

Oil Review

Oil · Gas · Petrochemicals

Africa

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Going from strength to strength Ghana rising

Reducing costs for offshore operations

Gulf of Guinea regional update

Public and private sector cooperation in Uganda

Internet of Things, satellite mapping, process
automation, offshore construction and compressors



Emperor Chris Baywood Ibe,
Baywood Continental (p50)



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Find out more about developments in Ghana from page 18. (Image credit: Eni/Flickr)

EDITOR'S NOTE

OIL REVIEW AFRICA was honoured to be a media partner at the Ghana Summit. Overall, the event was upbeat with industry and government leaders buoyed by the success of the Sankofa, Jubilee and TEN projects. News of the Sankofa field starting production three months ahead of schedule provided a much-needed shot in the arm for the country's oil and gas industry. While it looks like the "lower for longer" oil price scenario is here to stay, plenty of speakers at the Ghana Summit shared their stories of how they have adapted and thrived in these challenging times. To find out more about the discussions at the summit, please turn to page 18.

In this issue, we also look at ways to reduce costs in remote offshore basins (page 22) and how the Internet of Things is helping operators save time and money, particularly in regard to maintenance costs (page 39). Other highlights of our technical pages include process automation (page 36), satellite mapping (page 38) and offshore construction (page 34).

Georgia Lewis
Managing Editor

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Lagos
www.power-nigeria.com
- 5-8 SPE Offshore Europe**
Aberdeen
www.offshore-europe.co.uk
- 11-12 Tanzania Oil & Gas Congress**
Dar es Salaam
www.cwctog.com
- 12 Oil & Gas Aviation Seminar**
Aberdeen
www.oilandgasuk.co.uk

OCTOBER

- 4-6 Powering Africa: Nigeria 2017**
Abuja
www.energynet.co.uk
- 18-20 Mozambique Gas Summit**
Maputo
www.mozambique-gas-summit.com

22-25 The Oil and Trading Logistics Expo 2017

Lagos
www.otlafrica.com

23-27 Africa Oil Week 2017

Cape Town
www.africa-oilweek.com

NOVEMBER

6-7 Practical Nigerian Content

Uyo, Akwa Ibom
www.cwcpnc.com

13-16 ADIPEC

Abu Dhabi
www.adipec.com

29-30 Gas Options North and West Africa

Morocco (City TBC)
www.energynet.co.uk

FEBRUARY-MARCH 2018

26 Feb-1 Mar Nigeria Oil & Gas Conference & Exhibition

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14-16 East Africa Oil & Gas Summit and Exhibition

Nairobi
<http://10times.com/the-east-africa-oil-and-gas-summit>

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

Energy industry leaders to converge on ADIPEC 2017

A COMBINATION OF leading speakers and a strong technical programme will again make this year's ADIPEC conference a must-attend for many oil and gas industry executives.

Held in Abu Dhabi this year from 13-16 November, the programme has been organised in collaboration with the Society of Petroleum Engineers. There have been more than 3,000 technical abstract submissions this year, with more than half coming from outside the UAE.

Christopher Hudson, President – Global Energy at dmg events, the conference organiser, said: "Driving growth in a volatile industrial sector can



ADNEC, Abu Dhabi's national exhibition centre, will once again play host to the ADIPEC event.

be challenging at the best of times. ADIPEC 2017, the world's most influential oil and gas exhibition and conference, is evolving to bring more event attendees fully into the realm of industry decision-making, from passive to active participation, and our new global downstream business leader sessions are testament to this progressive new approach to inclusion."

Among the exhibitors, Nigeria will be represented by the Nigerian Gas Association and the Nigerian Petroleum Exchange. Sudan will be represented by National Upstream Solutions. For more information, log onto www.adipec.com



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Mobil Oil Nigeria changes name to 11 Plc after US\$300mn deal

IN A NOTICE sent to the Nigerian Stock Exchange, Mobil Oil Nigeria has informed members and the investing public of its change of name from Mobil Oil Nigeria to 11 Plc.

The change of name took effect on the Nigerian Stock Exchange on 11 August 2017.

NIPCO Plc, had last year acquired a 60 per cent stake in Mobil Oil Nigeria from Exxon Mobil of the USA in a deal valued at US\$300mn.

NIPCO had indicated that the company would embark on a name change, excluding the Mobil brand of lubricants. NIPCO, had few months ago launched a Mandatory take Over (MTO) of shares held by minority owners.

Mobil, a major petroleum marketer has more than 200



Image Credit: Royaltynol/Wikimedia Commons

The familiar Mobil petrol station signage will need to be updated.

stations in Niger which will have to be repainted. In addition, the company may need to run a public relations and advertising campaign informing the public of the name change.

Half year results by the company showed a massive decline in profit before tax due to

a change in the company's pension scheme.

Mobil Oil Nigeria was incorporated as a private company in 1951, became a public limited liability company and was listed on the NSE in 1978. Year to date, the shares are down 15.8 per cent.

H1 gross and post-tax profits up for Oando

INDIGENOUS NIGERIAN ENERGY group Oando has reported increased turnover and profits for the first half of 2017, compared with the same period last year.

Turnover increased by 26 per cent, at N267.1bn compared to N212.3bn for H1 2016.

Gross profit was up by 76 per cent at N33.4bn for H1 2017, compared to N19bn in the same period last year. Post-tax profit increased by 117 per cent to N26.9bn, compared to N4.6bn.

Oando's downstream operations were more successful in the first half of the year than the upstream operations.

Downstream, Oando reported a 72 per cent improvement in revenues with more than 7Mb crude oil exported and 600,000MT of refined petroleum products imported in the first half of 2017. This represented a respective increase of 20 per cent and 96 per cent.

Upstream, production in the first half of 2017 decreased by 20 per cent to 7.2MMboe, an average of 39,950 boe/d, compared to 8.2 MMboe, an average of 44,892 boe/d, in the first half of 2016.

Oando's H1 performance took place against a backdrop of better production levels, aided by a containment of Niger Delta unrest and resumption of activity on the Trans Forcados Pipeline.

Wale Tinubu, Group Chief Executive, Oando said: "Within the prevalent crude pricing regime, we remain committed to optimising our overall production base, seeking unique profit-driven opportunities to further partner with IOCs, while firming up our balance sheet to provide greater shareholder value."

Cairn Energy exploration well yields oil and gas off the coast of Senegal

CAIRN ENERGY HAS announced positive results from the drilling of its SNE North-1 exploration well offshore Senegal, which encountered both oil and gas reserves in the primary objective.

An estimated 24m of gross hydrocarbon column had been

found across three intervals.

In addition, the well also came across 11m net condensate and gas which, said Cairn, is a high-quality reservoir in the primary objective.

In the deeper secondary objective, the well had encountered 4m net oil in a good quality reservoir. Apart from that, the SNE North-1 exploration well encountered a slightly lighter type of 35° API than the SNE Field.

A full set of oil, water and gas samples was recovered. After completing conventional logging, a series of Modular Formation Dynamic Testing mini-fracks were obtained across the reservoir

section to help calibrate the geo-mechanical model of the field and aid development well design.

According to Cairn, the SNE North-1 well result has positive implications for further hydrocarbon potential to the north of the structural trend containing the SNE field and SNE North-1 discovery well, as well as for broader exploration potential in the permit.

Simon Thomson, CEO of Cairn Energy, said, "The SNE North well results are encouraging in terms of further prospectivity and implications for the full block potential offshore Senegal. We are delighted to have completed a safe and successful drilling programme in Senegal this year with the Stena DrillMax."



Simon Thomson, Cairn Energy CEO.

Image Credit: Cairn Energy

Egypt to hold tender for desert exploration

EGYPT'S GENERAL AUTHORITY for Petroleum (EGPC) has announced it will hold a tender process for oil exploration in the country's Eastern Desert region.

The areas open for exploration include Wadi Dara, with a total area of 50 sq km, and block G in West Gharib, with an area of 20 sq km.

Bids need to be submitted to the EGPC by 28 December.

This is part of Egypt's push for the exploration and development of new oil and gas fields, as well as speeding up production at existing fields. This drive aims to reduce imports of hydrocarbons, meet the local market's increasing demand for energy, and achieve the ambition of returning to natural gas exporting in the coming years.

The importance of returning to natural gas exporter status was highlighted by the announcement by Egypt's petroleum minister, Tarek Al Mulla that the country intends to import 80 shipments of LNG on the 2017/2018 financial year. This is down from the 118 LNG shipments imported in the 2016/2017 fiscal year.

Egypt's reduced reliance on imported gas has been attributed to increased domestic production.

Egypt expects a daily increase of 1bcf in its natural gas production to reach 6.2bcf per day by the end of the 2017/2018 fiscal year. The country aims to achieve gas self-sufficiency by the end of 2018.

En, discovered gas in the Zohr offshore field in 2015 and is expected to start production by the end of this year.

Eco Atlantic to focus on oil exploration prospects in emerging Namibian market

ECO ATLANTIC OIL CEO Gil Holzman is upbeat about the prospects for oil exploration and production in Namibia, praising the country as one of the best places in Africa in which to do business.

In Namibia, Eco Atlantic holds a 32.5 per cent stake in license PEL0037, located offshore in the Walvis Basin and is the operator. Tullow Oil has farmed out 30 per cent of its 65 per cent operated interest under license to India's ONGC. Eco Atlantic's interests across four offshore petroleum licenses total approximately 25,000 sq km with more than 2.3bn barrels of prospective P50 resources in the Walvis and Lüderitz basins.

These four licenses, Cooper, Guy, Sharon and Tamar, are being developed with partners,



Image Credit: Sander/Flickr

There is better infrastructure for oil rather than gas products within Namibia.

including Tullow Oil, AziNam and NAMCOR.

Speaking exclusively to *Oil Review Africa*, Mr Holzman said Eco Atlantic is focused on oil rather than gas in Namibia.

"With 2tcf of gas, it's more of a burden without proper infrastructure [and] it's too small

for LNG," he said. Instead, Eco Atlantic has been making investments, particularly in seismic data, while prices have been low. Also, partners, such as AziNam helping to fund seismic activity. He said it has been a good time to invest, while the oil and service prices are low.

OPEC secretary general discusses challenges with Gabon's president and oil minister

OPEC SECRETARY GENERAL, Mohammad Sanusi Barkindo led a delegation to Gabon to discuss industry challenges with the country's president, Ali Bongo Ondimba, and petroleum and hydrocarbons minister, Pascal

Houangi Ambourou.

"We are passing through a difficult time and if it had not been for OPEC, it could have been much more difficult," said President Ondimba.

He emphasised the

importance of the technical assistance the country receives from OPEC members, particularly now that Gabon "has embarked on a plan to transform its oil industry" and make it more sustainable.

"I am optimistic that the market will be rebalanced – and together with the help of Gabon we will restore stability to the market," said Mr Barkindo.

Additionally, Mr Barkindo briefed the president on the decisions taken by OPEC in May to extend the adjustments for nine additional months, which started from July.

Gabon became a full member of OPEC in 1975 but then terminated its membership in 1995. It re-joined the organisation in July 2016.



Gabon's oil industry looks to OPEC members for assistance.

Zambian president and Tullow commission first oil survey in Luapula Province

ZAMBIAN PRESIDENT, EDGAR Changa Lungu and Tullow Oil have announced the country's first-ever oil survey. The full tensionometer survey will take place in Luapula Province. It aims to identify potential oil reserves in the north-west of the country and is viewed as a step towards the Zambian economy reducing its reliance on copper exports.

Zambia has launched the seventh iteration of its National Development Plan. This plan makes provisions for creating 1mn new jobs over the next five years with a view to Zambia becoming a middle-income



Image Credit: Paulo Cesar Santos/Wikimedia Commons

Could oil exploration in Luapula Province put Zambia on the road to success?

country by 2030.

The president said: "My government has set a clear agenda to diversify the economy beyond copper and to realise the

value of our other natural resources in a way which is transparent, sustainable and delivers positive impact for Zambians."

West African refineries benefit from high margins

HIGH REFINERY PROFITS have helped West African oil producers sell cargoes quickly. This boom has been aided by a shortage of certain types of crude oil as a result of OPEC production cuts and ongoing problems in Venezuela, Reuters reports. Demand for sour crude has assisted the Angolan market, while Nigeria has exported its low-sulphur sour crude oil to the United States and Asia, with refineries running on strong margins.

US Trade and Development Agency to support Mozambique in 78MW gas-fired power plant project

THE US TRADE and Development Agency held a grant signing ceremony on 10 August 2017, at the African Growth and Opportunity Act (AGOA) forum to support a greenfield 78MW gas-fired power plant in Mozambique.

The agency awarded the grant to Kuikila Investments, an independent power developer in Mozambique. This grant will fund a feasibility study for the

power plant, which is slated to be built in the Chokwé District of the country's Gaza province.

This represents another step forward in the development of the emerging gas industry in Mozambique, which has the third-largest gas reserves in Africa, at an estimated 180tcf.

As well as being an opportunity for Mozambique to meet its energy needs and modernise power generation and

infrastructure, the country's gas development could present strong export opportunities for US industry.

"USTDA's support will enable Mozambique to get domestic gas-fired power projects online expeditiously," said USTDA's acting director Thomas R. Hardy. "At the same time, the project creates opportunities for a significant amount of US equipment exports. We are pleased to cooperate on this important initiative."

Kuikila Investments has selected Washington DC-based Delphos International, an independent financial services firm, to undertake the feasibility study.

"Kuikila has been working with the government of Mozambique for five years on various gas-fired thermal power plants supporting the country's development through reliable and affordable power," said Diogo Vaz

Guedes, chairman and CEO of Kuikila. "This grant represents an affirmation of our efforts. We are pleased to partner with USTDA and Delphos to accelerate the process of getting this project to financial close."

Additionally, oil majors Eni and Anadarko are progressing with plans to build LNG terminals in Mozambique, following on from a joint agreement, which was signed by the two companies in late 2015.

This agreement requires the companies to develop adjacent offshore gas fields in the Rovuma Basin.

Under the terms, Eni and Anadarko will each develop their own terminals. The combined capacity is projected at about 15mtpa.

The companies have also signed an agreement with the Mozambique government in regard to the use of marine facilities.



Offshore gas development could help Mozambique meet its power needs.

Image Credit: Maurits and Marjol/Wikimedia Commons



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Nigerian senate leader promises swift passage of Petroleum Industry Bill

IN A PROMISING development for the passage of the long-awaited Nigerian Petroleum Industry Bill (PIB), the leader of the country's senate has indicated that it will be a priority after the parliamentary recess. Parliament will resume in September.

Yusuf Olaniyonu, special adviser (media and publicity) to Bukola Saraki, president of the senate, released a statement that said the passage of administrative and fiscal policy bills for the petroleum industry will be among the important issues for the senate. The senate's current term lasts less than two years.

In the statement, Mr Saraki said the host community component of the PIB, which examines ecological debt in communities where petroleum exploration takes place, and



Security and community protection will be priorities for the final PIB.

community participation and security, will be major priorities for the senate.

"This is something Nigerians can watch out for. Similarly, the Industry Administration component of the PIB, which seeks to open up the industry to

investment and growth, as well as create the much-needed expansion of the industry by allowing new entrants into the operations of the industry, is now at the committee stage at the Senate. We will work to quickly pass the bill," said Mr Saraki.

Total and CNOOC to partner at Uganda event

TOTAL AND CNOOC have confirmed their support for the 3rd Uganda International Oil & Gas Summit (UIOGS) 2017, partnering as lead sponsors and co-hosts to the event on 27 September in Kampala. Uganda has more than 21 hydrocarbon discoveries, 87 oil wells drilled and 21 fields.

"Following the undoubted success of the last two summits in attracting international investors from around the world, UIOGS has become a major business platform for oil and gas in Uganda where all the decision makers for the region are united for three days' high level discussions and networking," said Irene Muloni, minister of energy.

Maggy Shino to receive major women's award at petroleum and energy industry event in Cape Town

THE GLOBAL WOMEN Petroleum & Energy Club Luncheon has become a much-anticipated feature of the hydrocarbon events calendar. It will be part of Africa Oil Week, the ninth of these luncheons will be held in Cape Town on 25 October 2017. This year, the Global Women Petroleum & Energy Club Award for Africa 2017 will be presented to Maggy Shino, Petroleum Commissioner at the Ministry of Mines and Energy, Namibia.

Mrs Shino heads the Exploration, Production and Promotion division within the Petroleum Directorate of the Namibian Ministry of Mines and Energy. She has 10 years' experience in the exploration and

production sector of the oil and gas industry and two years' experience in renewable energy. Her role as the Petroleum Commissioner involves the promotion of oil and gas investments, negotiating

petroleum agreements, issuing licenses and administration of the Petroleum Exploration and Production Act. Mrs Shino has served as a board member of Namibia's Petroleum Training and Education Fund (Petrofund)

since 2012. She holds a Masters degree in Petroleum Geochemistry from the University of Newcastle, a BSc degree in Biology and Chemistry from the University of Namibia and a diploma in Upstream Management of Petroleum Development and Operations from PETRAD, Norway.

The guest speaker at the luncheon will be Donna Shodipo, Partner, Energy and Project Finance, for Adepetun Caxton-Martins Agbor & Segun (ACAS-Law). Based in Lagos, she has more than 12 years experience in legal practice. Ms Shodipo graduated in 2000 from the University of Ilorin with an LLB Honours degree and admitted to the Nigerian bar in 2002.



The last Global Women Petroleum and Energy luncheon was very well-attended.

A large-scale industrial facility, likely a gas treatment plant, is shown at night. The scene is filled with numerous tall distillation columns, complex piping systems, and structural steel frameworks. The entire complex is illuminated by a warm, yellowish-orange glow from various lights, creating a high-contrast scene against the dark night sky. The perspective is from an elevated position, looking down into the facility.

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Victoria Oil & Gas releases positive report on Cameroonian operations

VICTORIA OIL & Gas has released an upbeat Q2 2017 report with increases in gross average gas production and gross gas sales, compared with Q2 last year.

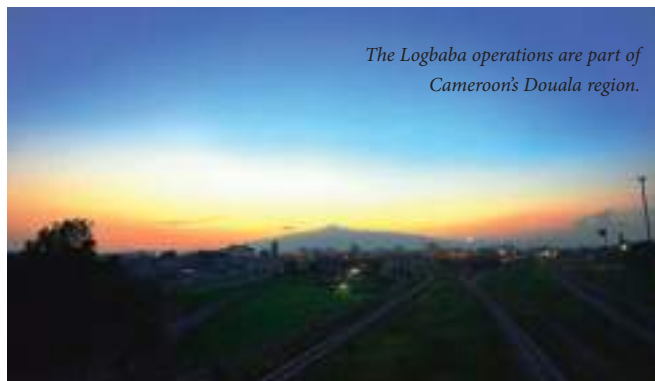
There was an 11.9 per cent increase in gross average gas production from Logbaba to 14.59mmscf/d. In Q2 2016, production was at 13.04mmscf/d.

Gross Logbaba gas sales increased to 1,192mmscf for the quarter, compared with 1,151mmscf for the same period in 2016.

The company also reported significant activity in regard to two drilling wells.

Completion, flow testing and network supply input at well La-107 is scheduled for Q3 2017.

Well La-107, as of 30 July 2017, has been drilled to 2,914m measured depth, and 2,901m total vertical depth (TVD) and a



The Logbaba operations are part of Cameroon's Douala region.

7-inch liner has been run to 2,440m (2,426m TVD) and cemented in place.

Well La-107 has, to date, encountered a net pay of 35m of high permeability, high porosity gas bearing sands in the Upper Logbaba Formation, slightly more than was expected, based on the La-104 logs. Preliminary results indicate that a further

15m of net gas sand has been encountered in La-107 in the Lower Logbaba Formation.

Engineering design work has been completed to allow La-108 to be side-tracked, through the Logbaba Formation, to access the 100m of gas sands found in the original La-108 wellbore. Drilling will commence after the completion of La-107.

Angola ministry releases oil export report

ACCORDING TO A report released in August by the Angolan Ministry of Finance, the country sold barrels of oil at an average price of US\$44.528 per barrel in June.

Data from the report indicates there was a drop of 2.03mn barrels of oil exported in June, compared to May, when 50.49mn barrels were exported.

Despite this drop, oil revenues for June were up slightly on May. In June, Angola's oil revenues totalled AKZ124.9bn.

This total was based on revenues from taxes on petroleum income, petroleum production, petroleum transactions and from the 12 NOCs which operate in Angola.

Government and industry collaboration essential for Tanzania's oil and gas market

TANZANIA IS EXPECTED to be a leading light in the east African hydrocarbons marketplace, and cooperation between government and industry is largely considered to be an integral part of this process.

Leading the government representatives at the Tanzania Oil and Gas Congress, to be held in Dar es Salaam from 11-12 September, will be Her Excellency, Samia Suluhu Hassan, vice president of Tanzania. Multiple ministries will be represented with top-level speakers at the event, including Industry, Trade and Investment; Lands, Water, Energy And Environment; Energy and Minerals, Union and Environment, Finance and



Tanzania has great ambitions for its oil and gas market as part of its development programme.

Planning; Foreign Affairs; Transport and Communication; and Lands, Housing and Human Settlement.

Additionally, government agencies, such as the Petroleum

Development Corporation, the Petroleum Upstream Regulatory Authority, and the National Economic Empowerment Council will all be represented.

Private companies represented include: Total E&P; Synergy One; Clyde & Co; and PanAfrican Energy Tanzania. For more information, log on to www.cwctog.com

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Nigerian government urges Dangote to complete refinery before 2019

THE NIGERIAN FEDERAL government has urged Aliko Dangote, president of Dangote group, to complete his crude oil refinery by December 2019. The government said it relies heavily on the Dangote refinery to fulfill its promise to Nigerians to end fuel importation by December 2019.

The Minister of State for Petroleum Resources, Ibe Kachikwu, made this statement during his visit to the Dangote oil refinery site at Lekki Free Trade Zone, in Lagos. He said that the government is ready to play its part in making sure the project is completed before the scheduled date. He explained that the present government had always believed that the private sector holds the ace in industrialisation efforts of the government, and noted that the belief has been reinforced by what Dangote Group is doing.

"It is good to say that the private sector is the answer to Nigeria's problems with a project as big as this. The challenge I will give you today is that of time; I see your time for completion is 2019 December, but I am sure

you will understand my greed if I tell you that the refinery component of this project should come earlier than the set date.

"I have made very firm commitment to Nigerians that I must stop the importation of petroleum products by 2019 and I am going to keep to it. It is absolutely important that we do this early and given the feat that we have achieved in terms of speed of construction, I urge you to do all within you to achieve its completion before the due date."

In his response to the government's challenge, Aliko Dangote, president of Dangote Group said he has accepted the challenge and would do all possible to achieve the feat. "On the honourable minister's challenge, we are going to make it by the grace of God. I am sure the minister will support us to make sure that we meet his challenge," he said.

The Dangote group is building the world's largest single line refinery, petrochemical complex, and the world's second largest urea fertiliser plant. The refinery, according to Dangote, will have the capacity to refine 650,000 bpd of



Image Credit: Wikimedia Commons

Dangote has accepted the challenge of completing the project by December 2019.

crude oil. The petrochemical plant will produce 780 KTPA polypropylene and 500 KTPA of polyethylene, while the fertiliser project will produce 3.0 mmt per annum of urea.

In his welcome address, Dangote said, "We will be adding value to our economy as all these projects will be creating about 4,000 direct and 145,000 indirect jobs. We will also save over US\$7.5bn for Nigeria annually, through import substitution and generate an additional US\$5.5bn per annum through exports of the refined petroleum products, fertiliser and petrochemicals. We envisage that these projects, which would cost over US\$18bn, would be completed in 2019."

NNPC optimistic about oil exploration and gas at SPE NAICE

DR MAIKANTI KACALLA Baru, group managing director of NNPC, spoke at the opening ceremony of the SPE NAICE 2017 event, held from 31 July-2 August in Lagos. His address focused on the theme of this year's conference, "Riding the waves of boom and bust: Common objectives, diverse perspectives".

"We can say that a common objective for a business venture is profit, profit and more profit. Interestingly, profit in itself may differ in

meaning to different people. How can a company maximise profit in a cyclic oil and gas industry?" he asked the conference.

"Despite the low oil prices, we are taking a long term view on profitability and investment on behalf of the Federal Government in oil exploration activities in the Benue Trough and Chad Basin," Dr Baru said. "This is part of Government's plan for reserve growth as well as the opening up of alternative sources for hydrocarbon exploitation."

He was upbeat about the hydrocarbons industry's economic outlook: "I'm delighted to say that the economic picture is changing now. The government has pronounced its exit from cash call arrangements with the commitment of settling all funding arrears."

On the exploration front, Dr Baru cited the discovery announced by ExxonMobil in the offshore Owowo field, estimated at between 500mn and 1bn barrels, as an example of "very promising news indicating that some of our producers are still committed to exploration efforts."

In regard to the gas sector, Dr Baru said the "strategic plan for gas is to deliver 5bscf/d to the domestic market by 2020."

"To be clear, NNPC definitely doesn't intend to lose focus on retaining and expanding the Nigerian share of the global market."

Along with physical infrastructure, commercial frameworks are being put in place to support the growth of the domestic gas market" he said. "Progress has also been made in the reduction of flared gas volumes from a peak of 2.5bscf/d a couple of years ago to about a current volume of 700MMscf/d."



Image Credit: Stuart Rankin/Flickr

An aerial shot of Lake Chad, where oil exploration is taking place.



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Uganda to develop oil refinery in Hoima district

UGANDA HAS SELECTED a consortium including General Electric (GE) and Italy's Saipem to build and operate a 60,000 bpd oil refinery plant in Hoima district in the western part of the country.

In a statement to Bloomberg, the Ministry of Energy in Uganda said that the proposed refinery will process crude from fields that are being developed by France's Total SA, China's CNOOC and the UK's Tullow Oil Plc.

After the country's initial negotiation with Russia's RT Global Resources and South Korea's SK Engineering & Construction fell through for developing the US\$4bn project, Uganda initiated the selection process. According to the source, the Albertine Graben Refinery Consortium competed with 40 other companies to be selected by the Ugandan government.

The consortium also includes Yaatra Ventures LLC and Intracontinent Asset Holdings Ltd.



Image Credit: Tisaudio/Shutterstock

The oil refinery in Hoima is expected to boost petrochemical and related industries in the country.

With GE acquiring Baker Hughes and Saipem's extensive experience in the field for more than 50 years, the project is expected to face low priority risk for its completion, according to industry experts.

Alan Gelder, vice-president of refining, chemicals and oil markets at consultants Wood Mackenzie, said to the source, "The risk to the project getting delivered is smaller because those companies are both

very good at what they do."

"The consortium has proposed to government a financing approach and a path to establish, develop and operate a commercially viable refinery company with a strategic benefit to the country and the region," said the ministry statement.

The Uganda government hopes to conclude an agreement for the project framework in next two months.

Tullow sees positive H1 performance

TULLOW OIL HAS announced its financial results for H1 2017.

The results showed revenue of US\$800mn and gross profit of US\$300mn. The company's net debt has been reduced by US\$1bn since year-end to US\$3.8bn following generation of free cash flow in April 2017. The 2017 capex guidance is cut from US\$500mn to US\$400mn. Tullow aims to reduce it to US\$300mn after the Uganda farm-down.

Paul McDade, CEO of Tullow, said, "Despite continued challenging market conditions, Tullow performed well in the first half of 2017, delivering strong revenues and organic free cash flow. Combined with the rights issue completed in April, this has allowed us to retain operational and financial flexibility and reduce our debt during the first half by around US\$1bn."

Mozambique's first deepwater gasfield development to be discussed at October summit in Maputo

THE ANNOUNCEMENT LAST month from Eni and the Mozambican Government on signing the Coral South floating LNG facility became the first of its kind for the African nation. This marks the start of an implementation phase for the gas industry of Mozambique. With more such deals expected to move from planning phase into fruition, the economy should see the benefits from this new business.

The 4th edition of the Mozambique Gas Summit & Exhibition taking place in October will extensively cover the latest developments in

Mozambique's gas industry. Organised by acclaimed oil and gas events company, the CWC Group, in partnership with Mozambique's national hydrocarbon's company ENH, attendees can expect to get the full update on the Coral South FLNG project from the country's senior decision makers.

Announcing the official support of the Summit, HE Leticia Deusina da Silva Klemens, Minister of Mineral Resources and Energy of Mozambique said: "I am delighted to announce the official support of the Ministry of Mineral Resources and Energy of Mozambique for the 4th Mozambique Gas Summit, taking place on 18-20 October in Maputo. This important Summit is organised by CWC Group in partnership with ENH [...] will provide a key platform for leading Mozambican decision makers to engage with international and local investors to discuss the abundant opportunities available. There will be an exciting focus on the implementation of the gas and LNG projects and the important position that Mozambique will play as key global gas and LNG producer. I look forward to officially opening the Mozambique Gas Summit and to welcoming you all to this prestigious event in Maputo."

For more information, log onto www.mozambique-gas-summit.com



Last year's summit was very successful.

Image Credit: CWC



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A YOUNG INDUSTRY MAKING PROGRESS: AN UPDATE ON GHANA

Ghana's oil and gas industry has made great strides, particularly in the last decade. However, the industry has faced challenges along the way. Alexander Sarac from BLP comments on the current state of play and *Oil Review Africa* editor, Georgia Lewis, reports on the Ghana Summit.

Ghana: An overview

Alexander Sarac, partner, projects, energy and infrastructure finance, BLP comments on Ghana's oil and gas industry:

Efforts to commercialise Ghana's oil industry began with the establishment of the state-owned Ghana National Petroleum Company (GNPC) in 1983. After a decade of failed exploration, the Jubilee Field was discovered in 2007 by the GNPC in partnership with Tullow, Kosmos and Anadarko. The Jubilee Field has estimated recoverable resources of up to 1bn barrels, and raised the expectations of stakeholders and consumers alike of the petroleum sector's role as an engine for economic growth.

Technical challenges have continually prevented the Jubilee Field from reaching its expected production of 120,000 bpd. In July 2015, Jubilee's production was almost halved because of problems with gas compression on a floating storage and offloading vessel.

However, since the initial commercial discovery, 24 additional minor fields have now been discovered and, most importantly, the TEN Field and Sankofa Field are currently being developed. Despite Ghana being a small hydrocarbons producer, the TEN Project and Sankofa Project are expected to significantly boost Ghana's oil



Image Credit: Eni/Flickr

Eni staff on the Offshore Cape Three Points rig in the Sankofa field. Production has started three months early.

and gas production by 2020.

Oil first flowed from the TEN Field in August 2016 and it is now Ghana's second major oil development with a facility capacity of 80,000 bpd.

The Sankofa Project is being developed by Vitol and Eni in partnership with the GNPC and

it has started production three months early. It is hoped that this project will provide 10,000 bpd by 2019. New output from TEN and Sankofa are expected to increase Ghana's crude oil and liquids production to 242,000 bpd by the end of 2020. The importance of these two fields

has been further elevated following an announcement from Tullow Oil that the Jubilee operations will be closed for a number of months throughout 2017 for maintenance, off the back of repeated technical failures.

While there are plentiful resources in the Ghanaian basin and further underexplored acreage, the Ghanaian oil and gas sector is, in effect, only 10 years old with weak mid- and downstream sectors. Despite the abundance of hydrocarbons, due to the lack of mid and downstream infrastructure

“ While there are plentiful resources in the Ghanaian basin and underexplored acreage, the mid- and downstream sectors are underdeveloped ”



Cutting of the 25th Anniversary Cake.

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capacity and capability, Ghana is reliant on energy imports. For example, even when operating at full capacity, Tema Oil Refinery can only meet 60 per cent of the domestic needs, the remaining 40 per cent must come from importation.

Due to the relative infancy of the industry in Ghana, and in general the international nature of the global upstream industries, domestic companies do not have all the necessary financial and technical experience, or strength required to exploit the upstream potential. However, there is a legal local content requirement that up to 90 per cent of the equity of companies in certain portions of the oil and gas industry must be held by domestic Ghanaian firms. This approach seems to hamper and not foster some developments in certain areas of the industry. While the government has been encouraging joint-venture arrangements with foreign partners which can provide needed know-how and technology, the government should acknowledge that the lack of specialised and well equipped local companies cannot immediately be overcome by enforcing overly restrictive joint venture arrangements that negatively affect the competitiveness of oil and gas developments in Ghana in the global context.

It seems that the government has acknowledged some of the challenges and inefficiencies in recent policy statements, but it will depend on the political will and practicality to address these and implement improvements to keep up the momentum for the oil and gas industry.

The Ghana Summit

At this year's Ghana Summit, the mood was upbeat, with the theme of this year's conference being "Ensuring sustainability in the oil and gas sector to drive economic development",



It is hoped that Ghana's agriculture sector will benefit from an improved oil and gas industry.

Image Credit: Conflict & Development at Texas A&M Flickr

Representing President Nana Akufo-Addo, Boake Agyarko, Minister of Energy, outlined three strategies for developing the oil and gas industry sustainably "to move from a tax-driven economy to a production-driven economy ... formalisation of our national economy to reach the huge informal sectors [and] to remove the obstacles that impede the efficient functioning of the market".

Representing Dr KK Sarpong, CEO of the Ghana National Petroleum Corporation (GNPC), Comfort Anigyei, the director of finance for GNPC, echoed Mr Agyarko's sentiments that the Ghanaian oil and gas industry must help the whole population in the long term: "The oil and gas sector must evolve so that it benefits not just the current generation but the generations yet unborn."

Mrs Anigyei described GNPC as "an enabler, contributing to sustainable development". She said John D. Rockefeller's famous quote about succeeding by getting up early, working hard and striking oil reflected the Ghanaian experience, with oil exploration first taking place in 1896, as well as a period of offshore

exploration from 1970 until 1984, before the establishment of GNPC in 1985. Work which was done before the big Jubilee discovery of 2007 left Ghana with a "treasure trove of seismic data", she told the conference.

The growth of gas

Natural gas is envisaged to play a leading role in energy generation for Ghana as well as being a major export, according to Mr Agyarko. He said that focusing on meeting local energy needs should boost other industries, such as infrastructure development and agriculture.

"We must not become another enclave of resource exploitation dominated by

foreign interests," Mr Agyarko warned delegates. "The theory of future preference is that the future can and will be better than the present and we have a responsibility for making it so."

Theo Ahwireng, CEO of the Petroleum Commission, Ghana's regulatory body for upstream oil and gas, said: "Gas will be piped along the western corridor [to] bring gas and restore power [and it is] fantastic to be able to do this without flaring."

Attracting investment

Attracting investment is another priority, according to Mr Ahwireng. He is confident of this as long as the richness of Ghana's hydrocarbons deposits are properly promoted. He said that when he first started working in the oil and gas industry, there was a 10 per cent success rate with wells drilled but in many Ghanaian projects, this is now at 100 per cent.

Working to ensure the oil and gas industry does not negatively impact on other industries, such as fishing, is important, Mr Ahwireng said. He cited the Norwegian model, in which hydrocarbons projects and fisheries successfully co-exist while both being profitable. ♦

Ghana is seeking to move from a tax-driven economy to a production-driven economy with obstacles to an efficient, functioning market removed



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REDUCING COSTS FOR OFFSHORE OPERATIONS

Offshore operations are potentially lucrative but can be challenging to run efficiently. With plenty of hydrocarbons operations in various stages of development off African coastlines, Kent Massey advises on how operators can reduce costs without compromise.

CENTRAL AND EAST
Africa has several hydrocarbon containing rift basins which make up a large landlocked area, covering tens of thousands of square kilometres with significant estimated oil reserves. A number of operators have started developing discoveries. But logistics, oil composition, technology and power requirements can present challenges and significantly impact on development costs.

“Large distances between reservoirs and the coast and various types of oil can present transport challenges to operators”

Logistics issues

One of the main issues common to all remote projects is the difficulty of exporting the oil. First, there is the large distance between the reservoirs and the coast. The second challenge is the type of oil which, again, tends to be similar throughout the region with an API of 30°-35°. This is positive in that it is light, but the crude has a long waxy tail of up

Offshore operations are complex and this presents several logistical challenges.



Image Credit: Xodus

to 40 per cent wax. This has a clear impact on the surface facilities and export solution, as every time the oil cools, wax is formed, creating transportation and processing challenges.

In Uganda and Kenya, heated pipelines stretching nearly 800km are currently being proposed, which brings a hefty price tag to overall project costs. This means the operator must find sufficient

oil in any location to justify the exploration, lift and transport costs and also why it takes a long time for projects to mature.

The developments are also limited by tight logistic envelopes affecting equipment selection and vessel sizes, which results in multi-trained facilities impacting cost.

A waxy problem

Electric submersible pumps and progressing cavity pumps are often required in Africa's onshore basins because many of the reservoirs are under pressured. This, coupled with the waxy nature of the oil, presents interesting flow assurance issues in terms of emulsification and transportation. The fields can have high water cuts and potentially produce stable emulsions. Xodus is supporting these developments with wax deposition and emulsion models to understand where and to what extent wax/emulsions form, and whether remediation is required depending on the flow regime. To deal with the wax, chemicals can be used or technologies such as electrical heat tracing, hot water or flushing systems can be adopted. The team looks at what is appropriate for the field, working closely with the vendors to understand the limits of the technology, and the operators' production technology teams along with independent chemical labs to offer the best solution.

Reducing drilling costs

Xodus understands drilling, subsurface, flow assurance and facilities design and is well placed to optimise well pads in order to reduce drilling costs. Some of the reservoirs are characterised by fairly low productivity wells, so a large number of wells are needed to get the flow rates required to meet the economic criteria for export routes.

When drilling hundreds of wells, minimising well costs needs to be a top priority. Batch drilling, where the drilling contractor can move quickly from well to well without directing the drilling derrick, is key to lowering costs.

Traditionally, operators would be forced to disassemble a rig, however batch drilling on multi-well pads enables the operator to have both a rig drilling and also a completion rig following up, to deliver much needed efficiencies. Xodus is designing well pads to facilitate batch drilling using common drill pits for drilling

“ Heat exchangers, which are commonly used in the Arctic to prevent wax formation can be used in Africa”



Image Credit: Xodus

The author, Kent Massey, offers detailed advice for Africa's offshore operators.

muds and drilling cuttings. This allows the operator to drill up to 12 wells with one set of cellars. It is also important that the wells can be worked over economically. Xodus has created sunken cellar designs that allow the various production, drilling and workover operations to take place simultaneously. The company has also created innovative designs for well testing which minimises the amount of equipment needed at the well pads.

Using Arctic equipment in Africa

Due to requirements for artificial lift and crude heating, operators face high power costs. Optimising power generation is critical to get efficient facilities design. Up to 50 per cent of facilities costs can come from

power generation. Interestingly, Xodus is recommending Arctic equipment to solve some of the flow issues in Africa. The oil can have a wax appearance temperature of around 70°C with pour points (where the oil stops flowing) at around 45°C. Even though the reservoir is on the equator, the ambient temperature is still not hot enough. Clever solutions have been introduced, such as heat exchangers more commonly designed for the Arctic, to prevent liquids cooling too much and forming wax.

Local content

While World Bank involvement in a number of developments has smoothed the regulatory process, there are still significant social issues to consider. These developments do not always

equate to creating local, skilled jobs, as these fields are home to many nomadic tribes, and upskilling can be difficult to do within the project timeframes. This can mean importing a large workforce into the area, creating local tensions. ♦

Kent Massey is study manager for Xodus Oil and Gas Consulting. Xodus has been involved in supporting exploration and onshore greenfield developments for several years, which have included fields in Uganda, Somalia, Kenya and Chad. This unique field development design experience enables Xodus to advise on both the subsurface and surface infrastructure, together with low-cost drilling technologies that can facilitate economic production. www.xodusgroup.com



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In these challenging times, offshore operators need to reduce costs without sacrificing quality or safety.

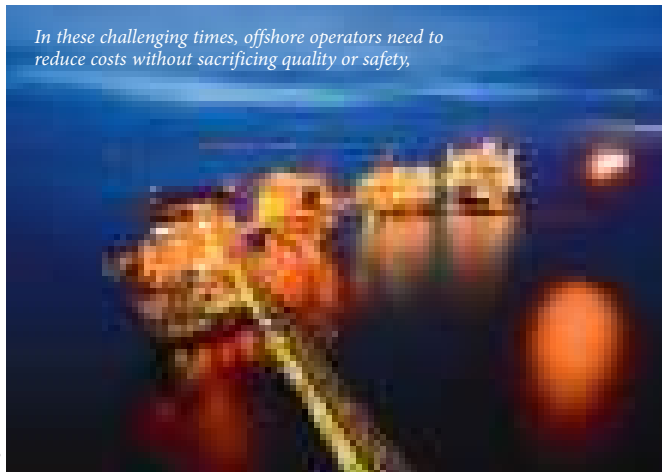


Image Credit: Xodus

Fortune Global meets a major transportation challenge for Total Egina's FPSO project

FORTUNE GLOBAL HAS been involved in a complex transportation project for the Nigerian hydrocarbons industry.

The company led the way in the handling and management of the design, planning and execution of the transportation of riser porch steel structures weighing 20,000 tonnes from the Nigerdock Free Zone to SHI-MCI/Ladol Free Zone for the high-profile OML 130 Total Egina FPSO Project.

This feat was achieved in collaboration with SAL Heavy Lift GMBH. The project team comprised industry experts, engineers and project analysts, who worked together to ensure that the project turned out to be a huge success.

As well as successfully transporting a significantly large load, the project was completed six days before the designated deadline.

It was not a simple project, involving many steps in terms of both administration as well



Fortune Global has mastered a major logistical feat.

as the practicalities of the transportation process. Indeed, the documentation stage is as critical as the physical transportation. According to the company website: "Full compliance with export documentation requirements and regulatory procedures will go a considerable distance in saving time, cutting cost and increasing profitability."

Fortune Global met all demands, from heavy lift vessel chartering; inward and

outward clearance of the vessel – including coastal movements clearance; obtaining of the Temporary Import (TI) permit, registration, and cancellation of TI; the drawing up of a stowage plan with engineering drawing; devising a sea fastening/lashing design; vessel mooring analysis POL and POD Cargo clearance and documentation; as well as the handling of many other regulatory requirements; stevedoring; project evaluation and reporting.

When it comes to getting logistics right, the company website advises choosing the right equipment, effectively arranging for the smartes, and most cost-effective, solutions, and being smart when negotiating freight rates.

"Transportation is one important aspect of logistics that may require a large one-time investment, but it will yield good returns," the website says.

www.fglobalshipping.com

Image Credit: Fortune Global

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MIXED NEWS FOR THE HYDROCARBONS PLAYERS IN THE GULF OF GUINEA

The countries which have coastlines on the Gulf of Guinea vary, from established hydrocarbons players to newcomers, to those with an industry that has fluctuated over the years. *Oil Review Africa* editor, Georgia Lewis, reports on the state of play across the region.

WHILE ANGOLA, GHANA and Nigeria dominate the headlines in terms of oil and gas development in the enormous Gulf of Guinea region, there is great potential in the oil and gas industries of Benin, Cameroon, Congo-Brazzaville, the Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon, Sao Tome and Principe, and Togo. The planned West African pipeline, slated to run from Nigeria to Côte d'Ivoire will benefit Togo and Benin.

Benin has been an oil producer since 1982, but over the intervening years, oil production has risen and fallen. While the All Progressives Congress-led government is looking to diversify the country's economy, especially in the wake of falling oil prices, hope for new oil and gas revenues may come in the form of the Keta-Togo-Benin (KTB) Basin, which extends across offshore and onshore Benin and Togo, as well as Nigeria and Ghana. Previously, low volumes of hydrocarbons were discovered in the KTB Basin, but Nigeria's 2013 Ogo discovery has renewed interest in the region.

Conversely, Sao Tome and Principe is looking to reduce its reliance on foreign aid and cocoa exports by exploiting offshore oil reserves.

Victoria Oil & Gas (VOG) and Bowleven are two leaders in

Cameroon is a more established player in the region. This is an oil spill preparedness exercise which took place in 2014.



Image Credit: International Maritime Organization/Flickr

the hydrocarbons industry for Cameroon. A farm-out agreement has been reached between Bowleven and VOG for a production sharing contract (PSC) for the Bomono Block, Cameroon. The Bomono permit is located in the onshore extension of the Douala Basin and is characterised by numerous surface oil seeps as well as a strong gas presence. It is largely unexplored.

Gaz du Cameroun Bomono (GDC Bomono), which is a wholly owned subsidiary of VOG, will take an 80 per cent stake in the Bomono PSC, with Bowleven's subsidiary EurOil keeping the remaining 20 per cent share and continuing as operator. Gas from the PSC will be sold to GDC minus a tolling fee. The gas price paid will be a weighted average received by GDC for its total domestic sales less a tolling fee for use of the pipeline network, with the pipeline connection from

Bomono to the main network managed and funded by GDC.

Additionally, Cameroon's government has signed an agreement with VOG for the Logbaba project. The gas and power project will serve the city of Douala.

According to the BP Energy Outlook 2017, Equatorial Guinea has 1.1bn barrels of provable oil reserves, Gabon has 2bn barrels and the DRC has 1.6bn barrels. Equatorial Guinea remains one of Africa's largest oil producers and exports of oil and gas are essential to the country's economic growth. Last year, the government launched an oil and gas blocks licensing round. Gas development continues apace with a final investment decision expected soon on Fortuna FLNG, Africa's first deepwater independent FLNG project.

For Gabon, the majority of the oil output - more than 90 per cent - has been exported, mainly to the US. According to World

Energy Council data, Gabon's oil production has decreased since its peak of 370,000bpd in 1997, and has averaged around 14,000bpd over the last 10 years. Tullow Oil remains a major player in Gabon, but has reduced activity across its portfolio of more than 20 non-operated onshore and offshore fields.

DRC's oil and gas discoveries in major lakes in the eastern part of the country give it the largest crude oil reserves in Central and Southern Africa after Angola. In terms of offshore activities, Perenco is conducting oil extraction off the coast of Muanda. The company, the country's sole oil producer, uses well workovers, ESPs and enhanced water injection facilities to help mitigate production decline.

In Congo-Brazzaville, SOCO International has started drilling its Baobab Marine-1 wildcat well in the Lower Congo offshore basin. This well is targeting early Miocene channel complexes based on seismic data. Meanwhile, earlier this year, Total SA commended production at Moho Nord field, located 75km offshore. The field was developed through 34 wells tied back to a tension-leg platform and to Likouf, a floating production unit. Once processed on Likouf, oil is then transported by pipeline to the Djeno onshore terminal. ♦

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PUBLIC AND PRIVATE SECTOR COOPERATION VITAL FOR UGANDA

Cooperation between government agencies and private companies, as well as working closely with its neighbours, are essential for the Ugandan oil and gas industry to prosper. *Oil Review Africa* editor, Georgia Lewis, looks at developments since the last quarter of 2016.

INFRASTRUCTURE IS AN essential part of Uganda's oil and gas industry development, and significant progress has been made in this regard, particularly since September 2016.

The latest developments involve the cooperation of stakeholders in the public and private sectors, as well as working closely with other countries in Africa.

In Uganda, the oilfields are owned by Total, CNOOC and Tullow Oil. According to government estimates, Uganda has 6.5bn barrels of crude oil reserves, and between 1.4bn and 1.7bn barrels of recoverable reserves.

Plans for an industrial park

In September 2016, SMEC, an engineering and development consultancy, was engaged by Uganda's Ministry of Energy and Mineral Development to develop a master plan for an oil and gas industrial park in Kabale, in the country's west.

The government has allocated 3,000 ha of land for the project. It is slated to form part of a new industrial city, including an oil and gas refinery, energy and petrochemical facilities, and international airport.

During construction, the refinery will create approximately 5,000 jobs, and approximately 650 jobs during operation.



The town of Kabale is set to benefit from the development of an industrial park with oil and gas facilities.

Pipeline progress

In May this year, Uganda and Tanzania signed a framework agreement on the proposed US\$3.55bn crude oil export pipeline. If the project is completed on schedule, it is

expected to start transporting Ugandan oil to international markets in three years.

According to Reuters, this agreement covers tax incentives, timelines for implementation, local content requirements and

the size of the pipeline. It will be 1,445km long and 24 inches in diameter, and it will be heated to keep the viscous crude oil flowing. It will start in landlocked western Uganda and terminate at the Tanzanian Indian Ocean port of Tanga.

Total has said it is willing to fund pipeline's construction but has not disclosed its stake in the project. Gulf State Engineering, based in Houston, has been awarded the front-end engineering design contract.

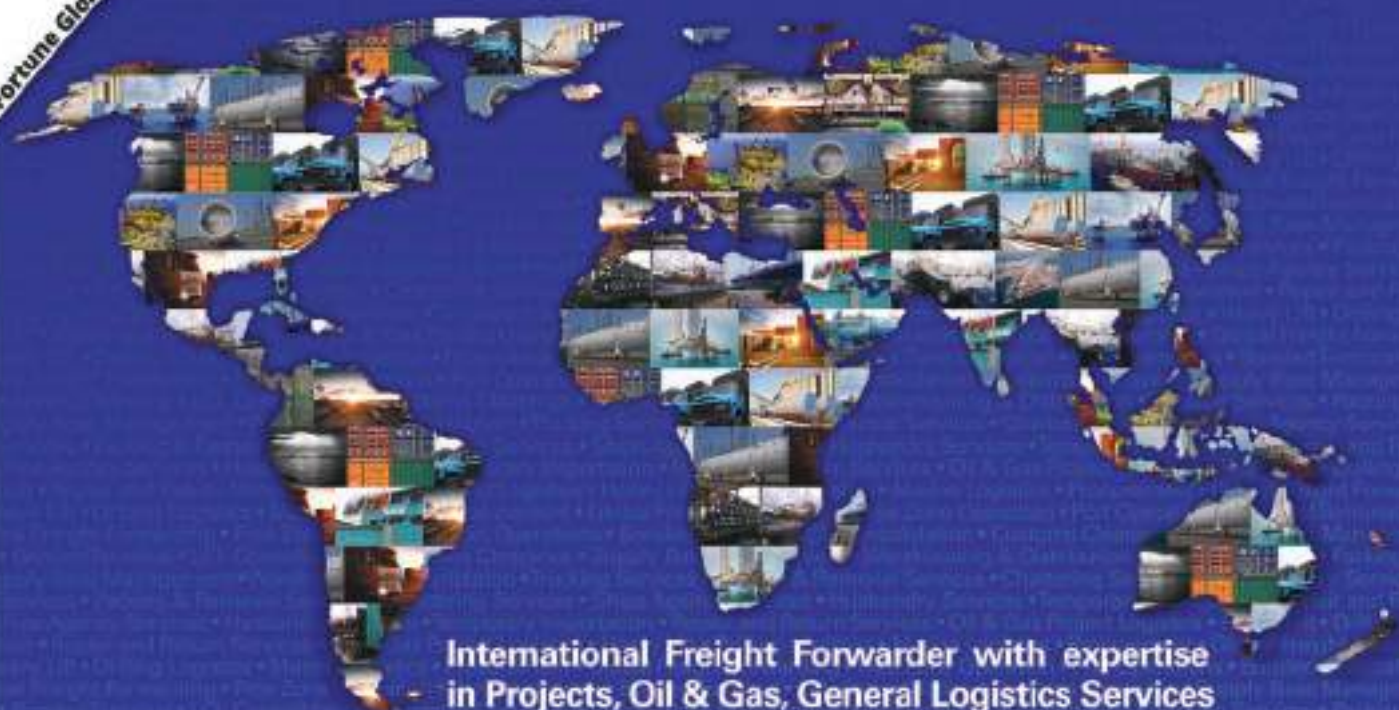
PSA with Oranto Petroleum

In June this year, Uganda signed two oil production sharing agreements with Nigeria's Oranto Petroleum.

The Ministry of Energy and Mineral Development confirmed that the deal with Oranto covers the Ngassa Shallow Play and Ngassa Deep Play exploration blocks, near the southern part of Lake Albert. Oil was first discovered in the Albertine rift basin, near the border with the Democratic Republic of Congo in 2006. This represents an important change in the way the Ugandan government issues licenses. It was originally done on a first-come, first-served basis but once the commercial potential was realised, new laws were passed to better manage the sector. Exploration licenses are now granted on a competitive basis. ♦

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GROWING THE BUSINESS IN CHALLENGING TIMES

Omotade Abimbola, Managing Director of Technixs, talks to *Oil Review Africa* about the most promising markets in Africa, adding value for clients and emerging stronger despite the low oil price environment.



Offshore operations are important to Technixs. A new offshore operation fleet is part of the company's future plans.

Image Credit: Technixs

How has Technixs coped in the low oil price environment?

The low oil price has shrunk the market considerably almost in every department of the industry. Our projects are both green-field and brown-field based. Greenfield type projects are worst hit by this condition. At Technixs, we have concentrated on brownfield activities and provided value-added services.

What regions of Africa offer the greatest opportunity for your business at the moment?

Nigeria is still the region with the greatest opportunity in Africa, despite the agitations in the Niger Delta area. Angola is the next after Nigeria.

How important is meeting local content requirements when working in Africa?

The local content initiative is a necessity for

growth locally. The initiative is beginning to take root, and the effects will be remarkable in a few years.

What new innovations have helped the business to grow during these challenging times?

Growth at this time has been minimal. We have generally revisited brownfield type situations and improved our value-added services.

“Nigeria is still the region with the greatest opportunity in Africa, despite the agitations in the Niger Delta area”

Do you have any corporate social responsibility (CSR) initiatives you'd like to share with *Oil Review Africa* readers?

CSR initiatives are not hard to find in Africa. In fact, there seems to be a need for CSR programmes in every square inch. At Technixs, we believe education is critical to development. We have, therefore, invested in providing scholarship for some indigenous individuals where we work.

What exciting plans for the future does the company have in its African markets?

We are on the verge of upgrading our IT systems – this includes new software for our operation, and critical real-time monitoring devices. We are also adding new equipment across the entire scope of our operations. These include smaller additions, such as hand-held, state-of-the-art devices through to a completely new offshore operation fleet. ♦

COMPRESSORS: DRIVING AFRICAN PRODUCTION

The use of compressors for multiple applications, such as maintaining or increasing gas flow into a pipeline system, is commonplace throughout Africa, and an integral part of the production process. Martin Clark reviews the latest advances in compressor technology.

THERE ARE MANY applications for compressors across industries ranging from petrochemicals and industrial gases, through to refineries, gas transport and storage. And the technology behind these technical workhorses varies greatly.

Reciprocating compressors may be used in small and medium-size fields, while centrifugal compressors may be deployed on larger fields.

Likewise, the industry supports many other solutions to meet the myriad requirements and challenges posed by complex reservoir structures and other industrial environments.

Major players include the GE Oil & Gas which is supplying its electric motor driven centrifugal compressors in support of Ghana's emerging offshore industry. Four compressors have been installed on the Offshore Cape Three Points (OCTP) project for Italian energy major, Eni, which delivered first oil production this May.

The machinery will help support up to 85,000 barrels per day (bpd) of production from the integrated development, made up of the Sankofa Main, Sankofa East and Gye-Nyame fields, some 60 km off the Ghanaian coast.

Ghana has been a hive of activity for compressor suppliers lately as its energy sector has expanded. Dresser-Rand, a part



The Offshore Cape Three Points project has compressors from GE Oil & Gas,

Image Credit: Eni/Flickr

of the Siemens empire, is to install two of its compressor trains to an onshore receiving facility in western Ghana, again on behalf of Eni.

The company's DATUM compressor units will be driven by a Siemens gas turbine and installed near the village of Sanzule. The onshore site, to be operational by February 2018, will eventually receive non-associated gas from offshore for further compression and injection into the national gas pipeline network.

The compressors are scheduled for delivery in September and October this year.

Downstream, Germany-based MAN Diesel & Turbo signed an

order earlier this year to supply two large compressor trains to Dangote Oil Refining Company which is building Nigeria's largest refinery. The giant trains consist of an axial compressor driven by a steam turbine with about 30 megawatts (MW) power, delivered with a comprehensive auxiliary package, to support the production of fuel.

The US\$12bn refinery is to be built in the Lekki Free Trade Zone of Lagos State, and is intended to ease Nigeria's chronic fuel shortages, despite the country long being Africa's biggest crude oil producer.

Other major players serving this market, which continues to

evolve with the expansion of Africa's energy sector, include the likes of Atlas Copco, which similarly maintains a strong regional footprint.

Likewise, Burckhardt Compression's South Africa base serves energy markets across the continent, from Angola and Nigeria, through to emerging territories like Mozambique and Tanzania. Despite other challenges facing operators, including a lowly oil price putting pressure on economics, compressors form an integral part of Africa's energy supply chain, keeping the production flowing and output steady, whatever the prevailing industry conditions. ♦

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PORT HARCOURT REFINING COMPANY OBTAINS ISO 9001:2008 CERTIFICATION

When the Port Harcourt Refining Company sought ISO 9001:2008 certification, Bureau Veritas was chosen as the partner for the project, after a long history of working together.

PORT HARCOURT REFINING COMPANY (PHRC), a subsidiary of the NNPC group, was in search of an internationally renowned certification body with a proven track record to certify its quality management system.

They needed to ensure conformity and that their Quality Management System (QMS) met the requirements of the ISO 9001:2008 Standard. The relationship between Bureau Veritas and the NNPC group began in 2000 with the ISO 9001:2000 certification for NETCO (another subsidiary of NNPC). NETCO went on to integrate the ISO 14001:2004 Environmental Management System standard to form an Integrated Management System, also certified by Bureau Veritas.

The challenge

PHRC needed to establish and implement an effective QMS in line with the ISO 9001 standard. This was essential for securing a competitive edge and increasing market share by addressing issues relating to customer satisfaction, process performance and compliance.

The solution

Bureau Veritas Nigeria Limited was appointed to carry out the certification audit. The first stage of the audit involved a documentation review. This was to assess conformity to the standard requirements and validate the scope of the certification.

During this audit, the audit team conducted a process-based audit focusing on the process interaction, documentation and work practices of PHRC.

Bureau Veritas assessed the level of implementation of the quality management system requirements, following which PHRC was recommended for certification subject to the closure of the non-conformities raised during the audit.

Positive outcomes

After the certification was complete, the client reported significant, measureable improvement. For example, PHRC experience a 20 per cent increase in the returns on shareholders' investments; 98 per cent rating in customer satisfaction surveys; and a 20 per cent reduction in

“The client reported significant improvement, including a 50 per cent increase in both efficiency and profits”

importation of finished products due to PHRC's increased productivity. Additionally, efficiency and profits both improved by 50 per cent.

Testimonial

“Bureau Veritas is a stickler for integrity. Rest assured [that] if they dare to append their logo on your company, productivity must increase by [a] ripple effect, market share, sales and profit against all odds,” said the former deputy manager, TQM PHRC.

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OFFSHORE PRODUCERS ON A TECHNOLOGY LEARNING CURVE

The hunger for new technology for offshore construction in Africa – and the challenges in funding these large-scale projects – is immense and it has placed everyone involved on a steep learning curve. Martin Clark reports on how the countries are stepping up to the plate.

WEST AFRICA'S OFFSHORE sector has long claimed many world firsts, as technology has continually pushed the boundaries in terms of water depths and extraction techniques. Though the industry is now maturing, the pace of development and innovation continues much as before.

Offshore and onshore, that includes the rapid advance of digital technology, across upstream and downstream.

Drilling data is streamed in real-time from the drill string and surface equipment throughout the drilling of a well; workers meanwhile are data-enabled, allowing them to read information in an instant to make informed decisions. It is a fast evolving technological environment, all located just off the west African shoreline.

Now, though, offshore development is moving beyond traditional markets, such as Nigeria and Angola, and into newer territories like Ghana. And there are other aspiring offshore producers, from Liberia and Senegal in the west, to Tanzania and Mozambique in the east.

It means the era of big oil – and big data – is bringing great challenges to all involved.

While these new countries may lack many of the skills and infrastructure that is now taken for granted in Angola and



Image Credit: Dan Shean/Flickr

Ghana's Sankofa project will help bring electricity to the towns and cities of the west African country.

Nigeria, these new local players are learning fast.

Ghana's first deepwater oil development, Jubilee, is now seven years old, after first production started in 2010.

Next year, the flagship Sankofa project is due to launch, unlocking vast offshore gas deposits to feed hungry power stations onshore. Officials hope the US\$7.7bn project will put an end to Ghana's perennial energy shortages.

But the growth of this industry – including the sheer

scale of a project this size, and the complexity of financing it – has been a steep learning curve for all involved. The pace of activity demands specialists to make sure things are done right.

Industry classification group Lloyd's Register recently teamed up with local firm GOSCO to provide well project management, well engineering and associated site survey, geotechnical and rig inspection services to offshore Ghana.

The joint venture, Lloyd's Register Wells Ghana Limited,

aims to make available world-class engineering and operations, risk management and performance solutions in support of all upstream operators. The firm "will provide the very latest know-how and application of technology for well operations" as well as safety, says Lloyds Register's Matt Rothnie.

As the industry matures in Ghana – and as it expands into other frontier markets across both western and eastern Africa – such initiatives are surely a sign of things to come. ♦

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PROCESS AUTOMATION CHANGE DRIVEN BY TECHNOLOGY

Oil and gas companies like everything to run smoothly, but in such a complex and hazardous environment, that's quite a task. Martin Clark reports on how technology is improving process automation for the industry.

EVERY PLATFORM, RIG or downstream site knits together a complex web of technology, systems and processes, all typically drawn from different suppliers and contractors.

Process automation is, therefore, a critical part of making things flow, using state-of-the-art technology to ensure everything is running correctly, and triggering warnings when threats emerge. It is a trusted part of the production process, and the endless quest for maximum return and efficiency

on assets and resources.

And Africa's energy sector relies on it as much as any other region. Swiss automation experts Endress + Hauser said that the Africa region experienced "solid growth" during 2016 when announcing its full-year results.

But this already complex set of processes looks set to become more sophisticated with the increasing convergence of new digital technologies in the market and ever larger amounts of data produced from upstream fields and installations.

A report by Frost & Sullivan

says the convergence of algorithms, cloud, data, devices and networks will "drive a creative destruction and expansion of traditional business models", ultimately creating new, more efficient solutions for the sector. Another trend, it notes, is the industry preference towards "solution integration", to offer a broader insight into the whole enterprise.

This will drive further collaboration between information technology and operational technology, which flattens the traditional layered

hierarchical architectures present in process industries.

Expect traditional automation companies to re-position and re-brand to better serve customers. This has already led to the emergence of several digital industrial platform offerings such as Ability from ABB, PlantWeb Digital Ecosystem from Emerson, Predix from GE Digital, Lumada from Hitachi and Watson from IBM.

Another is Mindsphere from Siemens, an open, cloud-based system that lets operators connect their physical infrastructure to the digital world. The technology lets users harness big data from countless intelligent devices for insights across the whole business.

"Digital industrial platforms will emerge as the cornerstone to unlock value and generate alternative revenue monetisation streams from existing products and solutions across the automation solutions market," says Ticaram Ramakrishnan, a Frost & Sullivan analyst.

Of course, there are other considerations for African operators. More efficient tech solutions may improve operations and, profits, but could undermine job prospects for locals. At a time when Nigeria and others are committed to boosting employment, it may not be a win-win situation. ♦



Image Credit: Miradest/Wikimedia Commons

Internet connectivity is now an important and unavoidable part of modern oil and gas operations.

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SATELLITE MAPPING FOR UPSTREAM: THE VIEW FROM ABOVE

Satellite imaging is being used by operators to reduce the time, risk and cost of upstream projects through their whole lifecycle. Documenting difficult terrain, such as the Sahara, is improved enormously with this technology. Martin Clark reports.

SATELLITE MAPPING HAS become an increasingly important part of the oil and gas toolkit, offering support to operators and drillers in their quest to better understand reservoir structures, geography and geology.

Specialist data providers such as Satellite Imaging Corporation (SIC) assist in the provision of vital imagery during the whole upstream cycle, from exploration and development through to actual production.

It says acquiring and processing images on areas of interest will lower exploration risk and decrease the overall cost of any project. And on any multi-billion-dollar venture that can equate to a lot of money.

With strong satellite coverage worldwide, images can be retrieved even from the most difficult-to-photograph areas of the world, and no matter how remote. That includes heavily forested areas and sparse deserts.

SIC has helped oil and gas companies get a better glimpse of areas deep in the Sahara desert, for projects in southern Tunisia and in Algeria.

The list of applications is extensive, with images potentially used to detect or confirm seismic lines and help to plot well locations. The imagery can also be used to document persistent oil seepage offshore and even



Image Credit: Stuart Rankin/Florb

reduce the time needed to plan and build additional infrastructure, such as access roads to connect remote sites.

That, of course, includes aiding the planning of pipelines too, an area where satellite imagery comes into its own especially in working through difficult or challenging environments, such as dense rainforest areas or swampland, both commonplace in Africa.

Imagery used for oil and gas applications typically ranges from around half a metre resolution for detailed studies to 15 metres resolution for more regional applications.

Another major international company engaged in this niche is aircraft giant, Airbus. Michael Hall, senior geologist, Airbus

Defence and Space, says gathering satellite derived Earth Observation (EO) data offers focused geospatial intelligence to support the whole project lifecycle, as they progress from exploration, through to development, production, and ultimately right down to the decommissioning stage.

“Utilising EO data for supporting exploration activities has increased in recent years in parallel with the technological progression in satellite sensor technology,” he says, “coupled with the use of satellite constellations where two or more satellites with similar capabilities are operated together.”

This is echoed in a white paper, *Profits Under Pressure*, delivered by DigitalGlobe, which

highlights the rise in importance of satellite technology for the energy industry.

Its Spatial on Demand service is a geospatial solution created specifically for oil and gas.

“Up-to-date, high-resolution imagery is necessary for assessing areas of interest as they appear today,” it states in the paper. “Data from last year won’t help you if natural or man-made changes have occurred in the meantime.”

It also says that imagery over time must form a part of the data package too, when piecing together upstream projects.

“Temporal completeness – imagery over time – is essential for avoiding gaps in your operating picture. Missing data can mean unexpected surprises.” ♦

DON'T GET LEFT BEHIND - IOT FOR OIL AND GAS

A whitepaper by Bsquare outlines hybrid Internet of Things (IoT) architecture to address the unique challenges faced by upstream oil and gas operators, delivering vital business benefits.

THE DIGITALISATION OF oil and gas production involves an extraordinarily large volume of data that can potentially be generated at upstream production sites and network transport costs are high. These challenges can be addressed by relying on edge analytics shaped by broader cloud-based analytics covering massive data sets.

Traditional approaches sacrifice different pools of data to keep costs down, at the expense of accuracy. But with hybrid IoT architecture, edge and cloud processing optimise cost and accuracy. This delivers near-zero unplanned production downtime; lower costs; and improved efficiency.

The figure shows a hybrid IoT architecture – data generated by onboard sensors is processed by a “collect” function. In addition to filtering and normalisation, the collect function determines if data should be processed locally or forwarded to the cloud. Normally, data can be handled locally by on-board data analytics, rule processing and automation.

In a typical deployment, initial data sets are forwarded to cloud databases. This allows machine learning software working with extremely large data sets to develop accurate device models (“digital twins”) that include status information and behavioural characteristics. Using digital twins, rules can be generated that embody business logic. Rules are complex “if-this-then-that” statements that detect certain conditions and orchestrate required actions. These rules can be generated automatically by the IoT system or they can be authored manually by subject matter experts.

Once digital twins and rule are generated, rules can be pushed down to individual sites for local processing, without sacrificing accuracy. Then, substantially all processing is performed locally. Cloud-based analytics functions periodically sample results to detect when accuracy declines and make corrections.



IoT uses for upstream

Predictive failure — Many oil and gas operators employ “run-to-fail” strategies with production equipment. Historically, the cost of periodically testing and maintaining equipment at widely distributed sites exceeded the cost of replacement. But with IoT, the ability to automatically predict equipment failure with advance warning for smooth remediation without entailing unplanned downtime changes that cost equation. Run-to-fail resulted in unplanned downtime. With IoT, the cost of monitoring and predicting equipment failure is reduced, and unplanned downtime can be eliminated.

Adaptive diagnostics – IoT gives the ability to aid the diagnostic process and bring equipment back online more quickly, reducing downtime. In a typical adaptive diagnostics scenario, remediation steps are predetermined before repair technicians are dispatched. Predetermined diagnostics are based on real-time and historical operating information and can pinpoint repair steps with greater accuracy than traditional troubleshooting. Technicians can be outfitted with the right replacements, avoiding multiple site visits.

Condition-based maintenance – In almost all circumstances where maintenance schedules are followed, they are based on elapsed time or hours of operation, not equipment condition or other factors. This leads to under- or over-servicing, adversely impacting equipment performance and longevity. With condition-based maintenance, equipment is only serviced when conditions warrant. This is determined with real-time and historical data from entire populations of similar devices and contextual data, extending equipment life and reducing service expenses.

Asset optimisation – Using data gathered from dispersed production sites, IoT machine learning and data analytics create models for equipment. These models can be compared to identify equipment that is performing more poorly than like equipment at other sites. Robust digital models can determine which equipment is underperforming and provide insight into why. With a better understanding of underperformance, remediation can be automatically generated to improve site yield. ♦

This is an edited version of a whitepaper: 'IoT in Oil & Gas: Don't Get Left Behind'. www.bsquare.com.

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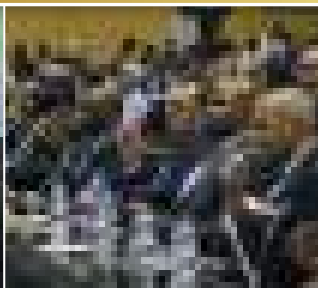

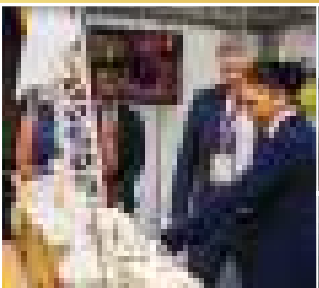



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SAFETY CLOTHING: THE LAST LINE OF DEFENCE

Frontline professionals in the oil and gas industry face many life-threatening hazards on a daily basis, from fire and explosions through to exposure to toxic chemicals. Safety clothing plays a vital role in protecting workers. Martin Clark reports.

IN CHALLENGING ENVIRONMENTS, whether that's remote offshore oil rigs or petrochemicals sites, it's essential that workers are kitted out with the right gear. International players such as Du Pont, 3M and Lakeland specialise in providing protective clothing and equipment for energy sector employees, from safety goggles and respiratory protection through to fireproof suits. Other major players in the personal protective equipment (PPE) market include Uvex, Honeywell, MSA Safety, Lindstrom, Kappler and Bergeron.

The largest markets are South Africa, with its vast downstream infrastructure that includes pioneering gas and coal liquids installations, to Nigeria and its mighty upstream industry.

In these and other important markets, from Angola to Algeria, energy rules often dictate the use of specific safety clothing and appliances for employees.

Many of the occupational health and safety issues are the same across these territories: workers may be exposed to a multitude of dangers, from exposure to raw materials and sludge, or naturally occurring radioactive materials, through to contact with substances such as asbestos, hydrochloric acids or formaldehydes.

One African success story is Charnaud, which started out as a



A smoke hood could save a worker's life in the event of a fire.

Image Credit: MSA Europe

South African business but now has a UK office with European Union (EU) distribution, and is selling its safety clothing across five continents.

In Africa, it distributes into nearly all of the continent's major oil and gas producing states, out

of its Ladysmith headquarters. Another is Sturrock and Robson Africa which likewise offers its expertise for participants in the petrochemical industry.

The most obvious risk, of course, anywhere there is oil and gas, is the outbreak of fire or

even the triggering of an explosion through vapours, which calls for the strictest adherence to safety protocols.

Above and beyond this, workers depend on state-of-the-art fire safety wear, which has evolved massively with new materials and innovations.

Other technical gear for hearing protection, welding helmets, heavy duty hand gloves and specialist coveralls with chemical protectives has similarly advanced to offer better protection for workers as well as improved performance.

And this evolution continues, as the influx of younger workers into the industry creates opportunities for the introduction of more stylish, intuitive and technologically advanced PPE, says one Frost & Sullivan research analyst.

Sanjana Prabhakar says that the segments that will experience the fastest growth are respiratory protection and head and face protection, while awareness of the danger of inhaling fumes and gases will stoke demand for welding respirators.

"Growth in the head-and-face protection segment will be driven by higher demand for helmets with advanced technology. For example, helmets that come equipped with higher lens clarity and touchscreen technology will find enthusiastic acceptance in the market." ♦

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PUBLIC AND PRIVATE SECTOR COOPERATION AT PRACTICAL NIGERIAN CONTENT

The importance of commitment by the public and private sectors in boosting local content, as well as cooperation, will be high on the agenda at this year's Practical Nigerian Content Forum, to be held in Uyo, Akwa Ibom State, in November.

REPRESENTATIVES FROM GOVERNMENT and business are among the confirmed speakers for Practical Nigerian Content.

Udom Emmanuel, governor of Akwa Ibom State, will be one of the leading government figures on hand to share his perspectives. Uyo, the capital of Akwa Ibom State, is the location of this year's event.

The Nigerian Content Development and Monitoring Board (NCDMB) will have two representatives this year – Engineer Simbi Kesiye Wabote, executive secretary for NCDMB, and Patrick Obah, the board's director of planning, research and statistics.

To this end, NCDMB has signed a memorandum of understanding (MOU) with event organisers, CWC.

Under the terms of the MoU, the NCDMB & CWC alongside Nigerian partner, Levmore Services will collaborate to deliver greater value through PNC. This will be achieved by further engaging with the relevant Government Parastatals and private sector players. Ensuring the pertinent issues surrounding Nigerian Content regulation and implementation discussed at the conference unlocks opportunities, and drives progress in the Nigerian oil and gas industry.

From the private sector, Taofiq Adegbite, chief executive



The Practical Nigerian Content Forum will focus on opportunities for indigenous workers across the industry.

Image Credit: Wikimedia Commons/United States Navy

officer of Marine Platforms, and Chike Onyejekwe, group managing director for exploration and production for Aiteo Eastern Exploration and Production Company, will be speaking.

The main topics for the conference will be adopting Nigerian content policy across various industries, opportunities for implementing Nigerian content, R&D development, improving industry processes, promoting capacity development, and outlining plans to increase access to the Nigerian Content Development Fund.

Following the enactment of the Nigerian Oil & Gas Industry

Content Development Act (NOGICDA) the CWC Group launched the PNC Conference in 2011. Through their partnership and consultation with the NCDMB, from 2013, CWC were required to increase domestic capacity through partnerships with local companies, training of indigenous personnel and increasing the number of local suppliers patronised.

"Over the past five years, we have made some real strides in developing capacity within the events space for the oil and gas industry in Nigeria, thanks to the support of the NCDMB," said Wemimo Oyelana, vice president, production, for CWC.

"There is still work to be done and CWC remain committed to creating platforms for senior decision makers to devise strategies that will steer Nigeria's energy industry towards sustainable growth."

The CWC Group's activities in Nigeria also strive to support development across the country. The company is a supporter and active member of the Nigerian Business Coalition against Aids (NiBUCAA) and the Sickle Cell Aid Foundation. CWC regularly provides support through funding, donations and marketing campaigns. ♦

For more information, log onto www.cwcpnc.com



7TH PRACTICAL NIGERIAN CONTENT

6-9 November 2017

Le Méridien Ibom Hotel & Golf Resort,
Uyo, Akwa Ibom, Nigeria

I look forward to welcoming oil and gas industry players to what promises to be a useful and impactful gathering. Now in its' 7th year, the Practical Nigerian Content Forum, organised in partnership with the CWC Group, remains the annual industry gathering on Nigerian Content implementation.

Engr Simbi Wabote

Executive Secretary

Nigerian Content Development & Monitoring Board

Distinguished Speakers Include:



Hon. Udom Emmanuel
Governor
Akwa Ibom



Engr Simbi Kesiye Wabote
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OFFSHORE CONFERENCE TO FOCUS ON CYBER THREATS TO OIL AND GAS

Technology has transformed the oil and gas industry in so many ways, especially in regard to big data and operational efficiency. But with these advances come security risks. SPE Offshore Europe will focus on how to manage these risks at this year's conference.

THE SCALE AND severity of attacks on industrial cyber systems is growing and has the potential to put oil and gas infrastructure, critical processes and workers' lives in danger. SPE Offshore Europe 2017 will host a keynote panel session on cyber and physical attacks on the industry to help delegates understand the risks, manage detection of threats and defend against malicious actions.

BBC security correspondent, journalist and author, Frank Gardner OBE, who survived being shot six times by Al-Qaeda terrorists in a Riyadh suburb in Saudi Arabia, will be part of the expert panel.

The session will be chaired by Deirdre Michie, chief executive of Oil & Gas UK, and will involve Professor David Stupples, Director of Electronic Warfare Systems Research, University of London, who will reveal research into the cyber threat specific to the oil and gas industry. In particular, he will talk about cyber attacks on SCADA – supervisory control and data acquisition. Other keynote speakers include Dominic Armstrong, president of Herminius, a risk management and intelligence consultancy.

"The cyber threat is no longer an 'emerging' risk but one that is forcibly having a severe and hazardous impact on day-to-day



Image Credit: SPE Offshore Europe

Technology will once again be a strong feature at the SPE Offshore Europe event in Aberdeen, Scotland.

operations," said Sue Frye, director of Europe, Caspian, & Sub-Saharan Africa Events for the Society of Petroleum Engineers.

“ Understanding and managing the risks is the responsibility of everyone, from rig workers to investors”

"Understanding and managing the risks is the responsibility of everyone in the sector, from rig workers to investors. Delegates will leave with a better understanding of the shifts in global strategic risks to oil and gas operations and the 'new realities,' threats and vulnerabilities that companies are facing."

Under the theme Embracing New Realities: Reinventing our Industry, SPE Offshore Europe 2017 will offer more than 65 free-to-attend technical presentations and 11 keynote panel sessions combined with

business breakfasts and topical lunches. A "new for 2017" Decommissioning Zone will feature a themed exhibition and conference space showcasing decommissioning technology and service providers and a conference programme organised in association with Decom North Sea, IMechE, ITF and SUT.

SPE Offshore Europe has been held biennially in Aberdeen since 1973. It is the largest E&P conference and exhibition outside North America. ♦

www.offshore-europe.co.uk

AFRICAN RIG COUNT

COUNTRY	May 2016	June 2016	May 2017	June 2017
ALGERIA	53	53	53	57
ANGOLA	9	9	3	2
CAMEROON	1	0	1	2
CONGO (BRAZZAVILLE)	1	2	3	2
CONGO (DRC)	1	1	0	0
CÔTE D'IVOIRE	2	2	1	1
EGYPT	28	26	23	27
GABON	1	1	1	1
GHANA	1	1	1	1
KENYA	11	11	9	8
MAURITANIA	11	11	11	11
MOZAMBIQUE	0	0	0	0
NIGERIA	6	5	8	8
SENEGAL	1	1	2	2
SOUTH AFRICA	1	1	0	0



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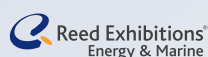


"SPE Offshore Europe is an important event to be at and see the latest technology and thinking in our industry."

CHIEF OPERATING OFFICER,
XCITE ENERGY RESOURCES



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FOR 2017**



Nampak Glass creates new opportunities for gas operations

NAMPAK GLASS HAS commissioned a 1km high-pressure underground pipeline, which feeds from the existing Sasol Gas Ltd's transmission network and ties into the newly constructed Nampak Pressure Reduction Station (PRS) in Germiston in South Africa.

The high-pressure underground pipeline construction includes a pressure reducing and metering station with two parallel lines, one in service and the other on standby. The lines boasts a filter separator to clean the gas, an electric heater to heat the gas prior to the Joule Thompson effect, when the pressure is reduced and a flow meter to

measure gas flow. In addition, each line also has a regulator and slam-shut valves for pressure reduction and control and to protect the downstream equipment.

South Africa's Energas Technologies supplied the electric heaters, filter separators, flow meters, insulation joints, isolation valves, control and slam-shut valves as well as relief valves, said the company.

Started in April 2016, the construction of the high pressure underground pipeline project was overseen by Saiyl and completed within deadline and budget in May 2017.

Biral installs VPF-730 Present weather sensor at offshore wind turbine substation

THE GLOBAL METEOROLOGICAL instrument manufacturer Biral has installed its VPF-730 Visibility and Present weather sensor at the Borkum Riffgrund 2 windfarm substation in the German North Sea.



Image Credit: Observator Group

Biral's VPF-730 sensor was supplied through the Observator Group from the Netherlands, which installed a helideck monitoring system onto the substation for windfarm Borkum Riffgrund 2 in the German North Sea.

Supplied by the Observator Group from the Netherlands, the sensor installed a helideck monitoring system at the substation, which measures all weather conditions during helicopter landing and take-off operations to ensure flight and passenger safety.

The VPF-730 weather sensor aims to provide accurate visibility and present weather measurements in a rugged package, ideally suited to marine offshore installations. It focuses on ensuring safety, reliability and long-life in national weather service networks and remote monitoring stations.



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VisualSoft system to be installed onboard the cable-laying vessel, NKT Victoria

FORUM ENERGY TECHNOLOGIES has announced a new contract that will see its pipeline and cable survey software, VisualSoft, installed on the cable laying support vessel, the NKT Victoria.

The company announced that two VisualSoft Four Channel High Definition Digital Video Systems (VisualDVR MCHD) will be supplied to the iSURVEY Group, a provider of survey and positioning services to the global oil and gas and telecommunications sectors. The NKT Victoria which operates in the Moray Firth, UK, will be the first vessel installation for the newest system in the VisualSoft range.

The NKT Victoria (DNV-GL Class) is a 140m x 30m DP3 top-of-the-range diesel electric vessel with 1600m² of deck space and two large offshore cranes. The high capacity cable lay system features a battery energy storage system to assist the cable loading in the event of failure of the shore power used during loading.

The Caithness Moray High Voltage Direct Current (HVDC) project in Northern Scotland is the largest investment in the region's electricity network since the hydro development era of the 1950s. It will see the electricity grid on either side of the Moray Firth connected via a new submarine cable capable of carrying up to 1,200MW of electricity.

Andy McAra, product director at VisualSoft said, "We are very excited



Image Credit: VisualSoft

The VisualSoft suite is a modular range of software applications designed specifically for use during subsea structure and pipeline inspections.

to release our new multi-channel high definition video solution to the market and it is great to be supplying the first of these systems to iSURVEY who we have had the pleasure of working closely with for many years."

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Sand control technology for boosting water injector wells

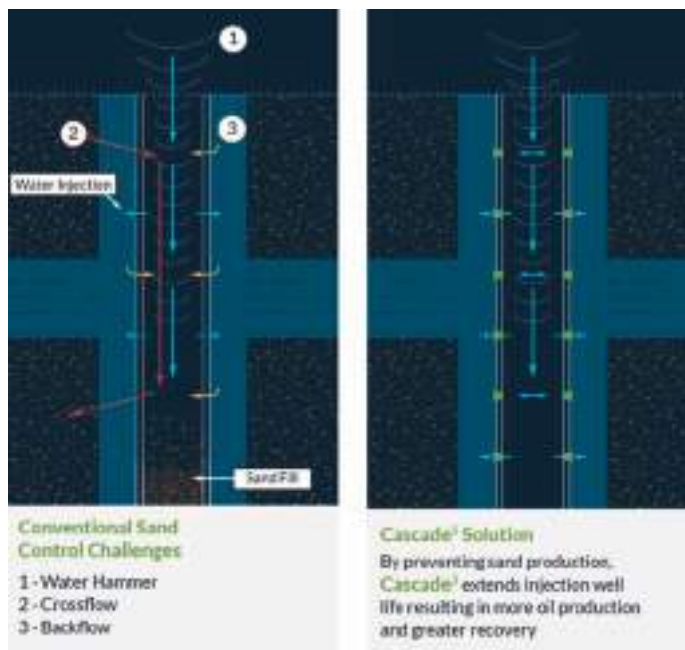
A NEW SAND control technology has been introduced to the market by Tendeka. Cascade³ is a valve-and-screen solution.

High density of flow control valves are mounted within conventional sand screens to allow high water injection rates while increasing sand control reliability and maintaining injectivity over time.

According to Tendeka, the product eliminates the failure mechanisms associated with water injection wells, providing operators with improved injectivity, recovery, and well life.

While water injection programmes can optimise oil recovery by 20 per cent, crossflow, backflow and water hammer can lead to fines building up inside the sand screen completion and impaired injectivity.

Cascade³ is compatible with gravel packs and stand-alone screens, and prevents backflow while allowing unrestricted injection. In addition to boosting production, Cascade³ reduces the need for interventions and re-drills, lowering long-term operational costs.



A diagram of how Cascade³ technology works.

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PROUDLY NIGERIAN IN A COMPETITIVE MARKET

Baywood Continental Limited has been a strong player in the Nigerian oil industry for 28 years. The company's founder and CEO, Emperor Chris Baywood Ibe, talks to Bola Olowo about successes and future plans in the big Nigerian market.

Tell us about Baywoods experience with the Nigerian local content policy.

Without local content, Baywood would not have been able to execute its landmark project – Even Nigeria as a whole would not have been able to showcase its talents in the oil and gas industry. Although Baywood was doing well before the local content, its introduction had opened more opportunities, so the local content policy is playing very well for us. However, the Nigerian government needs to look at the issue of the lowest bidder, as the policy is preventing the growth of the local companies as the return on investment is so low, or nonexistent, that most local companies find it difficult to grow capacity. Besides we are seeing lots of mediocrity because of the lowering of the entry barrier. The local content needs operators who are driven by passion, companies are not growing capacities, cost of borrowing is high, there is lack of international muscle, and so lots of local content companies are finding it increasingly difficult to stay afloat. So there is need for government to review the local content policy. Baywood has been in the industry for over 28 years, the government should help companies like us to grow.

Baywood has spent more than \$70mn in vital sectors of its operations over the years. Is this because of a strong belief in the Nigerian economy?

Yes, we are a very well-equipped company. Baywood had to map out some strategic investments in equipment, technology and our people to enable us to position ourselves for the opportunities that abound in the Nigerian oil and gas industry.

Can you tell us about the onshore pipeline which Baywood designed,



Emperor Chris Baywood Ibe

engineered and constructed for Total Exploration and Production?

The OML 58 OUR gas pipeline, which we successfully completed and handed over to Total, is a flagship project for Baywood. The pipeline is the largest onshore pipeline in West Africa, extending for 46km in the Niger Delta area of Nigeria. Baywood carried out the detailed engineering, procurement and construction of the pipeline. Several challenges were encountered during the course of the execution of the project but our dynamic risk assessments throughout the project duration made for a successful completion with an enviable zero fatality rate.

Tell us about the challenges of doing business in Nigeria.

The challenges are tasking, but Nigeria is a big market, so no matter the challenges, it is the place to be. We are in other parts of Africa, but this is where the opportunities are because of the size, the population. Yes, we provide our utilities, such as power, but doing business in Nigeria is still rewarding.

How does Baywood give back to the society through corporate social responsibility?

Baywood has a good community relationship – we have never been shut down, or driven out of any community because we support the local community, we supply amenities. We train, we look at their basic needs, we look at those who are ready to work, we offer jobs, and we make sure there is a formal agreement in whatever we do.

How is Baywood planning to work in marginal and matured fields in Nigeria?

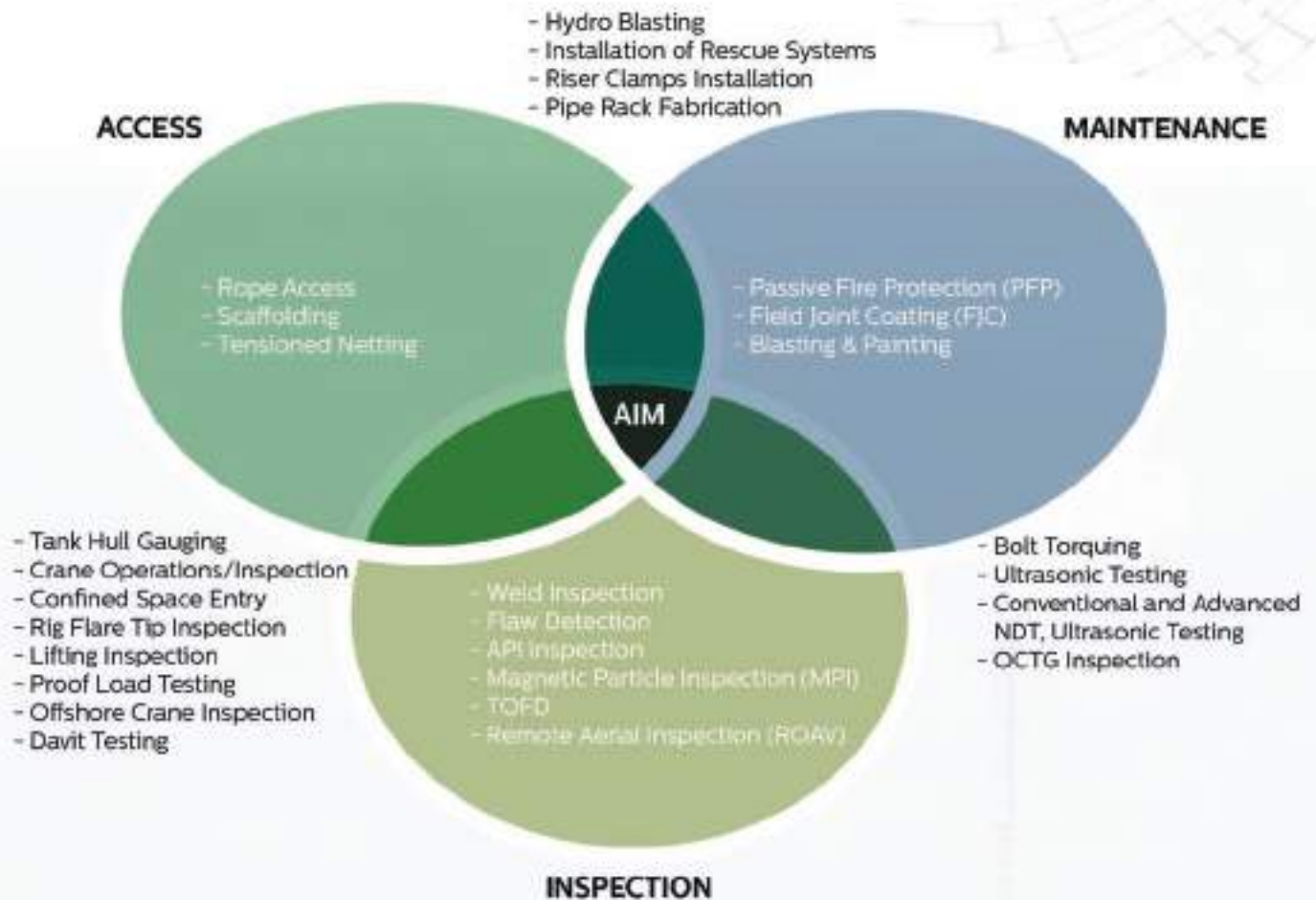
Baywood intends to go to the marginal fields acquisition – we are looking at matured fields, we are interested in gas, as we believe that gas is the future. We believe that once the government gets its gas policy right, gas will become the next frontier. But Nigeria needs to develop the gas infrastructure, and generate gas for the huge domestic market.

What are Baywood's future plans?

The company is doing well, it has weathered the storm, we have seen all situations have been in business for over 28 years, the company is adaptable to changes. Our expansion policy is to go in tandem with government policies. We will be very interested to be a key player in the Gas Masterplan for the Nigerian government. Baywood is also eager to go into other profitable sectors, such as construction. ♦

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