

# Oil Review

Oil · Gas · Petrochemicals

## Africa

VOLUME 11 | ISSUE 5 2016

## African oil and gas: What is on the horizon?

Industry updates from Côte d'Ivoire, Madagascar,  
Mauritania and Senegal

Fire safety and risk management

Quality of life for offshore employees



Preye Berezi of PFL Engineering talks  
about safety and local content (p30)

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On page 15, there is a broad analysis of the future of the continent's oil and gas industry.

## EDITOR'S NOTE

The future of the African oil and gas industry is open to speculation, not least because the continent itself is not homogenous. Rather, it is an exciting and dynamic continent made up of diverse countries and economies at different stages of development. On page 15, analyst Moin Siddiqi gives his comprehensive overview of what might lie ahead for Africa.

We pay special attention to the markets of Senegal (page 22), Mauritania (page 22), Côte d'Ivoire (page 26) and Madagascar (page 28). All four countries share great ambitions for their hydrocarbons sectors but it is still uncertain as to how many will become the new major players.

Elsewhere in this issue, we talk to Sodexo about the importance of quality of life for staff who work offshore (page 34), industry experts discuss the latest advances in fire safety (page 36), new pipeline guidelines are outlined (page 42), and there is an overview of EOR and data analytics presentations from a Society of Petroleum Engineers conference (page 38).

**Georgia Lewis**  
Managing Editor

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# Executives Calendar 2016

## OCTOBER

### 17-19 The 8th Saudi Arabian Oil & Gas Exhibition

Dammam  
www.saoge.org

### 18-19 The 37th Oil & Money Conference

London  
www.oilandmoney.com

### 23-26 OTL Africa Downstream

Lagos  
www.otlafrica.com

### 26-27 Bottom of the Barrel Technology Conference

Manama  
www.bbtc-mena.biz

### 31- 1 Nov 23rd Africa Oil Week

Cape Town  
www.africa-oilweek.com

## NOVEMBER

### 6-9 SABIC Technical Conference-12

Jubail  
www.sabic.com

### 7-10 Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC)

Abu Dhabi  
www.adipec.com

### 8-10 Deepwater Operations

Galveston, Texas  
www.deepwateroperations.com

### 15-17 East Africa Oil & Gas Summit & Exhibition

Nairobi  
www.eaogs.com. www.deepwateroperations.com

### 15-17 1st Africa Oil & Gas Local Content Conference & Exhibition

Luanda  
www.ametrade.org/alc/

### 22-24 The 6th Practical Nigerian Content Forum

Abuja  
www.cwcpnc.com

### 23-24 MSGBC Basin Summit & Exhibition

Dakar  
www.msgbc.theenergyexchange.co.uk

### 30-2 Dec Mozambique Gas Summit & Exhibition

Maputo  
www.mozambique-gas-summit.com

## DECEMBER

### 5-7 Africa Energy and Technology Conference

Nairobi  
www.spe.org/events

### 5-7 OpEX MENA 2016 - Operational Excellence in Oil, Gas & Petrochemicals

Abu Dhabi  
www.europetro.com

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

## Leading players and Congo update at 2016 Africa Oil Week

THE 2016 AFRICA Oil Week conference, to be held in Cape Town from 31 October to 4 November, will include 130 speakers and more than 1,000 senior delegates from Africa, its governments and leading companies from the continent and the rest of the world.

Following formal ratification of the new Petroleum Code by Parliament, HE Jean-Marc Thystere Tchicaya, Ministre des Hydrocarbures de la République

du Congo, will provide details on the Petroleum Code together with an update of the 2016 License Round.



*Cape Town will be the picturesque location for Africa Oil Week.*

There will be leading speakers on oil, gas LNG and upstream and more than 100 exhibitors, showcasing new technologies.

Additional events include a local content forum, the Africa Independents Forum, the Africa Exploration Zone, a young professionals meeting, a Law of the Sea workshop, a Global Women Petroleum and Energy Club luncheon, and the "Big Five" board awards. The event has been running since 1994 and has a strong reputation for offering excellent opportunities.

[www.Africa-OilWeek.com](http://www.Africa-OilWeek.com)



"L-R: David Doig (OPITO Group Chief Executive), Emmanuel Onyekwena (MD, Tolmann) & Graham Gall (OPITO MD); during OPITO Engagement and share workshop with relevant stakeholders in Lagos recently".

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## PwC Oil and Gas Review urges change for Africa during volatile times

CONSULTANCY FIRM PWC has released its *Africa Oil & Gas Review 2016*. Despite the downturn, a lack of confidence in investing and the volatility in foreign currencies, the review reports on opportunities in the hydrocarbons sector. It analysed activity in African oil and gas markets over the last year and urged reform of regulatory, fiscal and licensing systems, according to Chris Bredenhann, PwC oil and gas advisory leader.

He says that with the focus on cost-cutting, there will be an increased demand for innovative technology. He added that investing in training will improve skills and standards and give local players a chance to enter the sector. Uncertain regulatory frameworks, corruption, poor infrastructure, meeting taxation



Image Credit: Emerson

*New technology, such as Emerson's multiphase flow meter, needs to be embraced.*

requirements, and a lack of skills will need to be addressed, according to the report. Additionally, difficulty in obtaining government sanction for new projects holds back the industry in many African countries.

Bredenhann said it is essential for operators to respond quickly

to the digital revolution and technological breakthroughs, adopting transformative trends such as the internet of things, building alliances, simplification, standardisation, solution-based buying and knowledge transfer from IOCs to oilfield services companies.

## US and Angola discuss petroleum and power cooperation in Washington DC

A DELEGATION FROM Angola met with the US Department of State's Energy Resource Bureau in August for a discussion which focused on petroleum and power sectors. Angola was represented by the minister of petroleum,

Jose Maria Botelho de Vasconcelos, and the minister of energy and water, Joao Baptista Borges. The meeting was co-hosted by the US Department of State's special envoy and coordinator for international

energy affairs, Amos J Hochstein, and the US Department of Energy's assistant secretary for fossil energy, Christopher Smith.

The US and Angolan delegations reviewed progress made in the bilateral relationship in the energy sector since the last dialogue in August 2011. The need for regulatory change in the energy sector and the need to create a favourable business climate to attract more private investment to Angola were discussed in detail.

Other topics discussed included operational security and the environmental impact of oil and gas operations. The dialogue concluded with US and Angolan representatives reaffirming their joint commitment to cooperating in relation to energy.



Image Credit: APR Energy

*Operators perform maintenance at the APR Energy plant in Rocha Pinto, Angola.*

## Tullow Oil goes into production in Kenya

TULLOW OIL HAS confirmed that it will start commercial oil production in Kenya from March 2017 and first exports are slated to commence from June 2017. This was announced in late August at a meeting at State House between President Uhuru Kenyatta and Tullow founder and CEO Aidan Heavey.

This follows on from a special cabinet meeting, chaired by President Kenyatta, in which he approved the plan for development, commercialisation and early production of Kenyan oil. Tullow has already experienced success in Kenya with significant deposits found in 2012 in Turkana County.

"The country is now getting ready to full commercial exploitation," said a statement from State House. "In this regard, the country is in the process of establishing an enabling commercial and infrastructure arrangement that will facilitate the creation of an international market for Kenya's crude oil."

Under the arrangements, production will commence at a rate of 2,000-4,000 bpd. These will be transported to Mombasa for export and the Eldoret-Lokichar Road is being upgraded to facilitate this plan. The Kainuk Bridge is also being replaced so it is strong enough to carry heavy oil transportation vehicles.

The Kenyan cabinet approved the development of the Lokichar to Lamu oil pipeline. In the first half of 2016, Tullow reported an after-tax profit of US\$30 mn. The revenues were lower on the previous year as a result of lower commodity prices and reduced Jubilee production, which is the subject of an insurance claim.

## Practical Nigerian Content conference raises big issues

FOR THE PRACTICAL Nigerian Content conference, to be held in Abuja from 22-24 November, the organisers have announced the major issues that will be addressed by the event's top level speakers.

The National Petroleum Investment Management Services (NAPIMS), the Nigerian Content Development Management Board (NCDMB), and IOCs will discuss ways that operators can reduce long contracting cycles. Additionally, the NCDMB will be asked about revising the Nigerian Content Development Fund to serve the financing requirements of local operators and service companies. The government

speakers will address strengthening links between the oil and gas industry and critical infrastructure development.

Government representatives will also be on hand to discuss the state's plans to identify and eliminate oversubscription of bids and tenders by non-qualifying companies.

State and company representatives will address upholding stringent Nigerian local content requirements.

Indigenous producers at the conference will explore their role in growing reserves and increasing production.

[www.cwcpnc.com](http://www.cwcpnc.com)

## UK government supports Mozambique investment

TO ATTRACT INVESTORS to Mozambique's emerging oil and gas sector, the UK Prosperity Fund is backing a four-month programme run by Adam Smith International. The programme started in September with a training course for 40 delegates from Pemba Municipality, the government of the Cabo Delgado Province and surrounding districts.

The programme will support the development of a strategy to support investment in the Pemba region and provide recommendations on the creation of an oil and gas promotion unit to encourage further investment. The British



Image Credit: Raul Sauer/Flickr

*There is a new dawn for Mozambique's oil and gas industry.*

High Commissioner to Mozambique, Joanna Kuenssberg said the UK government will "continue providing support in sectors where we can reduce poverty and our companies have significant global expertise."



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## Border stake could affect Kenya oil reserves

THE SOMALI MARITIME territorial dispute could mean Kenya has to forfeit three oil blocks. Kenya is fighting to hold on to a potentially lucrative Indian Ocean oil and gas reserves as a maritime border dispute with Somalia goes before the United Nations top court in The Hague in September.

The dispute came from 2014 when Somalia claimed that the sea border needed to be redrawn. This would mean that of Kenya's 20 offshore oil blocks, three would now belong to Somalia.

Kenya is a relative oil newcomer, and is opening itself up as becoming a future major oil producer. Italy's EniSpa were awarded three of the oil blocks by the Kenyan government.

Somali President Hassan Sheikh Mohamud said on state radio in Mogadishu: "I am confident that we will win that case." However, attorney-general

Image Credit: Paula French/Shutterstock



*A Masai on the beach overlooking the disputed territory in Kenya.*

Githu Muigai, who is leading Kenya's delegations to the international Court of Justice has "contested the jurisdiction of the ICJ [International Court of Justice] to hear the matter."

The essence of the dispute is how the two countries should

draw the line of the sea boundary separating the two countries. This disputed triangle of water is around 100,000km<sup>2</sup> in area, and as of a few years ago, was discovered to have the potential to have valuable deposits of natural gas and oil.

## High impact drilling to commence in Côte d'Ivoire in 2017 for African Petroleum

AT A PRESENTATION given by African Petroleum at the Pareto Securities – Oil & Offshore Conference, held in Oslo, the news was bright for the future of hydrocarbons development in Côte d'Ivoire. In conjunction

with Ophir Energy, which holds a 45 per cent stake, African Petroleum will start high impact drilling in the CI-513 block in the second half of 2017.

A new PSC has been negotiated for this licence with

good fiscal terms, lower holding costs and an extension to work commitments. African Petroleum is also the 90 per cent stakeholder and main operator of Côte d'Ivoire's CI-509 block.

Cairn Energy and Total have also made material hydrocarbon discoveries in adjacent acreage.

As well as the positive news to come from the company's interests in Côte d'Ivoire, the presentation also shared promising news from other interests in the continent, including a 90 per cent interest in a block in Senegal, widely tipped to be the next location for a hydrocarbons boom in West Africa, high impact drilling slated to start in the third quarter of 2017 in Gambia and promising prospects in Liberia.



Image Credit: Clara Sanchez/Flickr

*African Petroleum is flying the flag for Ivorian hydrocarbon development.*

## Update on FPSO Kwame Nkrumah damage

THE FPSO KWAME Nkrumah, a Jubilee Field FPSO which suffered a damaged turret bearing earlier this year, has had its hull and machinery insurance cover confirmed.

The Ghanaian FPSO is operated by Tullow Oil and its joint venture partners and the insurance policy covers relevant operating and capital costs associated with the current operating procedures at the FPSO, as well as the long-term solution to ensure it becomes fully operational again.

Tullow is now working closely with the loss adjusters and reinsurers to establish an efficient payments schedule while remedial work continues on the damaged turret bearing. Additionally, Tullow is also working with business interruption reinsurers on confirming cover for loss of production and revenue caused by the turret bearing failure.

The FPSO Kwame Nkrumah has been placed on heading control through the use of tugs, which reduce vessel movement around the bearing.

Tullow announced in April 2016 that a technical investigation had taken place on the turret bearing and it found that it was damaged and could no longer rotate as originally designed. Oil and gas export was able to continue, albeit under revised operating and take-off procedures. As well as the tugs, new procedures include the use of a dynamically positioned shuttle tanker, with a capacity of 250,000 barrels of oil, and a storage tanker with a capacity of 1 million barrels of oil, for safe production and take-off operations.



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## Local content and future strategies on the agenda at the Mozambique Gas Summit

WITH MOZAMBIQUE'S REPUTATION as a leader in East African gas development steadily growing, the forthcoming Mozambique Gas Summit is a timely event.

The National Content Day will be a much-anticipated part of the event with updates from government and international players on the new legislation that aims to build capacity, enhance the role of SMEs and ensure the country's gas development offers benefits to a large number of people along the entire value chain, and in industries that grow as a result of a burgeoning gas industry.

On National Content Day, representatives from the government will outline the state's vision for a successful implementation of national



Image Credit: Rosina/Flickr

*Local content laws aim to improve opportunities for Mozambican workers.*

content policies. There will also be speakers and discussion on strategies for successful collaboration, the role of SMEs, and how local companies can partner up with international players and qualify for participation in gas and LNG projects. Developing best

practices and bridging the skills gaps to ensure capacity building will also be on the agenda on the National Content Day.

*The Mozambique Gas Summit will be held at the Joaquim Chissano International Centre, Maputo, from 30 November to 2 December.*

## Nigeria attempts to offset impact of oil price slump with large-scale tax crackdown

WITH LOW OIL prices pushing the Nigerian economy into its first recession in more than 20 years, the country's government is embarking on a large-scale tax crackdown, seeking out 700,000 firms which have never paid tax.

The OPEC member slipped into recession during the second quarter of 2016 amid militant attacks on oil facilities in the Niger Delta region (see news story, right). These attacks have led to crude oil production,

which provides 70 per cent of government revenues, to be cut by around a third.

Reuters reported that planned loan deals with foreign lenders have not materialised, and this has left the government struggling to fund a record 6.06 trillion naira 2016 budget, which was created with the aim of stimulating growth by tripling capital expenditure.

"We collected a little over 2.3 trillion, so far, from January to 32 August," said Tunde Fowler, chairman of Nigeria's Federal Inland Revenue Service, of the tax crackdown, which targets individuals as well as companies. "It is almost at par with last year but take into consideration the economy is going through a little slowdown."



Image Credit: Cristiano Zingale (Kouam)/Flickr

*The Nigerian oil slowdown has seriously impacted the country's economy.*

## Niger Delta Avengers claim pipeline attack

ATTEMPTS TO RESTORE order to Nigeria and fully recommence oil production suffered a setback when the Nigerian militant group, the Niger Delta Avengers, claimed responsibility for a pipeline attack on 23 September.

According to Reuters, it was the first pipeline attack since a break in hostilities was declared in August so talks with the government could be pursued.

The Niger Delta Avengers posted a statement on their website which said it has "brought down oil production activities at the Bonny 48 inches crude export line". In an emailed statement, a spokesman for the group said the attack took place in the sea near Bonny Island in Rivers State, where a number of oil facilities are located.

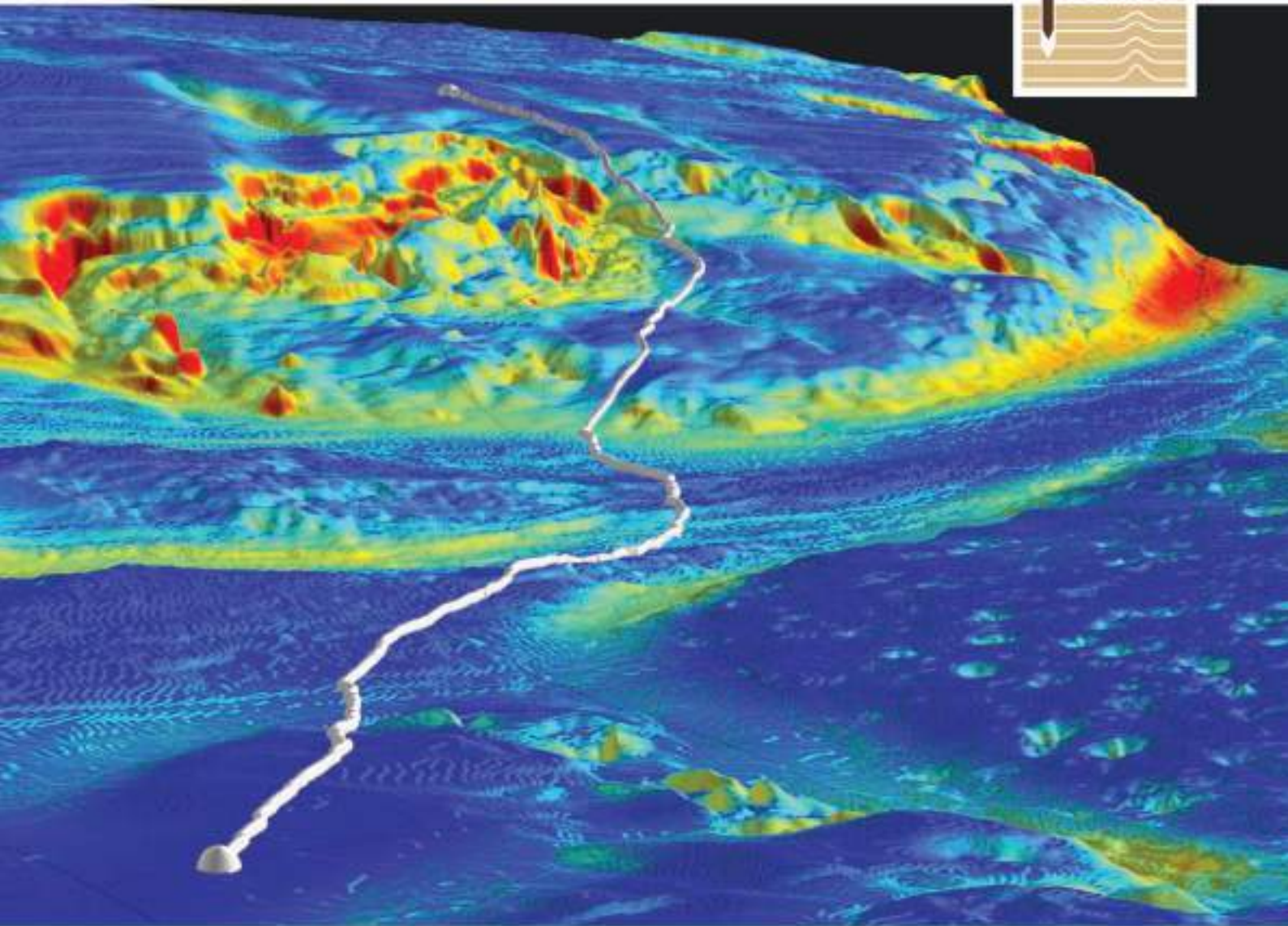
The group is demanding a greater share of Nigeria's oil wealth to go to the Niger Delta, where most of the country's crude oil is produced.

Describing the latest attack as a "wake-up call" for the Nigerian government, the Niger Delta Avengers spokesman claimed the group is still in favour of dialogue and negotiations.

The attack was condemned by the Pan-Niger Delta Coastal States Stakeholders' Consultative Forum, which represents the elders of the communities living in the Niger Delta.

Chief Edwin Clark, the forum's leader issued a statement following the attack, saying that the Niger Delta Avengers had violated the 60-day ceasefire and that there was no justification for the attack. He called on the militants to lay down their arms and stay calm and peaceful.





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## Turbulent times for Sonangol after multiple projects are suspended and block stake sale is terminated

SONANGOL, ANGOLA'S STATE oil company has continued its turbulent year with the suspension of refining and terminal projects, a stake sale terminated in August, and a delayed takeover of drill ships.

In August, Sonangol announced the suspension of construction at the Lobito refinery and ocean terminal of Barra do Dande. In a statement, the company said work was suspended to reassess the projects' "strategic vision". The Lobito refinery was slated for completion in 2011, but it has been delayed for high costs and financing problems.

Reuters reported in August that Cobalt Energy terminated the proposed US\$1.75bn sale of a 40 per cent stake in two offshore oil blocks to Sonangol because it did not receive the necessary approvals from the Angolan government within a one-year timeframe. Then, in September, fears grew for the

*The Sonangol headquarters in Luanda, Angola.*



Image Credit: ChimpanzaPez/Flickr

liquidity of Korean-based Daewoo Shipbuilding and Marine Engineering (DSME) when it became apparent that Sonangol would delay its planned takeover of

two drill ships. Daewoo had planned to deliver the two ships to Sonangol in mid-2016 but this was postponed until September.

DSME was expecting to receive the remaining contract fee of US\$1bn. However, the latest takeover of the drill ships has been delayed for a second time by Sonangol with the company citing financial difficulties.

At the time of going to press, DSME was seeking 80 per cent of the US\$1bn in cash and the rest in stocks. Sonangol has established a special purpose vehicle to manage the drill ships. DSME has said it will take the shares of this new company.

If the takeover does not take place until 2017, this will increase the financial burden for DSME. In June 2016, Angola's president, Jose Eduardo dos Santos appointed his daughter Isabel dos Santos as head of Sonangol after sacking the entire board in April.

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# AFRICA'S FAST-EVOLVING ENERGY LANDSCAPE

*The East African Rift Valley has been a location of serious hydrocarbon exploration since 2006.*

Image Credit: Justin Raycraft/Flickr

Moin Siddiqi analyses the impressive hydrocarbon discoveries across Africa and the prospects for developing these discoveries with a view to creating jobs, overcoming poverty and contributing positively to growth across multiple countries.

**P**OST-2010 WORLD-CLASS natural gas finds off the East Africa coast, deep and ultra-deepwater oil discoveries off the Gulf of Guinea to the west, and promising geology along the East African Rift, make the African continent one of the last frontiers for energy development in the world. New energy producers, led by Mozambique, Tanzania, Ghana and Uganda, are expected to contribute to increased production in the decades ahead.

Given the sheer volume of Africa's proven reserves and high probability of future discoveries, foreign energy and energy service companies stand to gain from new E&P activities on the continent, which will help to offset natural declines in more mature hydrocarbons provinces. According to US Geological Survey, sub-Saharan Africa (SSA) is estimated to contain about 20

and 17 per cent, respectively, of the world's undiscovered but technically recoverable conventional oil and natural gas resources. Hence, the continent is well endowed to meeting future global energy demand needs.

The US Energy Information Administration (EIA) projects world crude oil consumption at 120.9mn bpd by 2040, an increase of 27.8mn bpd from

**“ Given the sheer volume of African reserves, foreign energy and energy service companies stand to gain from new E&P activities”**

2015's consumption levels of 93mn bpd (OPEC figures). Thus new supply should exceed 28mn bpd just to offset production declines in mature fields, mostly in non-OPEC regions. Meanwhile, global spare production capacity remains low (below 2mn bpd) and with 2-3mn bpd of current output vulnerable to geopolitical risks, diversity of future supply is pivotal to oil price stability.

Global natural gas demand and seaborne LNG trade are projected to reach over 4 tcm and 450 bcm, respectively, by 2020 and 2019, based on the International Energy Agency (IEA) figures. China, India and other emerging countries will largely drive the demand surge as they diversify away from coal-fired power stations.

Promising discoveries have opened Africa up to a new wave of exploration. It has induced oil

majors and small- and mid-size Western independents to play important role at a time when access to global reserves is on the decline or restricted, notably in the Middle East and former Soviet Union. NOCs are acquiring greater ownership, leaving IOCs in search of prospective frontier acreage like SSA, which boasts a significant resource base for reserve replacement.

In the wake of the 2007 Jubilee Field discovery, offshore Ghana by Kosmos Energy, with recoverable reserves of 2bn barrels, IOCs began focusing on West Africa waters off Liberia and Sierra Leone and more recently off Senegal's coast. The Liberian Basin consists of 30 concessionary blocks, 17 of which are from the continental shelf to depths of between 2,500 to 4,000 metres. Exploration interest is also reported across

the Sahel, from Taoudenni Basin (Mali) and Niger to Sudan and South Sudan. But ongoing insecurity in the region and unfavourable fiscal regimes make future E&P uncertain.

## “Mozambique and Tanzania remain the priority of foreign majors when it comes to natural gas, with colossal finds off the coasts of both countries”

New discoveries elsewhere in the Gulf of Guinea and advanced seismic technologies continue to boost reserve estimates of declining producers, notably Cameroon, Gabon and Congo-Brazzaville. Potentials exist in Cameroon's under-explored East and West Bakassi, Manyu and Kombe-NSEPE Basins. Successful exploration in Brazil's sub-salt acreage has encouraged IOCs to focus on Angola, Gabon and Namibia. These countries share geological structures similar to Brazil, where 10 to 20bn barrels of ultimate recoverable oil were found in 2006/07 off the Brazilian coast in pre-salt formations.

Sizeable oil finds by Heritage Oil and Tullow Oil during 2006-7 in Uganda's Lake Albert Basin led to renewed exploration along the East African Rift Valley, which extends from Ethiopia and Somalia in the north and southward into Lake Malawi and central Mozambique. There is also oil in the Congo (DRC), on the other side of Lake Albert. Tullow in late 2012 discovered heavy crude at Kenya's Lokichar Basin, with recoverable reserves estimated at 1bn barrels.

Ethiopia's Ogaden Basin holds potential, while oil

discovery in two of Somalia's semi-autonomous states of Puntland and Somaliland are geologically promising. However, both lack thus far proper legal and regulatory frameworks to develop new discoveries. The United Nations warns, “Oil search in northern Somalia risks stoking tension”.

In natural gas, Mozambique and Tanzania remain the priority of foreign majors. Colossal gas finds off the coasts of both countries since 2010 represented one of the most exciting upstream exploration success of recent years. With subsequent discoveries, the two countries' combined estimated recoverable resources in the prolific Rovuma Basin are reckoned to exceed 200 tcf above total reserves of Venezuela (198.4 Tcf). Moreover, East Africa's new deepwater gas

resources are relatively easy to access – less than 60 miles from shore – compared to ongoing E&P projects up to 200 miles offshore in Australia.

Investing in deep and ultra-deep waters remains a risk, but the potential for lucrative earnings in under-explored areas of Africa is undeniable. According to Standard Bank, capex in SSA's upstream hydrocarbons sector could total US\$1.5 trillion by 2030, provided fiscal regimes are internationally competitive and host countries are politically stable, offering secure resource ownership rights. Such capex will range beyond just exploration and extraction, and should create demand for oilfield services, such as subsea equipment and installation, procurement, construction, installation and operational and

professional services, including project finance.

These investment flows could prove transformative for countries and the wider region in terms of new infrastructures and technology transfers. For example, the Lamu Port Southern Sudan-Ethiopia Transport Corridor (LAPSSSET), mega-project aims to link member-countries to a deep-water Kenyan port in Manda Bay, with a rail line, road networks, oil pipelines to South Sudan, Uganda and Ethiopia, as well as airports and an oil refinery.

Energy resources offer scope for local benefit and economic diversification. The average per capita power consumption in SSA (outside South Africa) is reportedly 180 kilowatts per hour (compared to a global average of 313). With rapid urbanisation and economic growth in future years, ample natural gas reserves could meet the continent's power needs more efficiently and environmentally sustainably than coal-fired power plants using heavy imported oil.

Mozambique's hydrocarbon law, passed in August 2014, requires future gas projects to channel a quarter of all energy produced for the local market. Tanzania's natural gas policy also favours reserving a large quantity of gas for domestic consumption. Presently, the Songas Ubungo power plant (fed by Songo Songo gasfield) provides about one-third of Tanzania's electricity.

Finally, energy resources can help integrate more labour-intensive sectors with the hydrocarbons industry, thereby reducing reliance on a single primary commodity. Nigeria in recent years has developed several gas-to-industry projects, mostly in petrochemical and fertiliser business. The Indorama Eleme plant is poised to become SSA's biggest petrochemical producer, using natural gas to produce feedstock for plastics for export and secondary industries

### Sub-Saharan Africa: Oil and Natural Gas Reserves, 2015

COUNTRY	Crude Oil	Natural Gas (Trillion cubic feet)
ANGOLA	12,700	10.9
CAMEROON	400-1,000	4.8-6.0
CHAD	1,500	0
CONGO	1,600	3.2
COTE D'IVOIRE	0	1.0
EQUATORIAL GUINEA	1,100	1.3
GHANA	2,000	1.5
GABON	2,000	0
KENYA	600-1,000	0
MOZAMBIQUE	0	125-155.0 (est.)
NAMIBIA	0	2.2
NIGERIA	37,200	187.0
RWANDA	0	2.0
TANZANIA	0	57
SOUTH AFRICA	15	390.0
SOUTH SUDAN	3,500	0
SUDAN	1,500	0
UGANDA	2,500	0.5

Source: BP, EIA, Oil & Gas Journal, and official estimates.

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within Nigeria. Africa's largest oil refinery is being build by the Dangote Group.

Nigeria is among the very few GTL producers besides Qatar and Malaysia. Its US\$10bn EGTL facility at Escravos (online mid-2014), operated by Chevron,

**“ Africa’s frontier areas have made major IOCs highly selective in allocating their capital and final investment decisions are subject to delays”**

converts 325mn cubic feet/day of natgas into 33,200 bpd of liquids, principally synthetic diesel for cars and trucks.

The plant's long-term capacity, using the Fischer-Tropsch process and Chevron's ISOCRACKING technology, could be expanded to 120,000 bpd according to sponsors.

In sum, Africa's frontier areas offer unparalleled opportunity in deepwater exploration and production, which requires huge capex to bring new discoveries to market – prerequisite for meeting robust energy demand over the medium to long-term.

Faltering oil prices have made major IOCs highly selective in allocating their capital, thus final investment decisions on new African-focused projects are subject to delays – contingent on



Lake Malawi is considered a potential oil bonanza for the eastern country.

Image Credit: Matthew and Heather/Flickr

the duration of the low oil price cycle. Assuming oil prices and regular investment flows normalise over the next year, Africa's untapped oil and gas

resources can help facilitate broader industrial investment beyond the energy sector, creating new jobs and combating poverty in multiple countries. ♦

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# EAST AFRICA LEVERAGES OIL AND GAS FOR ACCESS TO ENERGY

Alleviating energy poverty is set to be a driving factor in moving East African hydrocarbon development forward, particularly in Kenya and Mozambique. Uganda, meanwhile, makes progress with pipelines. *Oil Review Africa* editor, Georgia Lewis reports.

**A**CCORDING TO EY'S 2016 Africa Attractiveness Programme: Staying the Course, East Africa is closing Africa's FDI gap. Despite the collapse of commodity prices and some currencies in 2015, East Africa recorded its highest share of FDI across Africa, 26.3 per cent of total projects.

As well as investment in Kenyan solar energy, Power Africa, a US government foreign aid programme, will invest in a gas-to-power project. The US Trade and Development Agency and Zarara Oil & Gas funded a US\$996,600 grant to assess the technical, economic and environmental aspects of the proposed Lamu gas-to-power project on Pate Island, adding 50-200 MW of electricity generation capacity.

While Mozambique is regarded as the next big prospect for East African hydrocarbons, Kenya may join the drive towards oil and gas-driven prosperity, as exploration continues apace. Tullow, Maersk and Africa Oil plan to recommence drilling in the South Lokichar oil basin by the end of 2016.

In March, Gigawatt Mozambique announced a US\$220mn investment into Mozambique's energy sector, with stakeholders such as the World Bank and Standard Bank. The investment aims to leverage Mozambican gas and it is hoped



Kenya's Pate Island could be the site of one of the most important East African gas-to-power developments in the coming years.

that neighbouring countries will benefit too.

South Africa's Sasol is upbeat about prospects in Mozambique, despite the country missing a loan repayment in May. Sasol released a statement to say the issue would not affect its US\$1.4 bn gas project. It owns 70 per cent of the project, the Mozambican government holds a

25 per cent stake via national company CMH and the International Finance Corporation owns five per cent. The project lies about 600km north of Maputo and the first of 12 planned wells were drilled in May 2016. Production is expected by mid-2019. Access to energy is an aim of the project with the first phase including an

oil, LPG and gas project adjacent to the Pande and Temane fields.

Uganda is also set to become another major hydrocarbons player. In April 2016, the Ugandan and Kenyan governments agreed to develop separate oil export pipelines and Tullow is working with Total. CNOOC and the Ugandan government to develop resources via a Uganda-Tanzania pipeline.

In August 2016, progress was made when the Ugandan government approved the field development plans and issues petroleum licences. A refinery is part of the Tullow-Total-CNOOC partnership. ♦

**“ While Mozambique is regarded as a big prospect for hydrocarbons, Kenya may join the drive to oil and gas-driven prosperity ”**



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# REACHING OUT ACROSS BORDERS

Mauritania and Senegal are taking steps to work together to unlock the potential of large gas discoveries on the maritime border between both nations. Thomas Golembeski, vice president of corporate communications at Kosmos Energy discusses the oil company's gas project on the maritime border in an exclusive interview with *Oil Review Africa*.

**I**N THE BACKDROP of the fall in oil prices, even as many oil and gas companies are cutting back on exploration spending, exploration activity in the West African countries of Senegal and Mauritania has attracted global attention.

It was in 2012 that US based oil company, Kosmos Energy, acquired three blocks offshore Mauritania. Early 2D and 3D seismic studies conducted by the company revealed a very large geological gas fairway that began in Mauritania and stretched across the maritime boundary into Senegal. Kosmos began its exploration shortly afterward and since April 2015, the company has drilled five consecutive wells in the region with a 100 per cent success rate: Tortue-1, Marsouin-1, Guembeul-1, Ahmeyim-2 and Teranga-1.

**“ Both governments are ‘highly motivated’ to see this project come to completion and have expressed willingness to work together to develop the resource.**

*The gas discovery on the maritime border between the two nations could hold up to 50 tcf of resource potential.*



Image Credit: Kosmos Energy

The company's exploration activities revealed a prolific inboard gas fairway that extends roughly 80 km north of the maritime boundary between Senegal and Mauritania and 80 km south of the maritime boundary, stretching from the Marsouin-1 well in Mauritania through the Greater Tortue area on the maritime boundary to the Teranga-1 well in Senegal. According to the company, it has discovered a gross Pmean resource of approximately 25 tcf and estimates the fairway may hold more than 50 tcf of resource potential. The discovery at the Guembeul-1 well has been described as one of the most significant finds for the

West African gas industry in several years.

“Tortue-1 found the gas, Guembeul-1 confirmed that the gas was on both side of the maritime boundary and Ahmein-2 confirmed that there was sufficient gas resource to underpin an LNG gas development project,” said Thomas Golembeski, vice president of corporate communications at Kosmos Energy describing the exploration journey.

### Sharing the resource

While this gas discovery holds great potential for the economies of both nations, as the hydrocarbon resource is split

almost exactly in half by Mauritania's border with Senegal, the question of resource sharing looms large. To gain benefit from the resource, both governments will have to work closely together and co-operate over the costs and results of the development, as well as over security, social and environmental issues.

According to Golembeski, both governments are ‘highly motivated’ to see this project come to completion and have expressed willingness to work together to develop the resource.

“Both Mauritania and Senegal recognize the many benefits the Ahmeyim/Guembeul gas project and the large gas discoveries offshore will bring to both

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countries over the long term. President Aziz (Mauritania) and President Sall (Senegal) fully support the project and have made public statements about their desire to see it move quickly and their willingness to cooperate to make it happen,” Golembeski noted.

Senegal’s energy minister Thierno Alassane Sall told state television this year after the find, “This is the best news possible for our country.” He added that it would allow Senegal “to be self-sufficient in energy and also export gas to the rest of the world”.

### The working group

To facilitate co-operation between the two nations and to take the project forward, a working group has been formed with the representatives of the national oil companies, representatives of the ministries and Kosmos. The working group has been meeting regularly since November 2015 and have already agreed upon on the development concept and the location for the offshore floating LNG infrastructure, which is on the maritime border between the two countries, about eight kilometres from the coast to house processing facilities and gas production from the field.

The working group has agreed upon a small-scale phased approach for the development of the resource that, according to them, represents the fastest and most competitive way for the two countries to begin initial LNG exports and deliver early gas to the domestic markets. The current development concept – which is still being refined – aims to produce approximately 8 tcf of gas over 30 years. According to Golembeski, this small-scale, phased approach is better than alternatives as a larger scale project would add 5-10 years to first gas production and marketing a large volume of LNG, such as 10 metric tonnes

per annum or more, would delay the development as well as delivery of gas to domestic markets.

Describing the working concept, Golembeski pointed out that “successful execution of the first phase of development – on an accelerated timeline – will enhance the marketability of the remaining gas in the basin, which will make it easier to finance subsequent phases of LNG exports.”

### Intergovernmental cooperation agreement

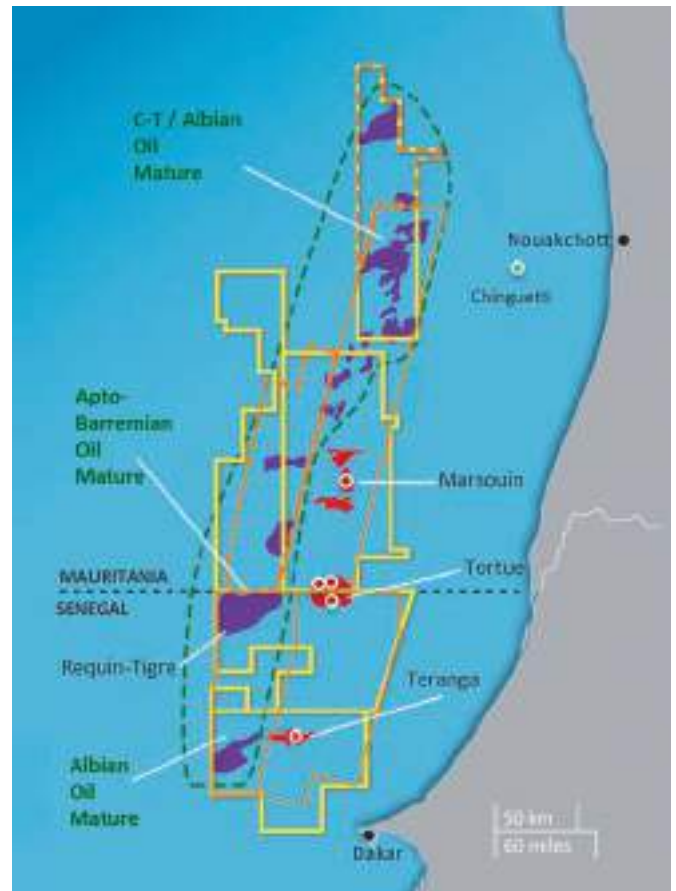
“We have made tremendous progress in a short period of time,” Golembeski said describing progress made with cooperation between the two governments.

The working group has drafted an intergovernmental cooperation agreement between the two nations for the development of the project.

The agreement is based on the Frigg Agreement of 1976 between Norway and the UK and will provide for a 50-50 split of the resource in the beginning, with a mechanism to re-determine the interest based on actual production data once gas begins to flow. The agreement is currently being reviewed by the two governments.

“Once that review is done, it will be sent to the respective legislative bodies for approval and the presidents will sign it and we are hopeful that we will have the intergovernmental cooperation agreement signed by the end of the year,” Golembeski said.

Golembeski added that Kosmos will soon be starting an environmental and social impact assessment (ESIA) to ensure the site and development concept are environmentally sound, and that any potential social impacts are properly addressed. At the same time, work continues to validate the technical viability of the site selected.



Map representing Kosmos Energy’s oil wells in the Senegal-Mauritania border region.

The project is targeting first gas in early in the next decade.

### A promising future

Golembeski explained that apart from pursuing the gas project, the company also has plans to carry out further exploration in the outward sections of its blocks in Mauritania and Senegal, because it believes that there is more hydrocarbon potential there including possibly oil.

Discussing the future of the development project, Golembeski said, “We are looking to bring in a partner because this Mauritania-Senegal basin that we have now opened is very large

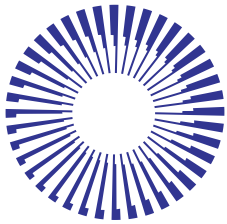
and we expect that it will get even bigger.” The company is in conversation with a number of companies who are interested in partnering with them for both the gas projects and well as the forward exploration programme.

Golembeski is confident about the company’s decision to pursue exploration in the current bleak hydrocarbon market. “We see a demand width opening up beyond 2020-21 time-frame where we can get our gas into the market and it will be competitive with gas anywhere in the world. As far as forward exploration plans go, we see deep water exploration has a role to play in future energy supply and now is a good time to be exploring because costs have come down for drilling activities and with everyone else in the industry cutting back on exploration programmes, we see that as an opportunity.”

**“ The project is targeting first gas early in the next decade.**

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# MORE INVESTMENT ON THE HORIZON FOR CÔTE D'IVOIRE

Investment in the West African nation is expected to lead to growth in the hydrocarbons sector, with help from the effective monetary policy supported by the central bank. Sejal Bhat reports.

**A**CCORDING TO BMI Research, the Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO) will hold rates firm until the end of 2017 as the West African Franc's peg to the Euro and external pressure keep price growth low. This will encourage investment in the eight countries of the Union Economique et Monétaire Ouest Africaine. Investors are expected to favour Côte d'Ivoire and Senegal in the

coming years given the strong growth and fiscal management supported by BCEAO policy.

The hydrocarbons sector is supporting the growth forecast. Two new gas-fields were brought on-stream in block CI-27 offshore Cote d'Ivoire following the completion of a four-year, US\$850mn development led by Foxtrot International.

African Petroleum holds a 90 per cent operating interest in offshore licence CI- 509 and a 45

per cent non-operating interest in offshore licence CI-513. The remaining 10 per cent in CI-509 is held by Petroci, the National Oil Company of Côte d'Ivoire and the remaining 55 per cent in CI-513 is held by Ophir Energy (45 per cent) and Petroci (10 per cent). Investment expert Proshare predicts Brent crude will average US\$53 per bbl in 2017, compared to US\$46.5 in 2016. As oil prices pick up, petrol prices are expected to rise too. ♦

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# MADAGASCAR

## FUTURE ON THE BRINK

Turbulence in Madagascar has caused numerous issues, both socially and within its energy sectors. Kestell Duxbury reports on the country's future in oil and gas.

**T**HE EXXONMOBIL AND Sterling exit from the Madagascan block sparked initial uncertainty, then Madagascar Oil's shareholders deciding to leave AIM and seeking emergency funding caused further doubt about the reserves in the region. J.V Lalaharisaina, minister of mining

and petroleum said: "Exxon has left Madagascar because it was not convinced by the potential of the oilfield." He suggested that small and medium-sized companies may be interested in the sites.

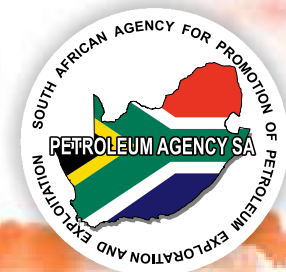
Despite this, Africa Oil and Power is more optimistic of the potential for the oil and gas

sector. The increasing political stability may encourage more foreign investment and interest on top of the 16 international companies working under the 23 licenses currently. It is thought that there are 20bn barrels of oil throughout Madagascar and by 2018, the country should be producing 6,000-10,000 bopd.

There is little movement in the region at the moment, but many medium-sized companies are in a position to benefit the region as long as the short term infrastructure limitations are dealt with so the gains can be realised in the longer term, as long as the political landscape stays constant. ♦

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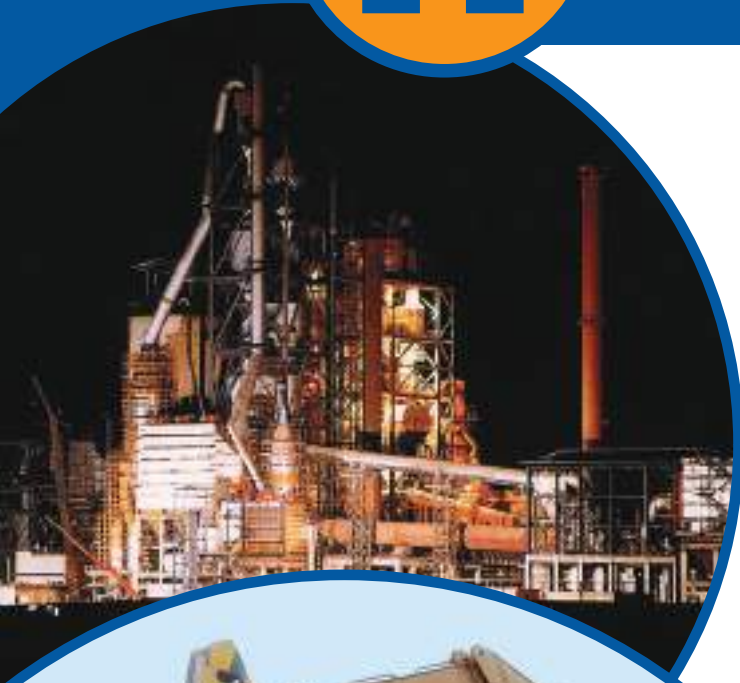
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# PROUDLY NIGERIAN AND EXPANDING INTO NEW AFRICAN MARKETS

Preye Berezi, CEO of PFL Engineering Services, talks to *Oil Review Africa* about the importance of safety, Nigerian local content requirements and meeting the highest international standards as the company expands into Ghana.

## How did PFL Engineering Services Limited start and what was the motivation behind it?

The company started as a normal Nigerian company established by a team of experienced, committed and dedicated Nigerians that saw the need to offer quality service to the oil and gas community. The main motivation was to set up a business that will be a platform for Nigerians to grow in the oil and gas industry and provide unrivalled services that will showcase the physical and technical strength of an average Nigerian.

## What services are proving the most popular among your clients and why do you think this is so?

While we were planning the re-engineering of the company, we wanted to diversify to areas that will remain active for a long time, not minding the cost of crude, and realised that maintenance will always be key in the industry because IOCs might reduce or cancel greenfield projects, but will always need to maintain their brownfield assets so as to remain in business. So we re-organised and developed ourselves in the inspection and maintenance business, which is key for any asset owner that still wants to maintain high level production.



Image Credit: PFL Engineering

*Preye Berezi says that international certifications are important to ensure the company stands out in the industry.*

## Is there more awareness of the importance of safety in the Nigerian oil and gas industry?

Yes, there is a lot of emphasis now by all the IOCs operating here in Nigeria, and it is a good thing as we want our people to be safe and well. There are now

minimum standards every company must attain to be able to execute projects in the industry. On our part, we take safety very seriously and have gone ahead to invest and develop our operating system by securing ISO 18001:2007 from Bureau

Veritas UK. This proves that our laid down processes and procedures on safety conforms with the highest internationally recognised safety standard.

## How important is it for your services to encourage operators to meet local content requirements in Nigeria?

We are a 100 per cent indigenous company and we feel very strongly about local content and encourage it as much as we can. We have ensured we have full international certifications for our company operations and management. We are fully certified in ISO 9001: 2008, 14001:2007 and 18001:2004, all from Bureau Veritas UK, which gives us a fully compliant integrated management system (IMS). We have developed our system in such a way that we will be able to compete with any company anywhere in the world. We have made ourselves attractive so as to ensure that IOCs do not have to bother about sourcing for international companies to render our scope of service here in Nigeria and the sub-region.

## What are the common challenges PFL Engineering is facing in the oil and gas industry, and how do you overcome them?

One of the challenges we face on a daily basis is the price war that has erupted since the cut back in

**“ We are a 100 per cent indigenous company and we feel very strongly about local content and encourage it as much as we can”**

the price of oil. Everyone is now cutting costs as the IOCs are trying to make their operations leaner. You have to be really careful as you do not want cost-cutting to impinge on your quality and safety during operations.

We are lucky because we invested in the essentials of our business, such as personnel, certification and equipment, at the right time so we are able to be very flexible with our prices.

Another area that is still a challenge is our tendering process in Nigeria. Apart from the fact that it takes too long to get a project rolling, IOCs and especially government regulators have to put in more effort and be more upright in the pre-qualification of companies for projects.

We still have too many unqualified companies bidding and qualifying for contracts that they have no technical strength on because they have friends in high places. This will not encourage the need for Nigerian companies to develop their operating systems.

### **Recently PFL received the Lloyds Register-approved service supplier certification. How important are certifications to the oil and gas industry in Nigeria?**

We have not only got our Lloyds Register-approved certification, but we also have ABS and we are about to secure DNV. These are the type of international certifications which make you stand out in the industry, and we aim to be the best.

Certifications are important because they show the strength you have technically. It's like qualifications you gather from going to school.

If our company was a student, we would have been talking about been an Associate Professor with the class of certifications that we have been able to secure over the years after going through rigorous audits by international bodies and agencies.



Image Credit: PFL Engineering

*Meeting Nigerian local content requirements is an important priority for PFL Engineering. Preye Berezi says this is to be encouraged wherever possible and that the company has made itself attractive to IOCs so they do not need to use international companies to meet their needs in Nigeria and the sub-region.*

### **What plans does PFL Engineering Services have for the future?**

We look into the future with so much confidence and enthusiasm. Like I said earlier, we have invested on the essentials of the business a while ago, and are now uniquely positioned to offer first class service in our chosen fields.

Furthermore, we are presently expanding our operations and training base in Port Harcourt to offer valve maintenance services, so we are setting up a valve maintenance workshop.

This is important because we represent one of the biggest manufacturers of specialist valves in the world, IMI CCI of the USA, and we are also channel

partners to Draeger Safety, which is another household name in the world of safety and firefighting. To service our safety clients, we are setting up an ultra-modern safety centre in Port Harcourt where we will be able to calibrate safety equipment such as gas detectors, BA sets and diving sets. We have so far achieved 70 per cent completion and plan to commission these two projects in December this year.

We have invested heavily in equipment and construction to ensure we can compete with the best in the business. We are looking at new innovations and we have recently added drone technology to our profile. We believe to be the best you must keep up with technological development.

Recently, we exported our business beyond the shores of Nigeria by establishing in Ghana. We plan to work with reasonable and committed Ghanaians and set up a training center in Takoradi, Ghana, early next year. ♦

*PFL Engineering Services Ltd. is an independent company, established in 2002 as Perfect Facilities Ltd. The main focus of the company was to provide skilled technical manpower and logistics support services to the oil and gas, petrochemical, energy and marine sectors. In 2008, the company was re-engineered and the name was changed to PFL Engineering Services Ltd. The scope of service also increased from technical manpower supply and logistics to access, inspection and maintenance (AIM); as well as technical manpower and training services.*

*After starting off as a company providing technical manpower, the focus then was to provide top quality technical manpower and logistics support services to the oil and gas community in Nigeria. Today, PFL has diversified its business and now providing AIM and repair services. The company specifically assesses, inspect, maintain and repairs any asset that is used for oil and gas exploration and production, as well as the refining of petrochemicals, be it an FPSO, drilling rig, mobile production unit, service vessels, refinery, pipelines, storage tanks etc.*

*Under the AIM business, we specialise in accessing difficult areas, confined spaces and inaccessible areas such as cantilever helidecks and platform bridges. PFL utilises its specialist knowledge in preparing solutions which give the client the best and safest access using rope access, scaffolding and tension netting. After successfully accessing an area, PFL staff then carry out inspection, conventional or advanced inspection, utilising solutions like non-destructive testing (NDT), lifting equipment inspection, aerial inspection (with the use of drones), based on the findings and reports, PFL can then prepare a detailed scope of work for the client. Following on, the company can then provide maintenance and repairs on areas of concern as identified in our scope of work, utilising fabrication, blasting and painting, coating, passive fire protection and emergency response services.*

*PFL also provides training services and this is considered to be the most fulfilling part of the business. This is because while providing manpower to IOC to support them in the execution of their various projects, PFL had the opportunity of speaking with project managers in the industry and understanding the sort of skill sets and qualifications they were looking for. Unfortunately, most Nigerians didn't have the required training and qualifications required to suit those roles so PFL was compelled to fly in expatriates from other countries to carry out specialised services in Nigeria. This need, and the advancement of the Nigerian Local Content Act, motivated PFL to set up its training centre in Port Harcourt. The training centre is set up to international standards with full accreditation from international accrediting bodies, such as Irata, LEEA, ASNT, NACE and OGTAN, to train on areas like rope access, NDT, scaffolding, blasting and painting, lifting inspection. Because the company is accredited by world governing bodies, the certificates that are issued to all trainees can be used in any country in the world.*



# ULTRASONIC LEVEL MEASUREMENT AS A NEW ALTERNATIVE

Magnetrol is leading the way with advanced ultrasonic level measurement technology for liquid level applications. An international oil and gas company has experienced the benefits of this technology.

**U**LTRASONIC LEVEL MEASUREMENT is an advanced technology that can be used as an alternative to the traditional tuning fork or vibration technologies in liquid level applications. One of the world's leading oil and gas companies needed a reliable low level alarm in a propane stripper. Their refinery had been using tuning fork or vibration technology, but this technology failed due to the low density of the liquid propane (429 kg/m<sup>3</sup> or 0.429 SG). Magnetrol proposed its Echotel® Model 961, an ultrasonic level measurement technology that is immune to low or changing density without the need for calibration or reconfiguration. It operates independent of varying density, dielectric, and thermal conductivity.

The 961 allowed for reduced wiring costs by providing an alternative to relays. It is a two-wire, loop-powered device with a current output. The current output shifts from 8 mA during normal operation to 16 mA upon level alarm. If a fault condition or failure occurs, the current will go low or high per NAMUR NE 43. A failure can be simulated as well through a manual self-test that is available from the bezel.

Plant personnel receive unparalleled visibility into the operation of the 961 to prevent



*The Magnetrol Echotel Model 961 is revolutionising liquid level measurement for oil and gas operators.*

undetected level alarms, thereby increasing the efficiencies and safety of the refinery.

Included in the safety requirements of the refinery was the need for Safety Integrity Level (SIL) 2 rated devices. Both

the single-point 961 and the dual-point 962 are suitable for use in SIL 2 loops. The 961/962 has unique diagnostics to assist in troubleshooting should a failure occur. Aside from the manual self-test, the

**“ This advanced technology can be used as an alternative to traditional tuning fork or vibration technologies in liquid level applications ”**

microprocessor in the electronics continuously monitors all self-test data. Should a fault occur, the microprocessor can determine whether the malfunction is due to the electronics, transducer, or the presence of environmental noise. The primary sensors in the transducer are the crystals and they are continuously monitored. For accessibility, safety, and ease of use, the electronics can optionally be remote-mounted from the transducer.

The success of the Magnetrol Echotel 961 in the low density propane stripper has opened the door for other ultrasonic opportunities, such as level detection of sour water in an acid gas knockout drum. ♦

*To learn more about applications and benefits of ultrasonic level measurement technology, visit [echotel.magnetrol.com](http://echotel.magnetrol.com).*

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# ENSURING QUALITY OF LIFE FOR OFFSHORE EMPLOYEES

Maintaining high standards for offshore employees, such as catering and accommodation, has positive effects for operators in terms of safety, engagement and productivity. Alice Hoffman, from Sodexo, shares her views on the importance of offshore quality of life. By Georgia Lewis.

**L**IVING AND WORKING offshore presents challenges for operators in terms of ensuring quality of life for employees. From meeting catering challenges so that all dietary requirements are met to ensuring sleeping arrangements are comfortable and appropriate and many more besides, offshore quality of life is important for staff morale and retention.

Leading services company, Sodexo, conducted the Offshore Employee Quality of Life study. It is the culmination of work that began in 2009 by identifying quality of life factors. The study was first launched in 2012, and findings from the fifth edition of the study will be released soon.

“The biggest difference between offshore and other work environments is that employees are in the workplace virtually 24 hours a day – in an enclosed area, surrounded by the sea,” said Alice Hoffman, Sodexo vice president of global business development, Offshore and Marine. “Even when compared to other remote locations, such as mines, the offshore setting is very extreme because there is no way to escape – people can end up feeling restrained. There are many other contributing factors such as lack of privacy, isolation and monotony.”

Trends have emerged from the studies, according to Hoffman. These include more



*Working offshore can be an isolating experience for oil and gas employees.*

personalised expectations from employees, especially for food and leisure. She cited healthy



*Alice Hoffman outlines the importance of quality of life for offshore staff.*

eating: “If we look at healthy eating, for example, this is a very big trend that we see around the world. But if we examine the figures more precisely, the maturity towards nutrition or healthy eating varies quite a bit between generations and regions. We need to be careful not to equate big trends with standardisation because while it may exist everywhere, it does not impact everyone in the same way. As younger generations are, in general, more educated or interested in the impact that diet can have on the body, they tend to have higher expectations around healthy eating options.”

An example of a personalised catering service Sodexo is offering is integrating a paid

premium coffee service in addition to the standard coffee as the studies found people are willing to pay for such services.

Operators are seeing the advantages of improving offshore living quarters, with more welcoming living quarters as a means of improving the mood of employees, and this has a knock-on effect on safety, engagement and productivity.

“Aesthetically, rigs are very clinical and standardised and all rooms are exactly the same – constructed with steel and white plastic,” said Hoffman.

“But again, this survey shows that the needs and expectations around creating a comfortable and welcoming environment are growing.”

Hoffman said the study raised client awareness of quality of life issues and allowed the voices of employees to be heard.

“A great example of this goes back to dining expectations,” said Hoffman. “Our clients often think that their employees want all-you-can eat meal options; but our survey shows that only 29 per cent of the workforce wants this, versus 45 per cent who would really like to have access to a healthier food offer. Presenting these trends to our clients surprises them and makes them think and react differently. The wow effect is amazing.” ♦

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# MINIMISING BUSINESS INTERRUPTION WITH GOOD FIRE SAFETY MANAGEMENT

Best practice fire safety management is essential to protect employees, reduce downtime and to avoid costly insurance claims. Amalia Illgner spoke to experts in the field about the latest innovations to help oil and gas operators.

**W**ITH NEARLY TWO thirds of all global claims, fire and explosion is the leading cause of “business interruption”, according to the latest report by insurance giant Allianz. And it’s no surprise that it’s the same story in the energy sector with “fire and explosion” standing as the number one cause of loss – by both the number and the value of claims.

So what measures are the leading fire safety experts taking to reduce the risks and loss associated with fire, and what is the latest thinking in terms of best practice and innovation?

Steve Watkins, a senior consultant for Falck Fire Academy, the world’s leading provider of workplace-related safety courses and safety services, with a focus on the offshore and maritime sectors says: “Fire safety will be increasingly

**“Fire safety will be increasingly controlled by smart, digital fire and gas and smoke detection, as well as fully automatic fire extinguishing systems”**



*A platform caught fire in Bayou Sorrel, Louisiana, in March this year while in the process of being dismantled.*

controlled by smart, digital fire and gas and smoke detection”. He also predicts we will see more oil and gas process installations with high risks of gas release being equipped with “fully automatic fire extinguishing systems”.

Andy Gibbins, CEO and founder of the UAE-based firm GLAS, which provides high level consultancy to the oil, gas and petrochemical sectors, believes the real solution is to prevent “loss of containment”. “This means the prevention of flammable liquids and gases from being released from piping and equipment”. According to

Gibbins, this solution comes from good design and operational standards.

Nikkii Ng, a principal consultant at Lloyd’s Register (LR), a global engineering, technical and business services organisation, providing risk and consultancy services, believes that best practice begins with the right approach from the outset. She says: “The best time to apply the principles of inherent safety is during the early stages of a design”. She argues that firms need to step back and visualise offshore platforms for what they really are: “Floating cities that

produce highly hazardous chemicals 24 hours a day.”

That is why LR has launched a Joint Industry Project (JIP) to investigate how best to reduce the potential explosion and fire risks from hydrocarbon leaks in gas turbines. “Companies and universities across the world are collaborating in this new initiative to improve awareness on how to optimise safety design.” Some of the collaborators on the project are: ConocoPhillips Skandinavia AS, Maersk Oil and Gas AS and Statoil AS, along with General Electric O&G.

But it's not only design and infrastructure innovation that can be improved. Ng is clear that infrastructure "assets" are now generally safer by design and it is widely accepted by the modern safety expert that "at least 80-90 per cent of major incidents" are caused by human factors. She says that training and managing "human factors" aboard offshore installations is as crucial as the right infrastructure and management systems. "A positive safety culture is essential, particularly in an environment where you have long, demanding shifts, difficult working conditions and a very high potential for fatigue."

Watkins, who is also a former UK fire officer with more than 20 years' experience, believes major global incidents such as Deepwater Horizon has made

**“ The best firms are re-thinking how they create a positive safety culture and this has resulted in innovative ways of approaching training”**

firms re-think staff training. He says that previously there were only fire suppression systems installed to the regulation requirements. But now, he says, there is more emphasis on quality training to deal with credible scenarios. "A good example is the Management of Major Emergencies (MOME) training for the offshore installation managers (OIMs) on offshore installation."

But Ng says that understanding the "human element" is complex and she thinks "we are only beginning to recognise the influence of the workforce in efficient - and therefore safe - operation of offshore assets". But, she says, there are clear trends emerging.

She says the best firms are re-thinking how they promote their "positive safety culture". This has resulted in innovative ways of approaching training. "The emphasis is shifting away from a reliance on the deployment of company 'safety police' in favour of employee engagement tools such as incentives, which give workers a stake in the process."

However, quality training is a significant investment and the drop in the crude oil price has affected profitability in all companies. Gibbins believes this is a "serious challenge" for the industry across the Middle East



Image Credit: ideum/Flickr

*Lessons have been learned from the Deepwater Horizon disaster in 2010.*

and Africa. "Companies have been forced to make budget cuts, which have impacted on staffing levels, investment and discretionary spending on things such as training."

Gibbins sees a worrying trend in the Middle East and Africa. "Across both regions, companies are reducing numbers of highly experienced expatriate staff. This means that a lot of knowledge is leaving companies. This coincides with cutbacks in training." He is worried about the

risk of falling standards. "We are already seeing increased incidents of 'force majeure' associated with safety issues, being reported by companies - indicating unforeseen loss of ability to supply to their customers".

Watkins is equally concerned. He says that "training of personnel is sometimes seen as 'lost money'. But he is reminded of the saying "if you think training is expensive, try a real incident". ♦



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*Saudi Aramco will not require EOR for some time, but the company is still looking ahead with research.*

# SPE ENGINEERS DISCUSS EOR AND DATA ANALYTICS

Image Credit: Saudi Aramco

**T**HE SOCIETY OF Petroleum Engineers (SPE) held their annual technical conference in Dubai. Multiple speakers addressed the event on enhanced oil recovery, with the focus on challenging oilfields particularly relevant for many African operators. Data analytics can also help operators work more efficiently and these presentations were interesting for operators from around the world.

## Enhanced oil recovery (EOR)

Sunil Kokal, Modiu and Almohannad Alhashboul, representing Saudi Aramco, gave a presentation on the design and implementation of the first CO<sub>2</sub>-EOR for demonstration project in Saudi Arabia.

While Saudi Arabia will not require EOR for decades to come, this Saudi Aramco project is still an important one as it demonstrated the feasibility of sequestering CO<sub>2</sub> through EOR, and using it as grounds to test new monitoring and surveillance techniques. The project had two components – the actual EOR process, which took part in a small part of an oilfield, and the CO<sub>2</sub> capture plant.

Main objectives of this project include the estimation of

sequestered CO<sub>2</sub>, determination of incremental oil recovery, and addressing risks and uncertainties, such as migration of CO<sub>2</sub> within the reservoir and operational concerns. It is estimated that around 40 per cent of the injected CO<sub>2</sub> will be sequestered permanently in the reservoir.

The project uses 40MMscf/d of CO<sub>2</sub>, which is being captured, processed at an existing facility and piped about 85km to the field location. An infill line drive

has been used to take advantage of the east-west fluxes in the field. This includes a row of four injectors and four producers, and observation wells for monitoring and surveillance. CO<sub>2</sub> is injected into a water-alternating gas mode and the monitoring and surveillance programme has been implemented to evaluate the performance. This also deploys new technologies, such as seismic, inter-well tracers, gravity, geochemical sampling and analyses.

Another presentation involved representatives from four companies. Ransis Kais from Apache Corporation, Vidar Mathiesen and Haavard Aakre from InflowControl, Glenn Woiceshyn from Absolute Completion Technologies, and Amr Elarabi and Ricardo

**“ The Saudi Aramco enhanced oil recovery project was made up of two components – the actual EOR process, and the CO<sub>2</sub> capture plant”**

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Hernandez from Schlumberger, collaborated on an EOR water and CO<sub>2</sub> injection scheme project.

The project's focus was on the significant challenges presented by short-circuiting of CO<sub>2</sub> gas and water between injectors with EOR schemes that utilise CO<sub>2</sub> and water injection. This can often leave a significant trail of oil behind. The presenters described to the conference the description and results of a field trial of new downhole flow control technology designed to provide autonomous inflow control of produced fluids from each zone in multi-zone wells.

The new technology deployed by the engineers involved integrating an autonomous inflow control valve (AICV) and a conventional inflow control device (ICD) in a unique three-position sliding sleeve, shifted by coil tubing to allow performance comparison between the two devices. The AICV was designed and lab-tested to selectively choke back or shut off flow of free CO<sub>2</sub> gas and high watercut.

It was found that reservoir sweep was significantly improved and higher oil production was yielded with the AICV.

A joint project by Total ABK, Total SA and Total US was presented on offshore chemical EOR pilot project in a high-salinity, high-temperature environment. The paper was based on a 2014 surfactant-polymer one-spot pilot offshore to test the effectiveness of in-house-developed surfactant molecules to mobilise trapped oil. The paper is the culmination of several years of R&D and focused studies on an offshore light oil field of the United Arab Emirates.

The EOR options considered were water-based techniques, either by optimising the composition of the injected water or by using chemicals; and tertiary gas injection, preferably miscible injection, to obtain a significant decrease of the residual oil to water, with CO<sub>2</sub>



Image Credit: Kevin Phillips

*Leveraging data through accurate analysis and easy access is more important than ever for oil and gas operators.*

and carbon gas being considered. It was the world's first pilot of this type in in such harsh offshore conditions.

The pilot was considered "quite successful" because it was safely conducted, and it targeted the development of EOR chemicals able to withstand low interfacial tensions, as well as high salinity and temperature. The pilot concluded that "very significant" desaturation was proven by two different techniques, but some injectivity issues were still faced.

A multi-well pilot will be the next step in order to demonstrate that the chemical formulation can propagate efficiently from an injector to a producer, mobilising oil bank that is observable at the producer or producers. This sort of pilot would also provide calibration data for modelling and upscaling to larger field implementation.

#### Data analytics

On behalf of the Abu Dhabi Company for Onshore Petroleum Operations, Richard Mohan David gave a presentation on an

approach towards establishing unified petroleum data analytics for enabling data-driven operations decisions.

The presentation highlighted that operators need to harness data analytics to identify patterns, trends, correlations, and forecasts from vast petroleum data to extend the present limits of the digital oilfield. This includes exception-based surveillance, case-based reasoning, and condition-based monitoring in order to facilitate advanced monitoring and strategic decision-making.

David's presentation advised systematic capture, storage and

management of data, integrating and embedding data analytics into the mainstream sub-surface, drilling, production and operations workflows, which includes reservoir monitoring, drilling and production optimisation.

He went on to say that data analytics technology blends traditional data analysis with sophisticated algorithms and business rules for processing large volumes of diverse data through an integrated data analytics environment (IDE). Data governance is essential to IDE to ensure clear ownership and responsibilities as the accuracy of the results are as good as the quality of the data.

An integrated data analytics platform enables integrating E&P workflows and data analytics to enhance operations monitoring, predict well productivity, identify performance patterns and KPI, improve reservoir recovery, and predict equipment failure, towards achieving continuously optimised oilfield performance. ♦

**“ Operators need to harness data analytics to identify patterns, trends, correlations, and forecast from vast petroleum data”**

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# UPDATING BEST PRACTICES FOR PIPELINE SYSTEMS

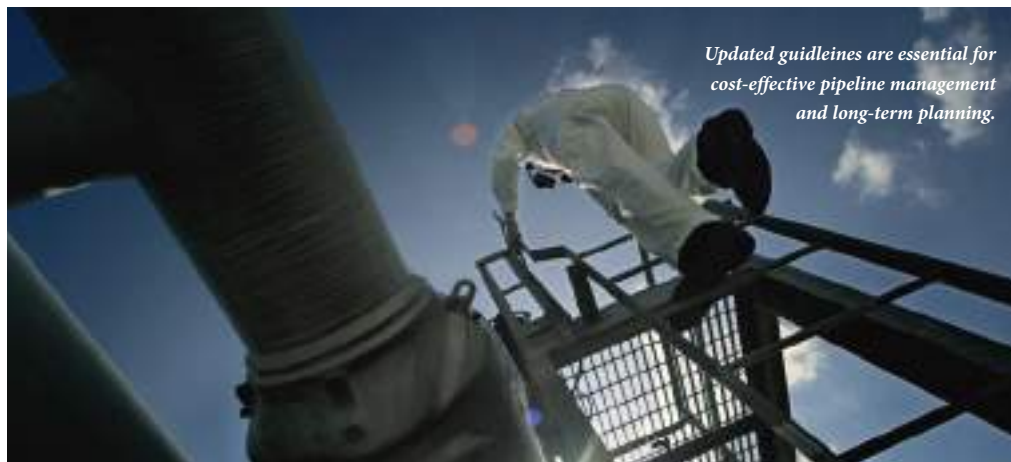
DNV GL has worked with industry partners to update recommended practices for pipeline management. This has been done with the aim of reflecting the ever-changing industry and ensuring more effective operations.

**T**O REFLECT THE changing needs of the industry, DNV GL has worked together with its industry partners to update two recommended practices (RP). The first for corroded pipelines (DNV-RP F101) and the second for integrity management of submarine pipeline systems (DNV-RP-F116).

The updates have been developed through the completion of joint industry projects (JIPs). The revisions aim to further support the decision-making processes related to maintaining the integrity of pipeline systems in the following areas:

- Extension of in-service operation.
- Costly repairs and replacements.
- Long-term planning of activities based on balanced evaluations of both technical and non-technical issues.
- Continuous improvement of integrity management systems.

Anne Britt Høydal, principal engineer – pipelines & materials, DNV GL Oil & Gas, says: “By its very nature, the pipeline sector is constantly evolving to meet regulatory requirements, address technology advances and react to an often volatile economic market. Likewise, recommended practices must keep ahead with these changes.



*Updated guidelines are essential for cost-effective pipeline management and long-term planning.*

Image Credit: DNV GL

“The latest revisions to two RPs for the pipeline sector will help ensure that best practice is adhered to and that decision-makers have the most appropriate guidelines at their fingertips.”

First issued in 1999, the latest update to DNV-RP F101 includes a new assessment methodology on how to estimate the pressure resistance of a pipeline containing long axial grooving (the methodology is also applicable for pipelines with other patterns of internal corrosion), and assessment of internal corrosion development with time.

Updates have also been made to achieve better compliance with the newest edition of the offshore standard DNV-OS-F101 rev. 2013-10, e.g. with regard to pressure definitions and terminology, characteristic

material properties, partial safety factors and fracture values, and supplementary material requirements.

Integrity management is climbing further up the agenda as the industry looks to get the most from life extension of ageing pipelines. Corrosion in particular poses a major threat to these pipelines. Revisions to DNV-RP F101 aim to improve corrosion defect assessments, through thorough probabilistic evaluation, corrosion development evaluations and pressure resistance calculations accounting for system effects.

The February 2015 revision of DNV-RP-F116 provides more comprehensive guidelines on carrying out risk assessments. Guidelines regarding integrity management reviews as well as recommendations for identifying key performance indicators have

also been revised and updated. These can be used to further develop risk assessment methods for company governing documentation.

“The listed indicators in the RP are based on a combined integrity management and barrier philosophy mindset where barriers to risk can be seen as preventative and reactive. The updated RP provides guidelines on how to further embrace technical, human and organisational elements working together. This will provide a valuable framework to deliver risk evaluations for planning integrity management activities,” continues Høydal. DNV GL will be hosting a number of seminars in Norway to present the revisions to the RPs. ♦

[www.dnvgl.com](http://www.dnvgl.com)

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# TOP LEVEL SPEAKERS URGE POSITIVE CHANGE AT ADIPEC 2016

Industry leaders will converge on Abu Dhabi at this year's ADIPEC event, encouraging stakeholders to collaborate and embrace change in the new energy landscape for greater operational efficiency.

**OIL AND GAS** industry leaders from around the world will be calling for greater collaboration and an increased focus on operational efficiency when they speak at the 2016 edition of ADIPEC, the Abu Dhabi

International Petroleum Exhibition and Conference.

Patrick Pouyanné, chairman and CEO of Total, speaking ahead of his address at ADIPEC, said that industry stakeholders must work in unison to create a sustainable energy future.

"The global energy landscape is witnessing a rapid change, influenced by economic challenges and efforts to reduce carbon emissions, which can be addressed by the emerging role of natural gas and renewables," he said. "All of this makes it crucial that industry players operate not only more efficiently, but also more closely, in a spirit of cooperation."

With BP's Energy Outlook report pointing out that fossil fuels will remain the dominant form of energy powering global expansion for the next two decades, ADIPEC is timely. The report adds that the global fuel mix will change with gas emerging as a major resource.

Jeff Miller, president of Halliburton and another speaker echoed the BP report, saying: "Hydrocarbons are, by far, the most affordable and abundant resource for advancing the progress of human life and play an integral part in meeting the world's growing demand for energy."

Vicki A. Hollub, president and CEO of Occidental Petroleum Corporation and a speaker at the event, said: "ADIPEC is one of the premier oil and gas conferences, bringing energy leaders together from around the world."

There will be a strong focus on the role of women, with the Women in Energy event on the

third day. Fatema Al Neami, manager of the gas strategy and master planning unit at the Abu Dhabi National Oil Company and a speaker at the women's event said that although women have come a long way, especially in the UAE, "we still have a long way to go as there are many challenges that need to be addressed".

"These challenges are not just specific to this country or the region but are global obstacles that the industry is facing every day. They are also both physical and socio-psychological in nature, from creating supportive corporate infrastructures to inspiring women to be part of the industry's future developments."

According to a report by Reuters, the oil and gas industry has the lowest representation of female professionals among all employers.

Other confirmed speakers include Dr Sultan Ahmed Al Jaber, UAE Minister of State and CEO of the ADNOC group of companies, Rex W. Tillerson, chairman and CEO of ExxonMobil Corporation, Bob Dudley, CEO of BP, Alexander Medvedev, deputy chairman of Gazprom, and Paal Kibsbaard, chairman and CEO of Schlumberger. ♦

*The conference will be held in Abu Dhabi from 7-10 November at the Abu Dhabi National Exhibition centre. [www.adipec.com](http://www.adipec.com)*

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# EXTRA LONG LIFE FOR MULTI GAS DETECTOR

Leveraging infrared technology means this exciting new device offers users excellent battery life, which is ideal for emergency situations and remote locations. Additionally, it offers extremely accurate gas detection for improved operational safety on oil and gas projects.

**M**ULTI GAS CLIP Infrared (MGC) 4-gas detector for LEL, H<sub>2</sub>S, CO and O<sub>2</sub> by Gas Clip Technologies is proving to be one of the most technologically advanced portable multi gas detectors on the market. This detector can run for two months straight on one charge. There's no need to stop and charge the detector after 12 to 15 hours of operation, saving valuable time and ensuring continual safety compliance.

During a power outage, an emergency situation or when easily charging a detector is not an option, this long-lasting detector offers uninterrupted protection for users.

The extended battery life comes from the utilisation of low power photometric infrared technology for LEL measurement. This replaces archaic pellistor technology, which has been around since the 1950s. However, infrared technology is not new.

Gas Clip Technologies has pioneered the development of the technology to create the unique beneficial features that are found in the Multi Gas Clip line.

One benefit, besides longevity of battery life, is that the detector doesn't have to be calibrated or bump tested frequently because the infrared LEL sensor doesn't change over time and is immune to catalytic poisons such as H<sub>2</sub>S



*This detector has an extremely long battery life, running for two months straight on one charge.*

**“ The use of infrared technology replaces archaic pellistor technology, which has been around since the 1950s”**

and silicones. Recommended calibration is once a year. If the sensor fails for any reason, the detector will let you know immediately.

Another benefit is the accurate detection of toxic gas in oxygen-depleted or oxygen-enriched environments. Since infrared is a beam of light, not a bead-and-filament system, as in a pellistor, it is not dependent upon oxygen to burn. Maintenance and downtime are greatly reduced as well because the infrared LEL sensor doesn't have a bead that can heat up and burst when there's a sudden high gas exposure and it doesn't have a fragile filament that can break when the detector is dropped.

Each detector is 100 per cent quality control-tested to ensure reliability and protection. Standard features include simple, one-button operation, data logging, high viewing angle alphanumeric liquid crystal display, full function self-test upon activation, and visual, vibrating and audible alarms. Multi Gas Clip Infrared is compatible with the MGC Dock for easy bump testing, calibrating, data logging, and programming of up to four detectors at a time within a few minutes with a simple snap into a bay and the push of a button. ♦

Image Credit: Gas Clip Technologies



# AFRICAN RIG COUNT - 2016

COUNTRY	August 2015	September 2015	August 2016	September 2016
ANGOLA	16	19	10	10
EGYPT	15	14	9	9
NIGERIA	12	12	6	7
GABON	6	6	0	0
CONGO (BRAZZAVILLE)	3	3	2	2
GHANA	3	3	2	2
CAMEROON	2	2	1	0
TUNISIA	1	1	2	2
SOUTH AFRICA	2	1	1	1
CÔTE D'IVOIRE	1	1	1	1
LIBYA	1	1	1	1
MAURITANIA	1	1	0	0
TANZANIA	0	1	0	0
<b>Grand Total</b>	<b>63</b>	<b>65</b>	<b>36</b>	<b>36</b>

Source: Luke Davis, Infield Systems

## New oil-in-water analyser from Mirmorax offers portability and accuracy for operators

MIRMORAX, THE NORWEGIAN-BASED provider of subsea and topside sampling and monitoring systems, has launched a desktop oil-in-water analyser, the DT250. This device uses ultrasonic technology, and offers flexible, accurate analysis, and live measurements of oil and solids in produced water. It is the result of extensive research by the company.

The main benefits are improved monitoring capabilities, the flexibility to remove bottlenecks from various stages of the processing system, enabling the targeted use of chemicals, and helping make it easier for operators to meet environmental requirements.

Additionally, the DT250 could be a boon to operators working in challenging fields that host separation from different tie-backs with various oil types in the same produced water.

It simultaneously detects oil and solid particles, calculates the mean size of oil particles and solids, and provides information in a portable device. The device offers a low-maintenance system that is quick to set up



*This device is portable and highly accurate.*

and can be used as a sample analyser or bypass analyser that provides continuous measurements. It is also capable of analysing

water that is freshly produced or has been stored for a longer time.

It is based on ultrasonic measurements, in which individual acoustic echoes are characterised using advanced signal processing.

The highly focused signal is transmitted directly into the produced water and the reflection and absorption of the signal provides measurements.

Mirmorax CEO May Britt Lilletvedt says she hopes that in the current low oil and gas price environment, the DT250 will offer operators a “flexible, cost-effective and accurate

monitoring of oil in water to ensure optimal operations, effective separation and environmental compliance”, which she says have “never been more important.”

[www.mirmorax.com](http://www.mirmorax.com)

## NETCO completes LPG FSO project

NETCO, A NIGERIAN provider of design and engineering services, has successfully completed a project for one of Nigeria's leading IOCs.

The contract, awarded to NETCO in 2015, was to carry out a facility information project on the IOC's floating storage and offloading (FSO) vessel. This involved data gathering, desktop studies and the creation of intelligent 3D models.

The FSO vessel is the world's first steel-hulled, new-build LPG FSO constructed for an offshore Nigerian gas field. The vessel converts propane and butane components of the gas stream into liquid products, which are stored in the tanks of the FSO hull prior to being offloaded to LPG tankers.

NETCO commended the project by sorting through all existing information. Gap assessment and gas closure activities involved identifying missing information and documents and initiating measures to either generate, retrieve or update them.

For information-generation and verification activities, NETCO used laser scanning technologies to create a point cloud dataset and an intelligent 3D model using AVEVA software. The software was vital for supporting NETCO's facility information work scope by transforming the point cloud dataset into an intelligent base model that was then transformed into 2D As-Built documents.

The project was completed in under a year with an updated master document register for the vessel being sent to the client for validation and sign-off.

## Water treatment technology awaiting US Coast Guard approval

OIL AND GAS operators seeking technology to improve the water management aspect of production may benefit from the Alfa Laval PureBallast water treatment system.

Alfa Laval has filed for US Coast Guard approval for the system. This follows on from successful completion of land-based tests with marine, brackish and fresh water, which took place in mid-2016.

These tests were performed using the CMFDA/FDA (staining) method approved by the US Coast Guard and were conducted at DHI in Denmark. The testing involved the same hardware, power consumption and flow as the IMO-approved version of the PureBallast 3 family.

A test report package has been finalised by the DNV GL

Image Credit: Alfa Laval



*The water treatment system has already passed rigorous testing procedures.*

independent laboratory.

"We were confident that PureBallast would deliver high-performance results without any change to its components or system design," says Anders Lindmark, general manager, business centre, for PureBallast. "Test results have now been

submitted and they conclusively demonstrate that PureBallast provides reliable biological disinfection at full flow in all water salinities. The system has also met the rigorous mechanical and electrical testing verification schemes required by the US Coast Guard and IMO."

## Successful 3D multiclient reimagining programme used in Mexico

A NEW 3D multi-client reimagining programme has been successfully created for southern Mexican offshore operations in a collaboration between Schlumberger and ION. It is a 3D reimagining broadband programme which uses Mexico's

National Hydrocarbons Commission (CNH) data library. The Campeche 3D re-imagining programme comprises three survey areas covering approximately 82,000km<sup>2</sup> in the Bay of Campeche. Like many African offshore plays, the

Campeche 3D project involved complex and variable geological areas which required a set of consistent, advanced workflows to maximise bandwidth. This needs to be achieved while producing data with strong low frequency content for subsalt areas.

High-resolution steep dip reverse time migration (RTM) and Kirchoff imaging algorithms produce data which can then be used for prospect identification and exploration.

ION president and CEO Brian Hanson commented: "The Campeche 3D reimagining programme area is in one of the most challenging, yet prospective regions offshore Mexico, where we have significant processing experience and expertise."



Image Credit: MASA Johnson/Fiber

*The Bay of Campeche, which has been successfully reimagined in 3D.*



## Hydrotreating catalysts for cleaner-burning fuel

HONEYWELL UOP HAS introduced a new portfolio of hydrotreating catalysts for removing impurities and contaminants from petroleum and refining feedstocks. This will produce cleaner-burning gasoline and diesel, meeting global emissions regulations.

The regulations, which can be met with the assistance of these new catalysts, include Euro V, China V and India's BS-VI. All of these specify less than 10 parts per million of sulphur in transportation fuels.

Hydrotreating is an important step in the refining process. This is when hydrogen and proprietary catalysts are used to

pre-treat feedstocks to remove sulphur, nitrogen, metals and other contaminants before conversion into transportation fuels. The process helps produce cleaner-burning fuels.

The new range features more than 20 hydrotreating catalysts for applications such as hydrocracking, fluid catalytic cracking (FCC), diesel and kerosene hydrotreating, and coker naphtha hydrotreating.

Additionally, Honeywell UOP offers catalysts for naphtha hydrotreating and FCC desulphurisation.

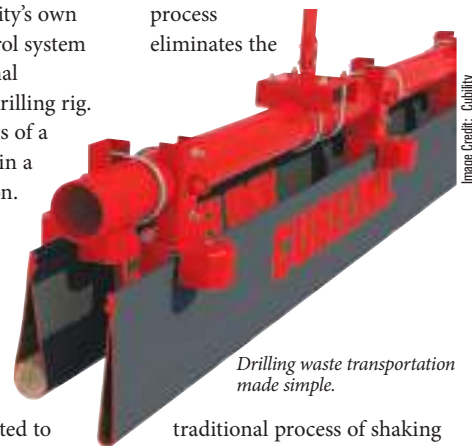
The catalysts will be manufactured at Honeywell UOP's facility in Shreveport.

## CubeLink for improved drilling waste transportation

CUBELINK, A NEW technology from Norway-based Cubility, is a cost-effective way to transport drilling waste directly from shale shakers or from Cubility's own MudCube solids control system to a storage unit or final processing unit on a drilling rig.

The system consists of a recurring belt shaped in a drop-belt configuration. This opens up in a U-shape in the feeding station to receive drilling waste that is fed in by gravity from shakers or MudCubes. The belt is then closed and routed to the destination. Then, the belt

opens up and returns flat over a turning roller where the drilling waste drops by gravity into a receptacle, such as a skip. The process eliminates the



Drilling waste transportation made simple.

traditional process of shaking fluids and solids.

## New generation flame-resistant, weatherproof jacket for oil and gas workers

W.L. GORE & ASSOCIATES has launched its first outwear range designed specifically for workers in the oil and gas industry.

Best known for creating GORE-TEX fabric, which is waterproof, windproof and breathable, the company has now introduced GORE FR Apparel.

This range features another trademark Gore fabric, GORE-TEX PYRAD, a flame-resistant weatherproof fabric which has been designed with wearer comfort as the top priority.

The company recognised that oil and gas workers have a demanding set of needs with their all-weather outerwear. The jacket features a bib and detachable hood to offer

*Designed to protect in all weathers as well as being fireproof.*



protection from incident flame exposure as well as wet and windy conditions.

Using the same technology as DRE-TEX, the GORE FR range meets multiple international safety standards and, for added protection in dark conditions, the jackets come equipped with reflective properties.

"Simply put, GORE FR Apparel is a best-in-class line of foul-weather outerwear products that will deliver an unprecedented performance-to-value solution for our customers in the oil and gas markets," said Sean McDearmon, market development champion for Gore. "A new performance benchmark has been established."

The range was launched at the National Safety Congress in Anaheim California, on 17 October.

[www.goreprotectivefabrics.com/oil-gas](http://www.goreprotectivefabrics.com/oil-gas)

## Plans for riserless abandonment system

THE SUBSEA SERVICES Alliance, a collaboration between Helix Energy Solutions Group and Schlumberger announced the launch of the first riserless open-water abandonment module (ROAM).

The 18½-inch large bore system will enhance well abandonment capacity from a well intervention vessel by allowing tubing to be pulled in open water in a safe and environmentally contained manner.

This system will be engineered and built at the OneSubsea manufacturing facility in Aberdeen. The system, which will complement existing intervention riser systems and subsea intervention lubricators, is expected to be available in the third quarter of 2017.

# Schlumberger and ION Announce New 3D Multiclient Reimaging Programme Offshore Southern Mexico

SCHLUMBERGER WESTERNGECO AND ION Geophysical Corporation have announced a new 3D multiclient reimaging broadband programme offshore Mexico, which uses Mexico's National Hydrocarbons Commission (CNH) data library.

The Campeche 3D reimaging program comprises three survey areas covering approximately 82,000 km<sup>2</sup> in the Bay of Campeche offshore southern Mexico.

Leveraging both companies' extensive imaging experience in Mexico, the programme will be processed using both custom technologies and techniques from the two organizations which will maximize data quality and offer geological insights for upcoming licensing rounds.



WesternGeco and ION expand the Campeche multiclient reimaging program to cover the shallow water Round 2.1 blocks.

The use of broadband preprocessing coupled with high resolution steep dip reverse time migration (RTM) and Kirchhoff imaging algorithms will produce data ideal for prospect identification and exploration. ION President and Chief Executive Officer, Brian Hanson, commented, "We are pleased to be collaborating with WesternGeco on such a large project offshore Mexico, where we anticipate continued strong client interest. The Campeche 3D reimaging program area is in one of the most challenging, yet prospective regions offshore Mexico where we have significant processing experience and expertise."

The program is fully supported by industry funding. Fast-track data are available now for Round 1.4 deepwater bid preparation decisions.

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# OVERCOMING CHALLENGES AND FINDING NEW AFRICAN MARKETS

Stanford Tassie, managing director and CEO of Tilone Subsea, talks to *Oil Review Africa* about getting through the challenges posed by the low oil price environment, local content requirements in all markets, and meeting international standards.

## How did Tilone Subsea start?

In 1993, after my stint with Chevron as a young design/construction engineer, I was divinely inspired to start Tilone Nigeria Limited. It was incorporated in March 1993 to render engineering construction and procurement services. In 2001, the company realigned her scope of services to marine, contracting and subsea inspection, maintenance and repair (IMR) services. In 2010, the company was renamed Tilone Subsea Limited to reflect her core competences.

## What have been some highlights for the company?

Tilone has enjoyed a fair share of highpoints and some of these include the purchase of Seaye Falcon ROV in 2004 and training of personnel in the UK as ROV pilots and technicians; the successful mobilisation of an OIMR vessel with WROVs onboard for TOTAL in 2012 and then Exxon Mobil in 2014; the purchase of two Quantum XP WROVs from Hallin Marine, our former technical partners; and the certification to ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 for Quality, Environment and Safety Management Systems.

## What challenges does the low oil price climate create?

Demand for offshore drilling rigs

which we support with our ROVs came to almost zero and clients we supported with our equipment for the production end of the industry negotiated down contracts to the point that they were almost not profitable to run. Very few offshore rigs are currently operating in Nigeria and this has put a lot of constraint on offering lucrative pricing as the industry has become extremely competitive. Offshore exploration and drilling activities came to a halt and production activities were streamlined to reduce cost. There has been underutilisation of equipment. Most assets are not deployed and some were purchased with bank loans, so we are struggling to meet bank obligations with assets that are undeployed.

## How are these challenges being met?

The low oil price has impacted negatively on Tilone's operations and consequently various degrees of redundancy for both personnel and equipment, below optimal utilisation of resources and downscaling of operations. We, however, are employing cost saving strategies to reduce operating costs and re-current overheads/expenditure.

## What impact does the low oil price have on expansion?

The low oil price has led to

expansion plans being slowed down tremendously and some totally suspended but going forward Tilone will strategise with more careful steps.

## Where do you see as the growth areas for subsea expansion in Africa?

Traditional areas, primarily offshore West Africa including Nigeria, if we get our act together and pass the PIB and move beyond it, that is, having a firm frame work for the future of the oil and gas industry, and Angola and Ghana. Also, offshore East Africa, Mozambique and Tanzania are future growth areas.

## What technologies does Tilone use to stay competitive?

Tilone has a fleet of state of the art WROV systems (SMD Quantum XP Heavy Duty 200HP systems) which are engineered for heavy duty work.

## How important is local content when recruiting?

We focus on placing locals in all countries in responsible positions including offshore and base positions in all employee strata: junior, intermediate and senior management positions. It is part of Tilone's core values to do this as it makes personnel readily available to work in each country and helps grow competencies locally.



Image Credit: Tilone Subsea

Stanford Tassie is meeting challenges in the market with smart strategies.

“Expansion plans have slowed down but Tilone with strategise with more careful steps”

## What sets Tilone apart from its competitors?

Tilone is 100 per cent indigenous company With a staff of over 95 per cent locals, we can render world class services. Training of locals in the various services we render, such as survey, ROV, positioning, subsea construction and offshore management. The drive to push locals to the highest levels of management in the company because the future lies in raising local competencies to run and manage the company operations. ♦



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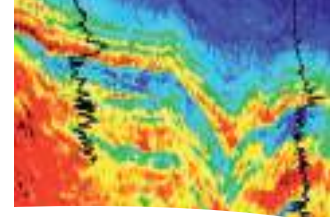
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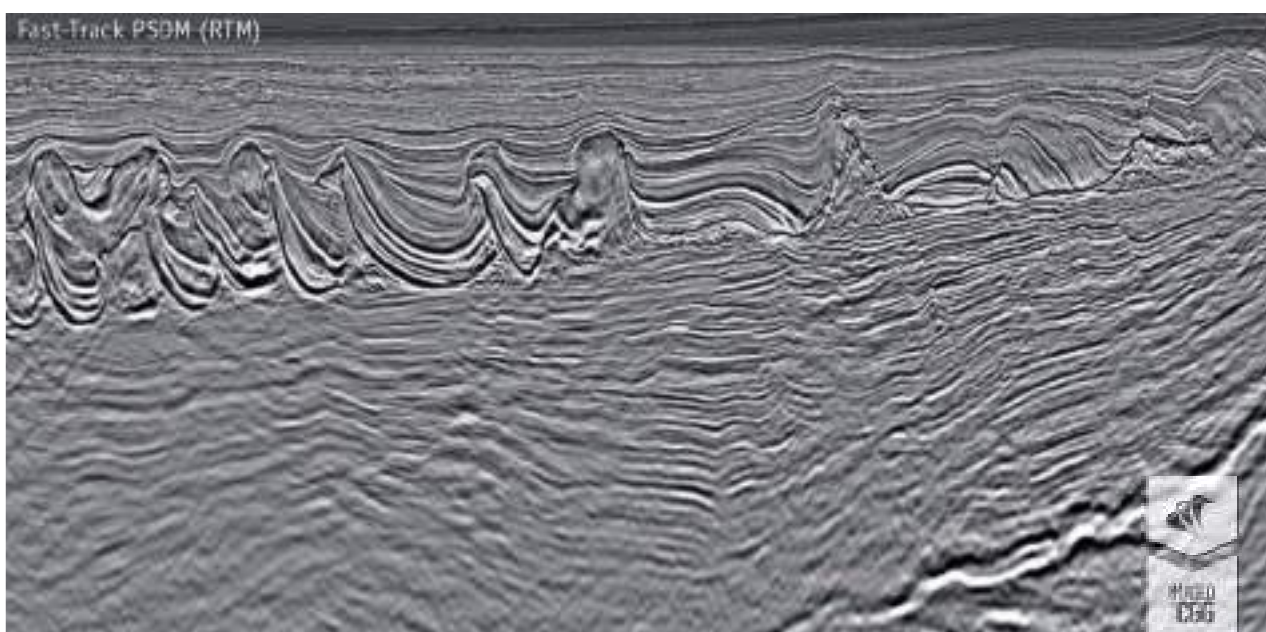
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# Gabon South Basin

## 25,000 km<sup>2</sup> of new **BroadSeis** data



CGG's fast-track 3D seismic data from our advanced **BroadSeis**<sup>™</sup> survey over the deepwater Gabon South Basin are available now. This survey is optimally designed for the region's complex salt structures and is imaged with the latest technology. The final PSDM data will be available in November.

CGG's **BroadSeis** data and advanced subsurface solutions offer unique opportunities for success in Gabon's emerging pre-salt story.



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