interest in developing offshore fields in Africa.

"Zinia 2 opens a new chapter in the history of Block 17. This project will allow to extend the profitability of this prolific block, with over 2.6 billion barrels already produced. Thanks to the favourable fiscal framework introduced by the Angolan authorities for satellite developments, other projects similar to Zinia 2 are currently under consideration on Block 17," said Arnaud Breuillac,



Image Credit: Total

The CLOV FPSO project is important to Total's Angolan operations.

president, Total Exploration & Production.

"The project is also a good example of capex discipline and cost optimisation: the work carried out to simplify the design while capturing deflation allowed the partners to cut the development costs by more than

a half," Breuillac said.

Total operates the Block 17 with a 40 per cent interest, alongside affiliates of Equinor, Exxon Mobil, and BP. Sonangol is concessionaire. It has four FPSOs – Girassol, Dalia, Pazflor and CLOV. In 2017, its production averaged 600,000bpd.

South Africa to speed up shale gas exploration applications in the Karoo Basin

THE GOVERNMENT OF South Africa is planning to fast-track the exploration of shale gas in the southern Main Karoo basin, with a view to maximising production and to reshaping the country's energy economy.

This was announced by Gwede Mantashe, minister of mineral resources in South Africa, during his budget speech in the parliament on 15 May 2018. According to the statement, PetroSA has estimated that the

Main Karoo Basin may have about 205 tcf of "technically recoverable" shale gas.

Therefore, he added, the government plans to speed up the finalisation of exploration rights applications, so South Africa can achieve economic development goals by transforming the energy sector. So far, the South African government has received three applications for shale gas exploration rights, according to the minister. The government plans to issue a notice in terms of the Promotion of Administrative Justice Act, inviting people to comment on the decision.

With shale gas transforming the US energy sector, the South African industry has high hopes for similar success.



Image Credit: Nicholas A. Tonelli/Flickr

The shale gas revolution has transformed the US energy sector.

Process oil demand up in Africa and Middle East

GLOBAL PROCESS OIL demand is forecast to grow 1.4 per cent per year to 7.2 mmt in 2021, according to the Freedonia Group, a Cleveland-based international business research company.

Growth for process oil demand will be fastest in Africa and the Middle East region due to expected above-average increases in African manufacturing.

While India is expected to undergo the biggest growth, India and countries with mature manufacturing markets, such as Japan and South Korea, will limit aggregate growth outlook for the region. According to the review, the rate of growth is expected to be lower than the global average in North America and Western Europe, where manufacturing growth will be the slowest, and higher than average in all other regions.

Multiple factors have been cited as drivers of the market. These include: Increase in world rubber consumption is forecast to accelerate, particularly in developing countries as a result of expanding vehicle parks; fast population growth in developing regions will boost the level of food and beverage manufacturing; and mature manufacturing industries and the offshoring of operations to utilise cheaper labour costs will limit process oil requirements in developed areas of the world.

The report said that the major driving factors for global process oil demand will be: increased manufacturing in developing regions; heightened global trade; and a growing level of energy consumption.

Dana Gas receives payment from Egypt

DANA GAS, THE Middle East's largest regional natural gas company, has been given US\$40 mn from the Egyptian government towards paying down its receivables. With this payment, Dana Gas has received a total of US\$88.8mn from Egypt during 2018.

Dr Patrick Allman-Ward, CEO, Dana Gas, said: "We are pleased to have received this US\$40mn payment from the Egyptian Government which takes our total receipts to nearly US\$90mn for the first half of the year. It is a timely cash boost and highlights the government's publicly stated commitment to substantially reduce the petroleum companies' receivables during 2018."

"The monies will enable us to proceed with important growth initiatives such as drilling Balsam-8 in our Development Lease onshore the Nile Delta, which should provide incremental production to fill our onshore facilities to its capacity," added Dr Allman-Ward. "Our primary focus remains on increasing production and on drilling our first offshore well in Block 6, due to commence in early 2019. Block 6 is highly prospective and contains several material prospects with multi-tcf potential."

Dana Gas first entered the Egyptian market in 2007 and has become the fifth largest gas producer in the country.

In Q1 2018, production was 36,800 boepd. It has title to 14 development leases, three exploration concessions and two processing plants. Its 2P reserves stood at 117 mmboe at the end of 2017.

Aiteo champions the safety and prosperity of Niger Delta communities

AITEO EASTERN EXPLORATION and Production Company has spoken out on behalf of the Niger Delta communities in which it operates in Nigeria.

While the region has experienced issues with illegal bunkering and refining activities, as well as oil theft, Aiteo's management has released a statement to reiterate its commitment to the local communities.

The statement said: "As a socially responsible organisation, Aiteo

understands that the community bears the brunt of illegal bunkering and refining activities."

In an earlier statement, Benedict Peters, founder



Image Credit: Aiteo Group

Benedict Peters, founder and CEO, Aiteo Group.

and CEO of the Aiteo Group reiterated the company's commitment to local content, business growth and supporting the development of sport in Nigeria as part of its corporate social responsibility programme.

"Aiteo is one of the leading indigenous energy companies in Africa and employs more than 300 Nigerians," said Mr Peters. "I look forward to once again focusing all my efforts on growing our business and

supporting sports development in Nigeria and across Africa, such as the CAF Awards, the Nigerian national football team and the Federation Cup."

OPEC launches 2018 Annual Statistical Bulletin with member country data

THE OPEC SECRETARIAT has released the 53rd edition of the Annual Statistical Bulletin (ASB). This year's ASB provides updated statistical data on the oil and natural gas activities of OPEC's 14 member countries: Algeria, Angola, Ecuador, Equatorial Guinea, Gabon, Islamic Republic of Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates and

Venezuela. Some of the major findings of this year's ASB include the 2017 decline of world crude oil production by 701,000 b/d, or 0.9 per cent, as compared to 2016, to reach 74.69 mb/d, marking the first yearly decline since 2009.

OPEC-14 crude oil production fell year-on-year by 926,000 b/d, or 2.8 per cent, while crude production in non-OPEC countries registered gains.

The report also found that world oil demand averaged 97.20 mb/d in 2017, up by 1.7 per cent year-on-year, with the largest increases taking place in Asia and Pacific region, Europe and North America. The 2017 oil demand in Africa and the Middle East grew by around 100,000 b/d, compared to 2016, while oil demand declined in Latin America for the third year in a row.



Image Credit: OPEC

OPEC leaders assembled for a Ministerial Monitoring Committee meeting.

Ugandan government selects consortium for greenfield refinery project in Hoima District

THE ALBERTINE GRABEN Refinery Consortium (AGRC), comprised of YAATRA Ventures, Baker Hughes GE, LionWorks Group and Saipem, signed a project framework agreement confirming its selection by the Ugandan government for the realisation of a 60,000 bpd capacity refinery with a project estimated value of around US\$3 billion.

The refinery, to be located in Hoima district, will process crude oil from fields developed by Total, Tullow and China's CNOOC and future upstream operators. The Ugandan government has included in the project scope a refined-product pipeline to Kampala for transporting finished products from the facility as well as the distribution of refined products.



Image Credit: Baker Hughes GE

Irene Muloni, Uganda's energy minister, with Ms Jandhyala.

"We look forward to the execution phase and delivering a world class facility that represents a unique opportunity for investors. The project will deliver a broad, significant economic development impact for Uganda and the East Africa region," Rajakumari Jandhyala, president and CEO,

YAATRA Ventures, said.

The Albertine Graben Refinery Consortium will have each member undertake a specific role during Pre-Final Investment Decision (Pre-FID) Activities and Engineering, Procurement and Construction (EPC) of the refinery.

NNPC tasks IBB University for Bida Basin oil exploration

THE NIGERIAN NATIONAL Petroleum Corporation (NNPC) has charged the IBB University with more collaboration on oil exploration in the Bida Basin, one of the seven inland basins in Nigeria.

Speaking to the media, Dr Maikanti Baru, group managing director of NNPC, commended the institution on the search for oil in the basin, praising the services offered by Ivory Tower in that area.

Dr Baru disclosed that the corporation had signed a MoU with four states on the development of renewable energy projects, which when completed, are expected to produce fuels and generate about 50MW of electricity. He added that the NNPC would collaborate with IBB University to benefit from their expertise.

Dr Mohammed Saminu Turaki, chairman of council at IBB University, lauded the NNPC for sustaining exploration in the inland basins and developing renewable energy.

Mohammed Nasirudeen Maiturari, vice-chancellor of the university, said that the collaboration with NNPC had boosted the exploration and production portfolio of the basin.



Image Credit: Nazifm/Wikimedia Commons

The NNPC is collaborating with IBB University on Bida Basin exploration.

Wet flue gas plant achieves high efficiency

GE'S STEAM POWER business has successfully completed tests for performance of Unit 1, of the Wet Flue Gas Desulphurisation Plant (WFGD) at Eskom's Kusile plant, the first air quality control system of its kind in Africa.

Located in South Africa, the WFGD Plant will be the cleanest coal-fired power plant in Eskom's fleet.

During its performance tests, Kusile's WFGD plant has exceeded original performance commitments as it achieved 93 per cent removal efficiency rate, to deliver more value to Eskom and the local communities.

Eskom's acting CEO Phakamani Hadebe said "Kusile is the first power plant in Africa to implement clean fuel technology such as flue-gas desulphurisation – a state-of-the-art technology used to remove oxides of sulphur, such as sulphur dioxide, from exhaust flue gases in power plants that burn coal or oil.

"This technology is fitted as an atmospheric emission abatement technology, in line with current international practice, to ensure compliance with air-quality standards, especially since the power station is in a priority air shed area."

GE's scope in Kusile is the Engineering, Procurement and Construction (EPC) of six turbine islands, air cooled condensers and wet flue gas desulphurisation plant (WFGD).

Once in full operation, Kusile power plant will consist of six units delivering 800MW each for a total of 4,800 MW. This is enough power to meet the electricity needs of 3.5 million households in South Africa.

BP Energy Outlook find energy mix is diversifying

THE 2018 EDITION of BP's Energy Outlook, released earlier this year, considers the forces shaping the global energy transition out to 2040 and the main uncertainties surrounding that transition. The speed of the energy transition is uncertain and the new Outlook considers a range of scenarios.

"We are seeing growing competition between different energy sources, driven by abundant energy supplies, and continued improvements in energy efficiency. As the world learns to do more with less, demand for energy will be met by the most diverse fuels mix we have ever seen," said Spencer Dale, group chief economist, BP. "By 2040, oil, gas, coal and non-fossil fuels each account for around a quarter of the world's energy. More than 40 per cent of the overall increase in energy demand is met by renewable energy."

The Outlook offers regional analysis and finds that Africa is playing an increasingly important role in driving energy demand, contributing more to global demand growth from 2035 to 2040 than China.

Trends in regard to innovations, such as the increased popularity of electric cars, are analysed in the Outlook.

"The suggestion that rapid growth in electric cars will cause oil demand to collapse just isn't supported by the basic numbers – even with really rapid growth," explains Dale. "Even in the scenario where we see an internal combustion engine ban and very high efficiency standards, oil demand is still higher in 2040 than it is today."

Natural gas industry leaders join forces to combat methane emissions

THREE GLOBAL ASSOCIATIONS – the International Gas Union (IGU), the International Association of Oil and Gas Producers (IOGP), and IPIECA – have become associate signatories to the Methane Guiding Principles.

These principles have been devised by the Climate and Clean Air Coalition and companies which have signed up include BP, Eni, ExxonMobil, Gazprom, Qatar Petroleum, Repsol, Statoil, Shell, Total, Wintershall and Woodside.

While the three organisations do not have the mandate to enjoin their members, as associate signatories they will play an important role in encouraging the application of the Guiding Principles. According to a joint statement



Image Credit: WhiteEarth Guardian/Flickr

Flaring by oil and gas operators is a major contributor of methane emissions.

from IGU, IOGP and IPIECA, the commitment "forms part of wider efforts by the global energy industry to ensure that natural gas continues to play a critical role in helping meet future energy demand while tackling climate change and improving air quality."

"The IGU supports urgent

and increased efforts towards methane emissions mitigation, and the Guiding Principles are a significant step toward achieving that goal," said David Carroll, IGU president. "Natural gas remains well positioned to make a significant contribution to improving air quality while also reducing carbon emissions."

Cameroon's Logbaba Field looking promising after seismic reprocessing

VICTORIA OIL AND Gas said that it has increased 2P resources from its Logbaba Field in Cameroon after seismic reprocessing and completion of the company's 2017 development drilling campaign.

The London-listed company estimates the resources from the field are now 309bcf, up 52 per cent from its previous estimate. Proven resources or 1P resources at the field are 69bcf, up 73 per cent, according to

company estimates. The 2P reserves level will support a production rate of 90mmcsfd for 10 years, according to the Victoria Oil and Gas statement.

"The results ... provide a significant value upgrade to the Logbaba Project and confirm that the field reserves will meet the growing demand in the Douala market for the foreseeable future. Importantly, this will now enable us to market larger volumes of natural gas on a longer term contractual basis to buyers, providing them with the security of supply they require. We are actively negotiating Gas Sales Agreements for these projects and we will provide updates when appropriate," Kevin Foo, Victoria Oil and Gas chairman said.



Image Credit: Victoria Oil and Gas

The Logbaba rig when it was under assembly in 2016.

TANZANIAN NATURAL GAS BENEFITS THE DOMESTIC MARKET

Tanzania is enjoying significant economic and social benefits through its use of domestically produced natural gas. While there are a few challenges along the way, the news is generally positive for the country's gas market. Georgia Lewis reports.

THE TANZANIAN PETROLEUM

Development Corporation (TPDC) has conducted research which found that using domestically produced natural gas in the east African country has saved US\$4bn between 2015 and 2017. This has had the knock-on effect of increasing access to energy through more energy sources and stimulating the economy.

Greater use of natural gas in Tanzania has, in turn, reduced dependence on heavy furnace oil (HFO), diesel, petrol and jet fuel, particularly in regard to operating machinery. Aristides Katto, the TPDC researcher, found that in 2015 alone, US\$6.7bn was saved by replacing HFO and diesel with natural gas for electricity generation.

"As a country gearing up for industrialisation, Tanzania should bank on natural gas as one of the basic ingredients to making the industrialisation drive a success," Katto said.

In 2017, TPDC announced that a master plan would be drafted outlining how to set up infrastructure to supply natural gas to residential and industrial



Tanzania's Songo Songo gas plant is an important part of the country's natural gas infrastructure.

Image Credit: Iain Cameron/Wikimedia Commons

customers in selected regions.

While there is a strong appetite for natural gas exports from Tanzania, it is estimated that only 10 per cent of the country's natural gas is used for power generation in some industries. The aim of the master plan is to increase the quantity of natural gas used in the domestic energy mix, with the economic

savings that Katto found in his research indicating this makes financial sense.

The scope of the master plan covers gas industry development up to 2045.

It is a broad plan which covers the utilisation of gas for power generation, industrial applications, households, institutions, transport, fertiliser production, methanol production including methanol-to-gasoline, di-methyl ether production and an ambitious gas-to-liquid project, depending on the outcome of a feasibility study into the profitability of such a venture.

Additionally, the Tanzanian government is working at a local level with Dar es Salaam, the country's commercial capital, to connect major industries to gas.

"The plan is to reduce dependence on electricity as the only source of power for production by the industries," Subira Mgalu, deputy minister for energy, told the Tanzanian National Assembly. He said that some important industrial players had already embraced gas as a source of fuel, including Bakhresa Industries, which produces juices, as well as Coca-Cola Kwanza. ♦

“Tanzania should bank on natural gas as one of the basic ingredients to make the industrialisation drive a success”



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CROSS-BORDER OPTIMISM FOR SENEGAL AND MAURITANIA

With Senegal and Mauritania agreeing to cooperate in developing a shared offshore gas field, there is a spirit of optimism shared by these west African neighbours. Georgia Lewis reports.



Developing offshore gas should be a massive boon to the Mauritanian economy.

IN FEBRUARY, SENEGAL and Mauritania signed an agreement in which the neighbouring countries agreed to work together and split production in an enormous offshore gas field. The field is being developed by BP and Kosmos Energy in a partnership.

The Greater Tortue Complex, which straddles the Senegal-Mauritania maritime boundary, is estimated to hold more than 25tcf of gas. It is expected to come online in 2021 with production to be exported via an ambitious liquefied natural gas (LNG) facility.

It is all part of a projected significant uptick in gas activity across west Africa in 2018,

according to a report by Ecobank on emerging trends for the continent, with governments across west Africa seeking to ramp up efforts to secure gas supply, for

“ The Senegal-Mauritania offshore project is an engineer’s dream – it is a challenge – or a puzzle – of the kind that us engineers relish”

export as well as domestic consumption. The Ecobank report recommends deregulating the gas market and allowing market-driven gas prices to help unlock further gas infrastructure development across the region.

Infrastructure development along the entire value chain will be essential for both countries. In Senegal, there is an ageing oil refinery and there has been discussion about creating a second-generation refinery, but more will need to be done in terms of gas processing infrastructure if the BP-Kosmos Energy project is to succeed.

In a speech given by Bernard Looney, BP’s chief executive, upstream, at the 2017 Offshore

Technology Conference in Houston, he was very clear that LNG was integral to the Senegal-Mauritania project, while pointing out that it would be a challenge for both companies.

“Practically, this project is an engineer’s dream. By that I mean it is a challenge – or a puzzle – of the kind that us engineers relish,” Mr Looney said. “It involves producing vast volumes of gas situated in very deep water – around 2700m depth – and moving that gas along more than 100km of flowlines to a modular floating LNG production system.”

Mr Looney went on to tell the conference how the project would benefit the economies of both countries, saying “the story

does not end with the gas being supplied to domestic or export markets.”

“Even more importantly, the revenues from that gas will boost the economies of Mauritania and Senegal,” he said. “The project will have both direct and indirect employment impacts across the two countries, and we will be working with both governments to support the development of local capabilities.”

For Kosmos Energy, the Senegal-Mauritania project is part of its wider work as a frontier operator in the west African hydrocarbons market. Last year, Kosmos Energy added to its exploration portfolio in the region by entering into three oil and gas contracts in Equatorial Guinea following the EG Ronda licensing round.

In March this year, Mauritania's gas ambitions received an additional boost when it was announced that the World Bank had approved a US\$20mn International Development Association (IDA) grant to boost its capacity to negotiate investment agreements for the Greater Tortue discovery. The grant aims to help Mauritania utilise international experts to strengthen the institutions involved in the management of the field and to enhance the fiscal, legal and regulatory framework, as well as assisting the government in effective engagement with private sector stakeholders.

“This grant will strengthen Mauritania's capacity to ensure a major gas resource is developed effectively by private operators



Bernard Looney,
chief executive, upstream, BP.

with strong support from the government. We trust all stakeholders will be provided an opportunity to engage and contribute to accelerate inclusive growth in Mauritania,” said Laurent Msellati, World Bank

country manager for Mauritania.

It is hoped that the IDA grant, along with a similar World Bank project for Senegal, will be a role model for cross-border cooperation in Africa, particularly after Senegal and Mauritania were able to quickly resolve cooperation issues in regard to the maritime border.

“The development of this joint resource will require strong cooperation between the Governments of Mauritania and Senegal,” said Riccardo Puliti, senior director, energy and extractives global practice at the World Bank Group.

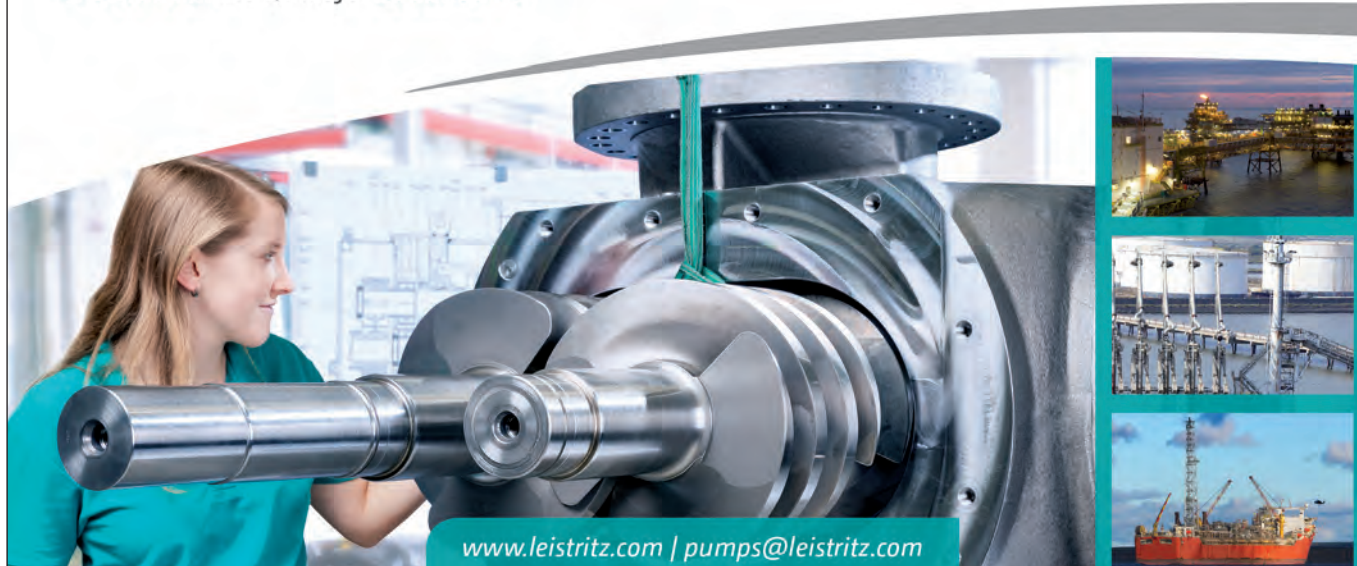
“The Government of Senegal is receiving similar assistance, so this project could very well serve as an example for other countries that share natural resources with their neighbours.” ♦

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POSITIVE OUTLOOK FOR OIL AND GAS IN CÔTE D'IVOIRE

With a strong focus on gas-to-power, as well as a busy time for offshore oil operators, there is plenty of positive hydrocarbons news coming out of Côte d'Ivoire. Georgia Lewis reports.

AT THE END of 2017, Thierry Tanoh, the Ivorian energy and petroleum minister announced encouraging news for the west African country's hydrocarbons industry. He said that average crude output for Côte d'Ivoire was revised from a previous estimate of 38,000 bpd up to 40,000 bpd. In regard to gas production, he said that was "significantly higher" at 275 mcf per day, revised up from an earlier estimate of 200 mcf per day.

As is the case with many other African countries, gas is being used as a major source of fuel for electricity generation. The benefits are obvious – it is the cleanest-burning of the fossil fuels, it is a reliable bridging fuel while renewable energy technology improves and, because it can be ramped up quickly, it is a reliable bridging fuel for when renewable sources, such as solar and wind power, fail. In January this year, Minister Tanoh announced that work on the new units at Ciprel and Azito's combined-cycle gas turbine (CCGT) plants would commence this year near Abidjan, the capital. In Côte d'Ivoire, majority-private sector players, such as Foxtrot and Canadian Natural Resources, are responsible for supplying the LNG for thermal energy production. The upgrading work will add a further 30 MW of



Image Credit: Abdallah/Flickr

Gas will continue to play a major role in bringing electricity to domestic and industrial customers in Côte d'Ivoire.

capacity to the 430 MW plant which supplied approximately 25 per cent of Côte d'Ivoire's power.

Canadian Natural Resources is also involved in oil production

“Majority-private sector players are responsible for supplying the LNG for thermal energy production”

with the East and West Espoir reservoirs, which are located about 60km south-west of Abidjan. The field uses highly deviated wells and water injection as well as other enhanced oil recovery techniques. The light crude is processed, stored and offloaded using an FPSO vessel. Additionally, the deepwater Baobab field, located 8km south of Espoir uses an FPSO for processing, storage and export.

Foxtrot, meanwhile, announced at the start of 2018 that it would be expanding its hydrocarbons presence in Côte d'Ivoire with the signing of two

production sharing contracts (PSCs) for exploration and production on two offshore blocks, CI-12 and CI-502. The contract was signed between Foxtrot, its partners SECI and PETROCI and the Côte d'Ivoire government. The blocks are located offshore Jacqueville in water depths up to 1,000m in CI-12 and between 1,000-2,000m for CI-502.

In the first phase of the contract, seismic processing, geological and geophysical studies will take place to confirm any gas and oil deposits and to set out a plan for the field's

Image Credit: Guillaume Migon/Flickr



Offshore oil opportunities abound for Côte d'Ivoire operators and investors.

development with the aim of using the resources to meet Côte d'Ivoire's energy needs. The minimum investment over three exploration periods is more than US\$70mn for both blocks.

Tullow is another big African player extending its Ivorian reach. In February this year, Tullow signed two exploration licenses for CI-534 and CI-520. Work began on these two blocks in April 2018 with a full tensor gradiometry gravity survey commencing. In 2019, Tullow expects to acquire 2D seismic data. This follows on from four licenses awarded to Tullow in October 2017 in CI-518, CI-519, CI-301 and CI-302, covering 5,035 square kilometres along the Ivorian coastline, mostly west of Abidjan. These four blocks are situated in a proven petroleum system, as indicated by multiple oil seeps and production from the Eboinda oil sands.

Tullow is optimistic about the prospects of these four blocks and said in a statement that "if

commercial discoveries are made, the maturity of the Côte d'Ivoire oil industry suggests a relatively short and low-cost path to production".

At a government level, the International Monetary Fund's (IMF) report on a team visit to Côte d'Ivoire in April 2018 noted some concerns in regard to the country's economic performance including the need to facilitate reforms for ongoing fiscal and social stability.

According to a statement from the IMF, the team "noted the efforts to mitigate fiscal risks by advancing on restructuring the national oil refinery and public banks."

Later this year, Côte d'Ivoire will get an opportunity to showcase its extractive industries sector with the second edition of the forum and exhibition of the Economic Community of West African States (ECOWAS), called ECOMOF 2018, under the theme "Strategies to promote the development of mineral and oil resources in West Africa".

This will be held in Abidjan from 9-11 October and it will allow the country to promote its oil and mining sectors through outlining investment opportunities, presenting implementation actions and discussions between other ECOWAS member states in regard to cross-border management and cooperation, a functional regional marketplace and regional strategy development. ♦

“If more commercial discoveries are made offshore, there should be a relatively short, low-cost path to production”

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SIERRA LEONE'S LATEST OFFSHORE ROUND EXTENDED UNTIL SEPTEMBER

The Petroleum Directorate of Sierra Leone is optimistic about the prospects for the blocks that will be allocated in the country's latest offshore licensing round. Georgia Lewis reports.

SIERRA LEONE'S FOURTH offshore petroleum licensing has been extended until 27 September 2018. The round was originally scheduled to close at the end of June but the bid deadline has been moved to September because of an extended election period resulting from the run-off between Sierra Leone's two main political parties.

This round is offering five contract areas featuring a new block system. This includes areas of undeveloped discoveries from earlier drilling campaigns and there are shallow, deep and ultra-deep blocks on offer.

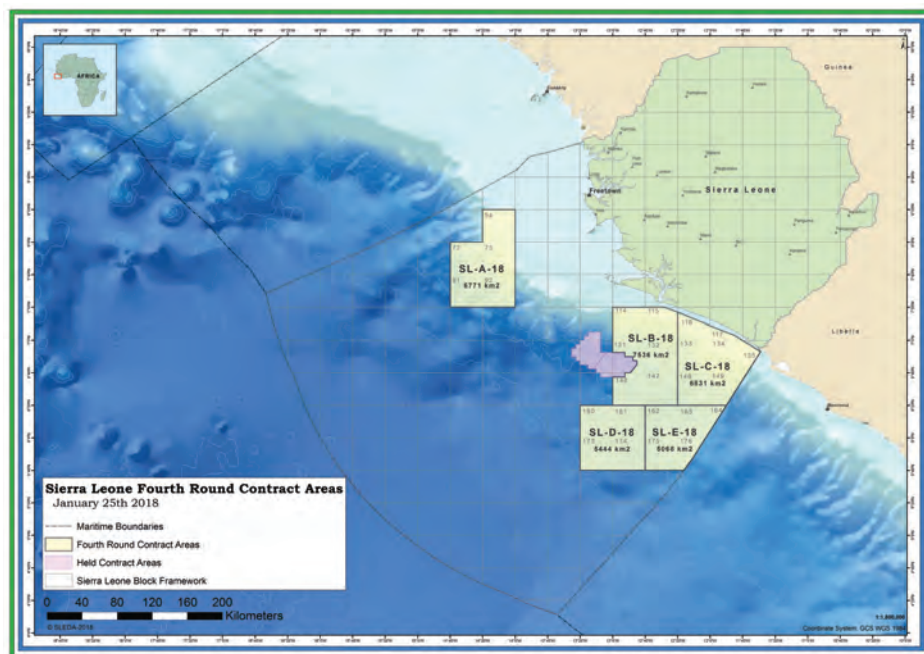
The licensing round was launched in London in January 2018 and more than 30 oil companies attended.

At the end of last year, *Oil Review Africa* reported on the launch of the fourth round when it was announced at Africa Oil Week by Raymond Kargbo, director general of the Petroleum Directorate of Sierra Leone (PDSL). The licensing round is supported by the Getech Group through its subsidiary, ERCL.

The data rooms include technically detailed information such as a 15,000km line of 2D seismic data, more than 10,000km² of 3D seismic data, all wells from the 2009-2013 drilling campaigns, which produced four discoveries.

On the prospects for the Sierra Leone blocks, Jonathan Copus, CEO of the Getech Group said: "As exploration interest steps up in the neighbouring waters of Guinea, potential investors are able to access an extremely high quality technical database to assist in their evaluation of

“ The data rooms include a 15,000km line of 2D seismic data and more than 10,000km² of 3D seismic data, all from 2009-2013 ”



A map of the blocks which are incorporated in Sierra Leone's latest offshore licensing round.

the undoubted potential of the Sierra Leone margin. We look forward to the fourth licensing round and assisting the Directorate in attracting investment in the upstream petroleum sector of Sierra Leone."

In a further boost for Sierra Leone's oil fortunes, African Petroleum, an exploration and production company announced at the end of 2017 that a survey indicated a significant increase in potential. African Petroleum commissioned an offshore survey by petroleum consultancy, ERC Equipoise. The results show net prospective oil resources were about 75 per cent higher than the previous estimate from 2015, up to more than 2.5bn barrels.

It could be a positive alignment of multiple factors for Sierra Leone's oil prospects with the oil price making a strong recovery to more than US\$70 a barrel, as well as a fall in costs necessary to exploit ultra-deepwater oil discoveries off the west African coast.

In a statement, African Petroleum CEO, Jens Pace said: "We will continue our de-risking efforts on these licenses and, in due course, work towards formulating a suitable drilling strategy that meets with the current license commitments." ♦



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LEVERAGING TECHNOLOGY FOR REMOTE WORKER TRAINING

What separates a good company and a great company? Often, great companies have a strong identity and a strong business culture. However, for oil and gas companies with remote workers and independent workers, that can be hard to achieve. The answer may be in the cloud.

WITHIN THE INDUSTRIAL sectors, oil and gas, and energy sectors, remote workers and small independent teams work everywhere for you. Particularly across the continents of Africa and the Middle East, and those who are based offshore, a handful of people will be hundreds of miles away from any of their colleagues. Of course, we have social media and promotional materials, but today, these are less effective, with colleague engagement decreasing over time. This is why targeted advertising using information collected off social media and web browser can be so crucial.

Across many of the sectors above, we use cloud technology to improve efficiencies, operational strategies and production flow. This can be done with smart flow meters in refineries, Augmented Reality (AR) and Virtual Reality (VR) glasses and screens, and tracking and response apps on smartphones. But a business culture is harder to define, pin down, and quantify. In fact, many workers may not even realise that they are part of a business culture. Those isolated are in even more danger of losing sight of company goals and instilling business values and ethics into their own work.

For workers to understand what the company is trying to achieve, we can continue to use cloud technology. In particular, we



Smartphones can empower remote workers and improve efficiencies.

can harbour elearning resources that workers can access from anywhere in the world with collaborative tools to engage with their other colleagues. This can be driven by both management and by colleagues to promote a business culture and to engage with it. This can be done via a learning platform.

In practice, managers can speak to their team by recommending reading, videos, audio and other content, both produced internally and externally, to allow them to have a conversation and question their own business culture and education and engage with the company's business culture. And

because this is all done via the cloud, anyone, near or far, can be part of this conversation, galvanising your workforce.

This is important for your workers for a number of reasons. First, a colleague exuding the company's ethos will sell the company positively to every client they visit. Secondly, they will be more involved within the company and will feel more valued, and therefore will value their employer more and third and finally, and probably most importantly, their compliance will increase, decreasing HSE risks, saving the company money.

There are also benefits such as improving staff retention through growth opportunities and the ability to 'skill up'.

Cloud learning and communication has a number of benefits for remote workers. Its relatively low cost and potential cost savings could be vital to efficiencies. Furthermore, the inclusive mentality and a great business culture will help with staff retention, safety compliance and transparency and a greater manager employee relationship. For many businesses, this may be the answer to many issues for remote workers. ♦

By Kestell Duxbury, Knowledge Editor, BlueBottleBiz.com

IMPROVED OIL PRICE DRIVES AFRICAN M&A ACTIVITY

The signs of recovery that were witnessed in the Africa mergers and acquisitions market look set to increase during this year. Leading consultancy firm EY analyses the promising news for deals across the continent.

THE MERGERS AND acquisition (M&A) market for the oil and gas sector in Africa showed signs of recovery in 2017. After several years of slowdown, the recovery comes on the back of companies who have raised cash for capital projects through divestitures; improved their balance sheets and are replenishing upstream reserves.

There was a 62 per cent increase in total deal value from 2016 to 2017. In 2017, there were 65 deals with a total value of US\$8.6bn. The upstream sector dominated deal activity totalling US\$7.3bn, up from US\$4.6bn in 2016. One major upstream deal was ExxonMobil's US\$2.8bn acquisition of a 25 per cent stake in Eni's operations in Mozambique. This is a major addition to ExxonMobil's natural gas portfolio.

There were few deals in downstream in 2017, but, deal value doubled to US\$1.2bn in 2017. A major deal was in Gabon where Royal Dutch Shell sold all its onshore oil and gas operations and related infrastructure to Assala Energy for US\$628mn. Portfolio upgrading was the driver for both companies

"Investor confidence across Africa appears to be returning," says Claire Lawrie, EY Partner and Oil and Gas Advisory Lead for Africa, India and the Middle East. "We see deals happening across several countries in Africa rather than deals being



Claire Lawrie, EY Partner and Oil and Gas Advisory Lead for Africa, India and the Middle East.

concentrated in just one or two countries.

"The partial recovery of the oil price has improved the deal environment. 2017 was the best year for deal making in Africa since the oil price fall in 2014. Furthermore, companies have more cash to spend after years of cutting costs and improving their balance sheets. To date, the deal activity has been highly focused on exploration assets.

Replenishing upstream reserves and growth is back on the agenda. In Southern/Central Africa, Statoil, Total, ONGC Videsh have all showed interest in the exploration sector."

According to Lawrie, the deal-making will continue to follow capital availability and

operational success. Africa's political and fiscal regimes remain an important factor for attracting investment. "Majors are continuing to upgrade their portfolios and generate cash from divested assets such as Royal Dutch Shell's upstream operations in Gabon and Chevron's downstream operations in South Africa," she adds.

Recovery in full swing

EY is optimistic about 2018 being a good year for oil and gas M&A in Africa as part of a recovery trajectory evidenced since 2017. Lawrie explains that several industry related factors are driving recovery.

"The oil price has partially recovered" she says. "There is

more appetite now for reserve replacement for growth as can be seen by high interest again in exploration assets. Majors continue to upgrade their portfolios as they improve working capital, so we may see some more disposals."

Political and economic landscape

There are political shifts in major economies such as Angola and South Africa to elect leaders who are perceived to be more business friendly. Although it is early days and investors are still in a 'wait and see' mode. "The lacklustre macroeconomics of low growth, high inflation and currency volatility which marred the last few years is getting better," Lawrie concludes. "This is making valuations easier and giving investors some more confidence.

"We expect the M&A market in West Africa in 2018 to be busier. Nigeria is likely to see increased deal activity. The monetary environment is improving, helped by the oil price recovery and the security situation in the Niger Delta is improving. The MSGBC Basin will continue to attract explorers. Following the giant Yakaar gas discovery offshore Senegal, and the Cairn-led deepwater oil discovery, the Basin is expected to see an uptick in exploration activity." ♦

www.ey.com

CORPORATE SOCIAL RESPONSIBILITY DELIVERED VIA TECHNOLOGY

Any corporate social responsibility (CSR) message can alienate the local workers in developing countries, particularly if the message is coming from a European or North American perspective. But this could be overcome via a Learning Management System (LMS).

SIMPLY PUT, AN LMS is a piece of software that can deliver the application, documentation, track, report and deliver learning or educational resources. These come in a variety of forms to complement each sector and industry, but this is the basic premise that we shall use for this example. An LMS, first and foremost, can give your workers, wherever they may be in world, information to help them improve themselves and their work. This can improve their working output, their work-life balance and their efficiency. This, of course, brings obvious benefits to both the employee and the employer. However, an LMS can do more, and one of those things is to improve the CSR message of the company.

A LMS is a secure technology that is often integrated into a company's existing systems. This gives reassurance to companies who are concerned about security. In light of the infamous 2012 Saudi Aramco hacking, external systems that integrate a company's computer systems can be a security risk, but these can be managed internally and are increasingly secure.

Some LMSs can integrate a clients' own content by uploading their own training material, as well as any other content, to the LMS. This means that they could include management training from their



An LMS can help instill a safety culture at all levels of an operation.

Image Credit: Eni/Flickr

own library with some working examples to drive home vital learning skills. This can help workers, whether at home or working remotely, learn about the company's message both at home and further afield. Greater communication channels, supported by the learning methods from an external learning provider, can improve colleague engagement and improve understanding of a company's CSR goals.

One issue that many have when it comes to training is harvesting the best from their employees through hard skill training. An example of this is if you need to train someone to adjust and monitor a smart valve to control oil flow. You can demonstrate to them what should

happen, what shouldn't happen, and how to look for any unusual activity that suggests that they should take measures to rectify this. It is a great skill to have if they just need to work with smart valves. However, a soft skill that may be useful to work alongside this is the ability to gauge risk and hazards. A skill like this can be used to interrupt the workflow if they spot a potential risk in the future, improving safety and potentially dangerous situations. Not only is this applicable to them monitoring smart valves, but is transferable to other tasks that they may need to complete in their everyday line of work. This is a basic example, but pairing hard and soft skill learning can be difficult. Trainers

often don't have time to teach soft skills as they are broader and take more time.

By harvesting a learning platform via an LMS, any worker, remote or inbound, can continue their learning away from their trainers to enforce transferable skills, which in the case of safety, can be a net saving for the company and also an investment in the worker. This can feed into an overall CSR project by promoting good working efforts for every colleague, increasing the company's safety record and making the worker feel appreciated via crucial transferable investment. ♦

By Kestell Duxbury, Knowledge Editor, BlueBottleBiz.com

GLOBAL DECOMMISSIONING CONSORTIUM REDUCES THE BURDEN

A collaborative supply chain approach to global decommissioning has been launched, offering an end-to-end solution from industry leaders, to reduce the decommissioning burden, risk and cost for operators.

THE NEW GLOBAL decommissioning consortium, which includes Lloyd's Register, WorleyParsons, and Ardent, brings together 350 years of collective experience to reduce the interfaces, costs and risks of decommissioning for the oil and gas industry. This consortium includes leading experts to cover all aspects of decommissioning, from late life management to planning, readiness for removal, execution, waste management and monitoring post removal. The consortium has the unique capability to take well operatorship, duty-holdership and title of offshore structures, in addition to providing independent third-party assurance.

"This consortium offers a new, collaborative approach to decommissioning for operators," highlights Steve Gilbert, director of asset management and decommissioning from LR. "It represents a fundamental step change for the industry, aligning assurance, project management, and safe, fit-for-purpose removal and disposal.

"Decommissioning can be daunting; the cost uncertainty, the colossal project scope and the unknown long-term liabilities. The consortium helps to reduce the overall cost, time and liability burden for operators and allows them to focus resources on more fruitful



Image Credit: Roy Luck/Flickr

Best-practice decommissioning is essential at the end of a project.

activity, knowing that their decommissioning project is in safe hands. As experts in asset and risk management, and a number one provider of verifications services, this approach will assure safety, efficiency and reputation."

Peter Pietka, Ardent CEO, says: "We bring to the

consortium over 150 years of maritime retrieval experience, as a global leader in salvage and wreck removal. Through our expertise, we are in the unique position of being able to apply techniques and learnings from other sectors such as marine wreck removal, to improve how to tackle the increasingly

important challenge of decommissioning offshore oil and gas infrastructure."

Global spending on oil and gas decommissioning is expected to be \$13bn per year by 2040. The consortium plans to deliver smarter decommissioning activities with end-to-end project management and execution for operators in Europe, Asia and Americas that include best practices from other sectors such as float and tow, used widely in salvage.

Offering considerably more technical value for operators than rival partnerships, the members of the consortium have a proven track record across all areas of late life and decommissioning. It can ensure project efficiency, regulatory compliance and cost certainty in the execution of decommissioning activities, wherever in the world the assets may be.

John Cox, global decommissioning lead, WorleyParsons, says: "The value for industry is that our combined expertise covers the full decommissioning lifecycle. We have the unique capability to become well duty holders and take title of offshore structures plus we offer independent assurance throughout the decommissioning process. This consortium provides a new benchmark in cost-effective decommissioning activities, with safety and peace of mind for the operator." ♦

Woodside has used technology to streamline all operations.

MANAGING RISK AROUND MAINTENANCE IN THE DATA-RICH AGE

Image Credit: Woodside Energy

Technology is disrupting the world of business. Digitalisation for oil and gas could be worth up to US\$2.5tn for the industry over the next decade. What is the reality of risk in the current business world and how can technology and data enable safer, efficient environments for our businesses?

ARTIFICIAL INTELLIGENCE IS already changing businesses in unexpected ways. As demonstrated by Woodside Energy, who deployed artificial intelligence to reduce their workforce and improve efficiencies. What they didn't predict was through the knowledge that this new technology has given them, their existing staff would become more engaged and more efficient, which led to more work and increasing their workforce.

The case of a 19-year-old's 'robot lawyer' which overturned 160,000 parking tickets with artificial intelligence, is also another example of how AI is driving efficiencies. With the rise of technology and the speed of change in the AI market, new industries and new ways of doing things are appearing quickly. If you're not adapting, your competition will be. To stay ahead, you must adapt to this new reality.

What does this mean for risk management? We're all using artificial intelligence in our everyday lives. Why not use these intelligent machines to create safer, risk reduced environments?

Risk management, in the new digital future, will focus not only

AI or the human element but for optimal risk management it must focus on human intelligence and artificial intelligence combined. This has been shown in the manufacturing of components to hold cables above a road in The Hague, by using the best of both the human and computer, the component can now support the same weight but weighs 75 per cent less and is 50 per cent smaller than either the human or computer component alone.

When we adapt this combined approach into risk management we can enhance quality, provide deeper insights and reduce costs. Through AI we have automated set-up and assessment of risk scenarios. AI and digitalisation can provide real time insights as the risk environment changes based on weather conditions, manning, work orders, maintenance programmes and inspection programmes. We can reduce the time to build risk models, reduce man-hours to build the model, automate document compliance, improve knowledge transfer and optimise engineering time by focusing on design improvements rather than modelling.

The reality of all these new technologies is that, in conjunction with more

sophisticated threat actors and vectors, it is becoming increasingly more complicated to protect business critical assets. To date many organisations have relied almost purely on technology for protection. The focus has been on creating an impregnable fortress and protecting all assets within that fortress to the same level, from the canteen menu to the client database. This is an expensive and ineffectual approach.

To manage security properly, businesses need a holistic approach encompassing technology, people and processes, which helps maximise the efficacy of their technical defences and reduce risk. This approach must be risk-based and driven through security analytics and threat intelligence so as to understand what to protect and how. This builds a scalable security posture providing better resilience in the face of attack.

We're now in full swing of industry 4.0 and the digitalising our businesses as technology is delivering more and more for our businesses, drones for inspections, AI, augmented reality, asset digital twins and centralised data. The LR Foundation is offering industry partners to be early adopters of

innovation without the associated financial risk. The Lloyd's Register Safety Accelerator will address issues, acting as a barrier to improved industrial operation.

We're using the virtual environments today to improve the risk environment offshore. This helps you experience real-life challenges which the oil and gas industry is exposed to, and in a non-threatening environment, thereby enhancing your own knowledge of the issues the industry faces offshore.

The value to a business using VR technology is immense and helps to reduce the costs of non-productive time, measured in hundreds of millions of pounds annually across the industry, due to operating down-time and inefficiencies.

There is significant benefit and value to be gained from managing risk through technology. The reality is that the business environment, oil and gas and energy sectors are changing, and risk in the current world can be enhanced using new technology and data to enable safer, risk reduced and efficient environments for our businesses. Not just in the future, but now. ♦

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CLASSIFICATION OF FLNG AND FSRU PROJECTS

With so many large LNG projects coming onstream, the nature of gas as a primary fuel for the developed world and emerging economies, is changing. It is predicted that this expansion will drive down technology costs and therefore open up gas as a fuel to an even larger market.

WITH GREATER AVAILABILITY of gas, the trading nature of gas has also started to change. While gas prices have historically tended to be more localised and more dependent on fixed long-term sales contracts than oil, we have seen a move to a more active spot market – often at considerable discounts to long-term contract pricing. This has been enabled by the increase in transportability of LNG due to growth of the LNG carrier fleet and receiving facilities. The lower gas price environment has several effects:

- ♦ A push for cheaper, simpler, field development solutions on the upstream (FLNG) side.
- ♦ An increase in demand for supply-side FSRU (floating storage and regasification unit) solutions which are on the upside of a lower gas price and provide a practical solution to the growing energy demands of developing nations – or anywhere where extended electricity grid networks are impractical.
- ♦ Renewed interest in gas compression projects.

These market developments are having inevitable knock-on effects for the types and designs of assets that are favoured for production or supply of gas from LNG – and consequently are exerting pressure on class societies to deliver rules and guidance for these new designs. Instead of having a land-based LNG plant fuelled from a (consequently very large) floating platform (meaning that the gas reserves would need to be sufficiently large to justify the large field development capex) FLNGs are smaller, simpler assets which can be mobilised more quickly, allowing swift monetisation of projects.

- ♦ Simpler liquefaction process allowing smaller footprint, but at reduced efficiency.
- ♦ More complex, miniaturised liquefaction

FPSOs are a versatile option for gas operators.



Image Credit: keas turn/Flickr

- plant offering smaller footprint but better efficiency.
- ♦ Number of (more traditional) gas floating production storage and offloading (FPSO) units providing gas conditioning linked with a centralised liquefaction facility – allowing individual units to be smaller and less complex, potentially reducing the need for more extensive subsea infrastructure.
- ♦ FLNG providing liquefaction (only) facilities for gas produced and conditioned elsewhere and accessed via land or subsea pipeline. Advantages over land-based solutions for remote areas or those with difficult political or social circumstances.
- ♦ Near shore export FLNGs ranging from simple LNG storage and offloading to full blown FLNG solutions.

All of these options are now being explored or actively developed in response to various local circumstances. As a consequence of driving down cost, the industry seeks innovative solutions to monetising large and small offshore remote gas, proposals being considered are for:

- ♦ Very large offshore floating gas compression projects and compressed natural gas (CNG) for combined storage and pipeline solutions.
 - ♦ Long deep subsea compressed gas pipelines.
- FSRU designs can come in a variety of shapes

and sizes. It is the high versatility of this asset type which gives it its advantages, particularly over shore-based solutions. However, this throws up challenges to class societies in producing, revising and adapting their rules and guidance to meet the technical demands of a diverse group.

- ♦ Gas ship with regasification facilities.
- ♦ Storage barge with regasification facilities.
- ♦ Near-shore, at-shore or at-sea locations.
- ♦ Mooring systems, hull and mooring design for tidal conditions.

The much reduced operating costs of an FSRU with respect to a trading LNG carrier can make conversion an attractive option for LNGC operators.

So where does class fit in this changing environment and how can it support innovation while not compromising on safety?

The view of Lloyd's Register (LR) is that new rules do not necessarily provide the most effective solution to highly focused projects, as they tend to deliver a more refined vision of prescription in an environment where the safest, most cost-effective solutions are usually found by allowing developers more freedom on innovative concepts. LR believes the core elements of its Offshore Rules provide a suitable foundation for offshore projects with the flexibility to be able to be applied over many concepts. This is then supported by written guidance for specific project types. ♦

PRODUCED WATER AND CRUDE GATHERING: LEAK DETECTION CHALLENGES

The US shale boom highlighted the importance of produced water management along pipelines. Leak detection is imperative to this process and the lessons learned from the US can be applied to other markets, such as Africa.

OIL PRODUCERS LAID hundreds of miles of gathering pipelines to keep pace with shale boom across North America. Produced water production increased exponentially with oil and gas production. US oil and gas wells alone now produce over one trillion gallons per year of produced water, the inadvertent byproduct that must be contained and transported to disposal or reclamation sites. The everyday use of trucks to carry this dirty water creates its challenges such as cost, safety and traffic congestion. Produced water is considered hazardous to the environment. It is prudent to consider cost-effective options for leak detection on these pipelines as well as on the crude gathering networks. The December 2016 leak detection study, "Pipeline Leak Detection – Field Evaluation Of Multiple Approaches For Liquids Gathering Pipelines", commissioned by the state of North Dakota, and written by the Energy & Environmental Research Center, the University of North Dakota states:

"Field evaluation results suggest that the addition of CPM to an unpressurised gathering system could provide a 96 per cent reduction in total spill volume when compared to daily flow accounting and would reduce the time to detect to less than two hours."



The world can learn from the US pipeline experiences.

The produced water pipeline infrastructure gathers produced water from temporary storage available at production sites and typically uses automatic pumping to transport the produced water to temporary storage, to a disposal site, or a reclamation facility. The crude gathering network collects crude from the wells and carries it to temporary storage or delivers it directly into a transportation pipeline. Crude gathering networks and the produced water networks share challenges for leak detection:

- ◆ Product composition is variable depending on the specific well, the production field, and the region, and there are usually no density measurements available to the SCADA from each well.
- ◆ Gathering networks can have many injections and deliveries.

- ◆ Implementation speed; well-pads can be added weekly as new production comes online.
- ◆ Dynamic nature of injecting from numerous wells at different flow rates.
- ◆ Limited access to the right-of-ways to add instrumentation at the branch connections, so typically there is only flow and pressure data available from the LACT units at the wells and at the outlet.
- ◆ Constrained communications bandwidth limits the SCADA update rate to minutes at best.
- ◆ Draining can cause slack in the network pipelines filling as injection pumps operate intermittently.

Such challenges explain why many leak detection methods that work on transmission pipelines may be unsuitable for a gathering system or produced

water system. Factors that influence the performance of leak detection technology for these upstream systems include: number and quality of sensors on the pipeline; availability and quality of telecommunications system; pipeline operating scenarios such as transient events from continuous start and stop of injections and deliveries and slack flow conditions.

Pumps on the wells at inlets of a gathering system frequently start and stop and flow rates change often; there is seldom a steady state as normal operating conditions tend to always be in transient. Some technologies are hard-pressed to cope with transient behaviour and must desensitise to avoid false leak alarms.

With a rising demand for nimble, efficient and cost-effective pipeline leak detection, the statistical corrected volume balance technology has proven to be the most suitable and reliable leak detection technology for gathering systems. Field deployments show the SCVB LDS functions well with minimum instrumentation and slow data scan rates. This system continues to prove itself in the production fields, detecting real leaks quickly. ◆

*This is an abridged article from Atmos International;
www.atmosi.com*

BUREAU VERITAS: A NEW GLOBAL PARTNER FOR HIGH STANDARDS IN NIGERIA

Bureau Veritas, a partner providing inspection, auditing and certification services to the Nigerian oil and gas industry, is a new actor in the SON Conformity Assessment Programme (SONCAP), bringing 190 years of experience in conformity assessment and its global network.



Image Credit: XEON/Wikimedia Commons

Bureau Veritas has long been a partner with the Nigerian oil and gas industry.

OHIOZE UNUIGBE, **COUNTRY** Chief Executive of Bureau Veritas, Nigeria Limited, talks to *Oil Review Africa* about the company's new role with SONCAP.

Tell us about SONCAP – what is it and why is it important to Nigeria?

SONCAP is the pre-export verification of conformity programme deployed by the Standards Organisation of Nigeria (SON) to ensure that products imported into Nigeria comply with the applicable Nigerian Industrial Standards (NIS) or equivalent approved international standards. SONCAP addresses the challenges of

substandard and unsafe products entering the domestic market. It is important to Nigeria because it improves the quality of products and protects consumers against dangerous, substandard or counterfeit products.

“SONCAP addresses the challenge of substandard products and eases trade operations, thus safeguarding the domestic economy”

It eases trade operations in Nigeria by preventing delays in clearance and prevents unfair competition of poor quality imports, thus safeguarding the domestic economy.

What is the impact of Bureau Veritas' appointment with SONCAP on the oil and gas industry in Nigeria?

Bureau Veritas' one-stop shop offer is an additional advantage for the oil and gas sector and all other industries. As a unique partner, we propose the SONCAP certification in addition to the global range of services offered to the oil and gas industry up to now such as inspection, testing, auditing, asset management integrity solutions and certification.

What services can Bureau Veritas offer to help customers meet SONCAP requirements?

As an independent accredited firm for SONCAP, Bureau Veritas is authorised to carry out pre-shipment conformity assessment and verification and to issue the certificates that are mandatory for importation and Nigerian Customs' clearance: Product Certificates 1, 2 and 3 and SONCAP Product or Shipment Certificates.

How can Bureau Veritas make the SONCAP process easier?

Bureau Veritas is an historical actor in conformity assessment programmes, the first to become accredited at the international level.

Our worldwide coverage of 1,400 offices and laboratories allows us to carry out pre-shipment verification in any country. We deliver an extensive panel of testing and analysis services for consumer goods, industrial products and commodities – including oil and petrochemicals – through our network of accredited laboratories.

Importers and exporters can keep track of their pre-shipment inspections at Verigates, which is our web platform dedicated to pre-shipment inspection programmes. Verigates allows them to require an inspection, to get real-time updates on their inspections and receive electronic certificates.

What other plans does Bureau Veritas have for its Nigerian oil and gas clients?

Bureau Veritas is ready to deploy Smart Inspection tools to aid the inspection process in the oil and gas industry.

The number of companies introducing wireless or electronic technology into the industry is increasing rapidly.

As companies embark on their digitisation quest, partnering with a knowledgeable technology and compliance expert such as Bureau Veritas is a critical success factor being adopted by many companies.

Is there a case study of a successful collaboration between Bureau Veritas and a major client?

The e-CODS (electronic connection of drawings system) – this shows how Bureau Veritas is working with operators and



Bureau Veritas hopes to diversify into agriculture, among other sectors, but oil and gas remains important.

service companies in the oil and gas industry to help innovate and increase their efficiency as their solutions partner of choice.

Last April, Bureau Veritas and Samsung Heavy Industry (SHI) mutually celebrated the milestone achievement of the first successful year of utilisation of e-CODS technology.

e-CODS is a fully integrated digital process facilitating and speeding up drawings and

comments transmission between VeriSTAR Project Management, which is the Bureau Veritas Marine web-based collaborative platform, and SHI's counterpart technology, i-DOCS.

After one year of feedback, e-CODS has been proven secured, efficient, user-friendly and allowing to dramatically decrease lead time of plan approval by eliminating non-added value tasks.

With the oil price improving, has this created a climate of optimism in Nigeria?

Nigeria traditionally has relied heavily on income generated from the oil and gas industry. During this last oil downturn it became apparent that Nigeria

needed to diversify its economy, if it was going to sustain economic growth.

This proved very difficult as investment is required in other sectors in order to diversify, and with the top revenue generator, oil and gas, going through a downturn. Therefore, funding our diversification dreams became much harder.

However, now that the oil price is improving, it has created a lot of optimism in Nigeria because we now have a way of funding our diversification ambition. This can clearly be seen in this year's budget, where most of our budget is going to fund other sectors, such as agriculture and infrastructure, rather than the traditional oil and gas sector. ♦

“ During the last oil downturn, it became apparent that Nigeria needed to diversify its economy if it was going to sustain economic growth ”

CASE STUDY: A SUCCESSFUL OFFSHORE MULTIPHASE PUMP PROJECT

Multiphase pumps have been successfully used for onshore and offshore applications worldwide. The technology gained increasing acceptance among global producers for keeping marginal and declining oil fields producing, and to reduce flaring as a contribution to a cleaner environment.

THE MAJORITY OF multiphase pumps (MPP) operating are based on Twin Screw Pump Technology. These self-priming pumps are of double volute design and hence, hydraulically balanced. The possibility of speed variation by means of Variable Frequency Drives offers a wide operating envelope. Twin screw MPPs are available for flow rates up to 5,000 m³/h (755,300 bpd) and differential pressures up to 150 bar (2,175 psi). The pumps are designed to handle high Gas Volume Fractions (GVF) and to tolerate gas slugs with 100 per cent GVF.

An installation with twin screw multiphase pumps has been commissioned on a wellhead platform (WHP) off the UAE coast, where oil has been produced since the 1980s. The production from these fields is pumped from the wellhead platforms to central onshore or offshore facilities for processing, storage and export.

To sustain the field's oil production at the current level the implementation of short term development projects was initiated, which consisted of installing electrical submersible pumps (ESP) and a multiphase pump (MPP) at selected WHPs.

The engineers proposed multiphase pumps as a cost effective technology to transport multiphase fluid via a single

pipeline instead of separating oil, water and gas at gathering stations and exporting oil and gas through separate pipelines to central production facilities. Multiphase pumps are essentially a means of adding energy to the unprocessed well stream, which enables liquid/gas mixtures to be transported over longer distances without the need for prior phase separation.

Pumping the multiphase fluid directly to the central processing facility eliminates the requirement for separators, heater treaters, pumps, compressors and storage tanks at the in-field gathering stations and offers the following advantages: Reduction of installation space requirements due to less equipment; Reduction of operation and maintenance interfaces due to less equipment; Reduction of manpower due to the fact that MPP installations are suitable for remote control and require no permanent manning.

Further arguments for multiphase pump technology are:

- ♦ De-bottlenecking of existing flow lines by maximising the throughput.
- ♦ Integration of low and medium pressure wells into a high pressure manifold/separator.
- ♦ Integration of marginal fields or remote tie-backs to existing facilities.
- ♦ Segregated production schemes of medium and low

Technology can be used to reduce flaring.



Image Credit: Blondinhard Fröberg/Flickr

pressure wells by using dedicated multiphase pumps.

- ♦ Production restoration of dead wells by reduction of the well back pressure.
- ♦ Maximum utilisation of existing production facilities on a declining field by adding production from remote wells.
- ♦ Elimination of flaring and gas recovery by boosting the unprocessed well stream to central separation facility.
- ♦ Reduction of unstable flow regimes in multiphase pipelines to higher superficial velocities.
- ♦ MPPs are designed to operate with variable suction pressures. This is an advantage over conventional separation systems featuring compressors which are designed to operate solely at a pre-determined fixed inlet pressure level.

For the installation of the multiphase pump the operators chose production facilities on a

WHP with six wells. There were three low pressure wells intermittently flowing or not flowing at all due to the high pressure from the remaining wells into the common manifold. Therefore, it was considered technically and commercially feasible to install a multiphase pump at the WHP connecting the low pressure wells.

The MPP system which is now installed on the WHP consists of:

- ♦ The pump skid with the MPP, the electric motor, the lube and seal oil system, an automatic filter, the liquid management system, the on-skid piping with motor operated valves and the on-skid instrumentation.
- ♦ The air conditioned and pressurised control container for the VFD, PLC etc.
- ♦ The transformer
- ♦ The low voltage distribution board. ♦



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OPTIMISM ABOUNDS FOR THE NIGERIAN OIL AND GAS INDUSTRY

Taiwo Togun, chief operating officer, Prime Atlantic Group, talks to *Oil Review Africa* about the company's major achievements, including a certified training programme for offshore workers, which has helped more than 800 people so far.

Please tell us more about Prime Atlantic Cegelec.

Prime Atlantic Cegelec is a partnership between Prime Atlantic Nigeria Limited and Vinci Energies Oil & Gas (previously Cegelec). The company started in 2005 with a training center in Ogere in Ogun State to train operation and maintenance technicians for the Chevron Agbami FPSO. The joint-venture Prime Atlantic Cegelec Nigeria Limited (PACE) was created in 2007. The objective of the partnership is to deliver high standard services to the oil and gas industry leveraging Cegelec expertise and referencing Prime Atlantic's extensive knowledge as a service provider to the Nigerian Oil and Gas industry. PACE started its activities in training and soon successfully broadened its reach into maintenance and inspection of projects, execution of projects and commissioning activities.

What are some of the major projects you have executed?

Some of the major projects we have executed are the commissioning and engineering on OFON-2 wellhead platforms. On the USAN FPSO, we performed all the maintenance and inspection works during its construction, and, for the last six years, been executing the general maintenance contract which involves Instrumentation, Electrical, HVAC and Mechanical works. The maintenance expertise offered by PACE was recognised for the Egina FPSO for which PACE, with the support of Actemium Oil and Gas, mobilised 15 Engineers to Korea over three years to execute the maintenance and inspection engineering Contract for the pre-commissioning phase of the FPSO. In addition, PACE is executing the commissioning of the Egina FPSO at Ladol Nigeria, involving about 180 personnel which



Taiwo Togun, COO of Prime Atlantic Group.

comprise of engineers, supervisors and technicians.

What are some of your major achievements?

Our OPITO (Offshore Petroleum Industry Training Organisation) certified training programme. Through the programme, we have been able to contribute to the building of local competences as over 800 students have been trained to become operations and maintenance technicians for the Akpo and Agbami FPSOs. The curriculum includes extensive training in instrumentation, systems, electrical, HSE, mechanical, process and behavioral courses.

Our involvement in the successful execution of major contracts on various FPSOs in Nigeria is also significant.

Can you talk about capacity building?

The objective of PACE is to provide high level

services while building capacity locally. We have trained and certified operations and maintenance technicians who are now employed in international oil companies. PACE has also trained more than 100 commissioning technicians involved in various projects across the country. While the company started in 2007 with five Nigerian staff, 180 national employees are now contributing to its success.

Is the outlook for Nigerian oil and gas optimistic?

The plunge in the crude oil prices was a difficult time for Nigeria. However, the combination of growth of national capacity, the strong level of proven crude oil reserves and the recent increase of crude oil price has led the different stakeholders of the industry to be optimistic for the future.

What about CSR projects?

It has always been our will to give back especially to the children who represent the future. PACE has sponsored school programs by buying books, dictionaries, furniture and computers, and have also upgraded some school buildings in Lagos state and Ogun state.

What future plans does Prime Atlantic Cegelec have?

PACE wants to grow its maintenance concept and know-how in NOCs. There are a number of advantages to indicate this maintenance concept is invaluable, such as cost control, better performance and availability, safety culture, respect for the environment and local content capacity building. We strongly believe that it will ultimately be beneficial for the oil and gas industry and Nigerians. ♦

AFRICAN RIG COUNT

COUNTRY	April 2017	March 2018	April 2018	Annual change
ALGERIA	40	41	40	0.0%
ANGOLA	4	3	2	-50%
CONGO (BRAZZAVILLE)	1	2	3	200%
GABON	1	3	4	300%
KENYA	1	1	1	0.0%
LIBYA	0	0	0	N/A
NIGERIA	10	12	13	30%
SOUTH AFRICA	0	0	0	N/A
TUNISIA	0	2	2	200%
OTHER AFRICA	3	3	6	100%
AFRICA (TOTAL)	60	67	71	18.3%

Source: *EnergyEconomist.com*

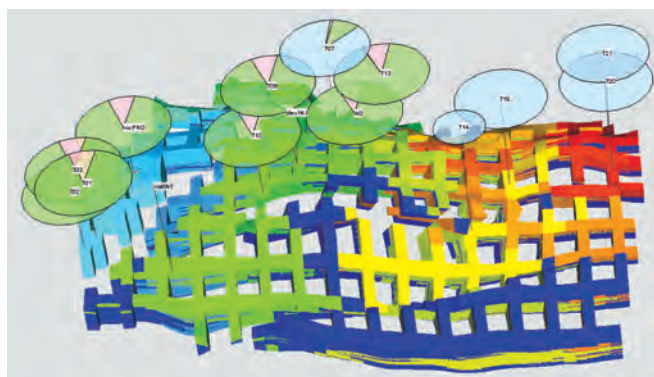
Enhanced reservoir software offers more robust risk analysis and reserves estimates for E&P operators

EMERSON HAS LAUNCHED Roxar Tempest 8.2, which is the latest version of its reservoir management software, bringing advanced uncertainty analysis tools and increased support to the Big Loop workflow and robust risk analysis and reserves estimates across the seismic to simulation workflow.

This adds to Emerson's end to end exploration & production (E&P) software portfolio, helping operators boost performance and project certainty on investment and operational goals within new and established reservoirs.

Enhancements to the Big Loop workflow within Tempest ENABLE, Emerson's uncertainty management and history matching module, centre on greater connectivity to other IT ecosystems, leading to the closer integration of geology and engineering, simpler workflow setup and improved risk and uncertainty analysis.

To this end, the system now supports the Nexus* and CMG simulators, several cluster queueing systems, such as LSF,



Better visualisation for E&P operators.

PBS and UGE, and it is easier to connect other third party and internal applications into the workflow. Post processing and analysis of the Big Loop ensembles is also now fully integrated.

Tempest MORE 8.2, the reservoir simulator, can now handle gas liquid recovery plants, enabling the calculating of liquid petroleum gas (LPG) and natural gas liquids (NGLs) production. In addition, the modelling of the physical processes for near well bore flow and for multiple simultaneous fluid types is

enhanced. All results can be visualised in the Tempest VIEW module.

The Big Loop workflow is the cornerstone of Emerson's reservoir characterisation and modelling process, tightly integrating the static and dynamic domains and propagating uncertainties from seismic characterisation through to geological modelling and simulation. Reservoir uncertainties are captured and varied as input parameters, creating an ensemble of realistic reservoir models that all feed into

the reservoir simulator. This leads to a better understanding of the reservoir geometry, more robust reserves estimations, and better-informed decisions for future field development scenarios.

Users of Tempest 8.2 may also benefit from additional post processing capabilities through Tempest VIEW. These include full support for the latest CMG simulator output, direct creation of PowerPoint presentations and improved streamline analysis and fault visualisation.

Roxar Tempest, which runs on Windows and Linux and operates alongside Emerson's reservoir characterisation and modelling solution Roxar RMS, is an integrated software suite that provides a wide range of reservoir engineering features and is used in hundreds of installations worldwide. All modules can be deployed together or separately within third-party simulation workflows.

www.emerson.com/ReservoirEngineering

Image Credit: Emerson

Project on ergonomics for offshore workers on helicopters recognised with award

THE RESULTS OF a ground-breaking project into the body sizes of UK offshore workers on board various helicopter crafts has been recognised with an award for outstanding contribution to ergonomics.

The three-month study was a joint project by Robert Gordon University (RGU) and Step Change in Safety, in response to a mandate from the Civil Aviation Authority to ensure offshore workers were sitting adjacent to windows through which they could make an emergency escape.

The project involved measuring the shoulders of a 75,000 strong workforce to establish how many were designated as 'XBR' or 'extra broad'. With these figures in mind, the team would be able to advise seating logistics which



Image Credit: Robert Gordon University

Researchers Dr Arthur Stewart, Emily Taylor and Robert Ledingham.

maximised the probability of successful escape, following concerns about window egress in an emergency situation.

Following the project's completion, the team was awarded the William Floyd Award from the Chartered Institute of Ergonomics and

Human Factors, for outstanding and innovative contributions to the field. The study was led by Dr Arthur Stewart, from RGU's School of Health Sciences, who has previously been recognised for his ongoing work into the size and shape of the North Sea offshore workforce.

Independent reservoir analysis system uses pulsed-neutron technology

PROBE, A SUPPLIER of logging and reservoir monitoring technology to the global oil and gas and geothermal industries, announced the RAS pulsed-neutron tool, a three-detector system that uses sigma and carbon-oxygen (C/O) techniques to measure reservoir fluid saturation of oil, water and gas.

The ability to accurately and reliably monitor reservoir conditions is an ongoing challenge for operators and service companies alike. For years, the industry has relied upon systems that employ pulsed

neutron technology to measure reservoir fluids behind casing and well tubulars. This technology is applied to monitor fluid contacts in the reservoir, diagnose production problems and to locate bypassed pay zones.

Full-function pulsed-neutron reservoir monitoring tools that employ sigma logging and C/O spectroscopy have been available from the major wireline service companies. "Operators and smaller wireline service companies had no alternative but to use the tools offered by a few major players," said Federico Casavantes, president and CEO of Probe. "Consequently, demand for a full-function pulsed-neutron tool from an independent supplier, that could offer the same – or better – reservoir saturation data, continued to escalate. This demand was also being driven by market dynamics which greatly favoured tool reliability, long-life and low total cost of ownership, all of which we are now able to fully address."

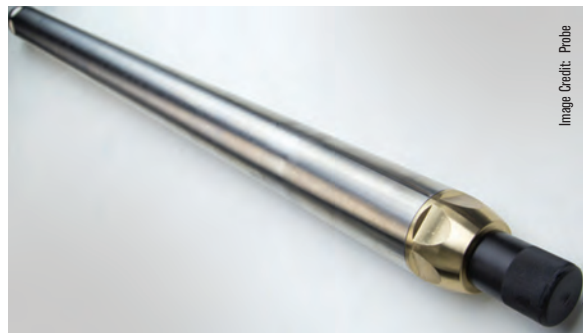


Image Credit: Probe

The pulsed-neutron tool will help in monitoring reservoir conditions.

www.probe1.com

Total's IT research for oil, gas and beyond

TOTAL HAS COMMENCED a three-way research collaboration with Stanford University's School of Earth, Energy & Environmental Sciences (Stanford Earth) and Lawrence Livermore National Laboratory (LLNL) on the FC-MAELSTROM project.

The research will focus on developing integrated algorithms and numerical methods for next-generation supercomputer architectures to advance computational engineering sciences. This project is part of Total's ambition to be among the leaders of CCUS technologies; more precisely it will help to develop a new research simulator for modeling operations in geological formations. Total's investment and expenses in this significant effort represent more than US\$20m over 5 years, supported by Total R&D.

"For Total, the spectrum of applications is very broad and corresponds to any business where operations impact subsurface," says Philippe Cordier, who is in charge of R&D Numerical programme.

One of the first identified applications of this research project is geological CO₂ storage at gigatonne scale needed to meet the 2°C scenario. Anticipating potential events is key to providing safe and acceptable operations. Total believes that the use of HPC and dedicated simulators are critical in this context. This joint research effort will constitute an opportunity to tackle this area of research. The project supports the development of a critical mass of research scientists and engineers with core competencies in applied computational science.

Latest version of Pipeline Toolbox launched in Houston

TECHNICAL TOOLBOXES HAS released Version 19.0 of its flagship product, The Pipeline Toolbox. The Pipeline Toolbox V19 features a range of improved calculations and applications, which improve the user experience, along with an embedded new license manager that strengthens security and enables visibility of The Pipeline Toolbox utility to better service client needs and identify opportunities to grow functionality within their businesses.

Drew Lafleur, chief technology officer, Technical Toolboxes, said, "The Pipeline Toolbox has been the industry standard calculation and analysis



The latest software can improve pipeline management at all project stages.

tool for the design, construction, operations and integrity of pipelines worldwide for more than 20 years. With its more than

230 unique pipeline-specific oil and gas applications and calculations, engineers, contractors, operators and

inspectors have been able to design, build and maintain today's pipelines and help deliver much needed energy and petroleum products to our growing world."

"We are guiding customers on their migration to the new platform, where they will have access to the most up-to-date industry calculations and applications," Lafleur continued. "The Pipeline Toolbox V19 will, in turn, drive the development of our next generation Digital Toolbox, where we will address much needed data, application and workflow needs in our various pipeline businesses and drive the pipeline industry well into the 21st Century."

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MEETING THE NEEDS OF CLIENTS ALONG THE ENTIRE VALUE CHAIN

Andy M. Morton, oil, gas and chemical services business manager, talks to *Oil Review Africa* about how SGS Inspection Services is working closely with upstream and downstream clients in a competitive marketplace.

What services are popular among upstream clients?

For upstream clients, the most popular services currently are M&I (metering and instrumentation) and Laboratory services. Metering and measuring services accurately measure the amount of hydrocarbons extracted and produced, and with instrumentation services, our qualified technical staff provide calibration, maintenance and overhaul services for valves, and meters to enable reliable and safe operation of hydrocarbon allocation systems.

Laboratory services, including technical support, operations management, technical staff, equipment and facility rental, are popular too. Locally, we are looking to expand our laboratory services to include sample management, reservoir fluids analysis using the pressure-volume-temperature (PVT) equipment and introduce other services, including wireline and slickline well intervention and SGS Horizon covering subsurface and engineering aspects.

What about services for downstream clients?

The biggest service by far is quality and quantity supervision and certification of custody transfers of bulk petroleum cargoes for import and export. The most common of these are offshore ship-to-ship petroleum operations where larger vessels, too big to dock in port, discharge product to smaller vessels that can offload in port. As specifications for individual products vary from location to location, laboratory analysis to ensure that the product conforms to specification is very important.

Will an increased focus on refinery-building in Nigeria help downstream business?

There will be fewer petroleum product imports and fewer crude oil exports as the refineries, once operational, will be processing



Andy M. Morton explains how to maximise value for upstream and downstream sectors.

the crude to produce petroleum products for national consumption. This should mean a reduction in historical business of quality and quantity shipping inspections. However, refinery-building will create opportunities for our other sectors such as our industrial and environment, health & safety divisions through their design, commissioning, start up and continuous operations. OGC services will evolve to incorporate innovative services such as fuel integrity and retail. These services focus on the end consumer, assuring product quality at petrol pumps.

What technology is helping you offer optimal service?

Digital communications, wi-fi, GPS

monitoring for locating vessels and samples in transit have helped optimise our service to clients. The transition from hand-written reporting and telex nominations through to desk top computers with fax machines and now on to laptops and tablets with smartphones and internet access has revolutionised the inspection industry over the past three decades.

How important is safety?

Safety is paramount. We have 15 rules for life to keep our people safe, always. These are based on the risks we have identified within the industries where we work. These rules have to be obeyed by everyone conducting work on behalf of SGS. Safety meetings are conducted at least on a weekly basis at all sites. Safety is analysed from the outset at personal and business levels via our operational integrity team and our risk management internal control strategy. We have a risk management plan in place and consider potential risks and events before they happen.

Are you optimistic with the improved oil price?

We are always optimistic. Highs and lows bring their own challenges. Our experience and proactive approach means we are constantly looking beyond customers' and society's expectations in order to deliver market leading services wherever they are needed.

We provide innovative services and solutions for every part of the oil and gas industry. Our reputation for independence, excellence and innovation have established us as the market leaders in providing services that improve efficiency, reduce risk and deliver competitive advantage. ♦



Capacity building and professional competence explains our mission



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