■ Training - p24 ■ Offshore - p26 ■ Technology - p30 ■ Events - p39

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Covering Oil, Gas and Hydrocarbon Processing

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Africa's investment hot spots

HE Yemi Osinbajo, Vice President of Nigeria, at the Cape VI Petroleum Congress in Abuja. *See page 21.*

Contents

Where are the best places for oil and gas investment in Africa? More on page 15.

Editor's note

THERE IS A strong investment theme running through this issue of *Oil Review Africa* and, as a result, there is a wide range of views and analysis on offer.

For our cover story on page 15, industry-leading consultants have compiled a detailed analysis of investment opportunities. It is essential reading for anyone seeking value-for-money investments in new markets.

Upstream sector investment is the focus of the interview with Dr Duncan Clarke, chairman of the board for Global Pacific & Partners. He offers a frank account of the challenges facing certain African markets in our new back page interview feature. Turn to page 46 to read his views on upstream investment in this challenging period for upstream players.

Meanwhile, on page 10, Dr Amy Jadesimi, managing director of LADOL, offers her upbeat perspective on the myriad opportunities for investment in Nigeria that have actually been facilitated by the fall in oil prices. According to Dr Jadesimi, now is a great time to acquire Nigerian assets.

We also have a special report on the Cape VI African Petroleum Congress, which was held in Abuja in March. Nigeria's gas ambitions dominated discussions. The full report is on page 21. A wide range of views were aired at the congress, demonstrating that there is always room for healthy debate when it comes to the future of oil and gas in Africa.

Tanzania is an emerging hydrocarbons market. (Image credit: Flickr/Florian Kreitmair)

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19-21	**MOC Mediterranean Offshore Conference & Exhibition**	ALEXANDRIA	www.moc-egypt.com
20-21	**Ghana Summit**	ACCRA	www.cwcghana.com
22-24	**Ghana Summit - Oil & Gas Frontier Markets**	ACCRA	www.thecwcgroup.com
27-28	**MMEC (Mozambique Mining, Energy, Oil & Gas)**	MAPUTO	www.mozmec.com
28-29	**Global Asset Integrity Management O&G Forum**	BERLIN	www.magvoyenergy.com
MAY			
2-5	**OTC 2016 (Offshore Technology Conference)**	HOUSTON	www.otcnet.org
2-3	**Global Asset Integrity Management O&G Forum**	FRANKFURT	www.magvoyenergy.com
4-6	Southern Africa Energy & Infrastructure Summit	MAPUTU	www.southern-africa-summit.com
9-10	**SPE Oilfield Corrosion Conference**	ABERDEEN	www.spe.org
11-12	**International Oil & Gas Security Conference & Exhibition**	LONDON	www.oilgassecurity.com
17-19	**International Conference on Petroleum Data Integration**	HOUSTON	www.pnecconferences.com
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10-12	**5th East Africa Oil & Gas Exhibition & Conference**	NAIROBI	www.expogr.com
13-16	**Nigeria Oil & Gas Exhibition & ConferencE (NOG 2016)**	ABUJA	www.cwcnog.com
14	**Adapting To A Challenging Oil Price Environment**	LONDON	www.spe.org
15-16	**IADC World Drilling 2016 Conference & Exhibition**	LISBON	www.iadc.org
21-22	**Cyber Security for Critical Assets**	RIO DE JANEIRO	www.criticalcybersecurity.com
28-29	**FLNG World Congress 2016**	SINGAPORE	www.iqpc.com.sg
30-2 June	**78th EAGE Conference & Exhibition 2016**	VIENNA	www.eage.org
JULY			
7-9	**2nd Oil & Gas Tanzania**	DAR-ES-SALAAM	www.expogr.com/tanzania/oilgas
12-14	**Tanzania International Forum for Investments**	DAR ES-SALAAM	www.tziforum.com
21-23	**World Congress on Petroleum & Refinery**	BRISBANE	www.petroleum.omicsgroup.com
25-27	**Artifical Lift Systems for Optimised Production Workshop**	BANGKOK	www.spe.org

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Regional players gather in Mozambique

A TOP-LEVEL SUMMIT will bring energy industry players and infrastructure leaders together in Mozambique. The Southern Africa Energy and Infrastructure Summit (SAEIS) will be held in Maputo, the capital of Mozambique, from 4-6 May.

This event, hosted by EnergyNet, follows the March announcement by Gigawatt Mozambique of a US$200 mn investment into the country's power sector, along with other global stakeholders, including Standard Bank and the World Bank. This major investment is aimed at leveraging Mozambique's natural gas resources, with the aim of benefiting many of its neighbours in the region, as well as Mozabique itself.

Many exciting infrastructure projects are taking place in Mozambique.

Regional co-operation, and the promotion of energy and infrastructure projects with a combination of public and private sector funding. Case studies of African energy and infrastructure success stories will also be shared at the summit.

"Regional development is the key to unlocking Africa's investment potential," said Veronica Bolton-Smth, EnergyNet's regional director for East and Southern Africa. "SAEIS will bring together countries from the SADC region to discuss live infrastructure and energy projects which require investment."

For more information: www.Southern-Africa-Summit.com

Nigeria pipeline boosted by digital tech

A NIGERIAN PIPELINE facility has benefited from the delivery of an Internet of Things (IoT) connectivity solution. The Shell Nigeria pipeline facility now has a digital oilfield solution (DOF) which was installed in a partnership with Ingenu and KONÇAR, at a cost saving of more than US$1 mn in infrastructure investment.

With the remote Niger Delta location of the pipeline, a streamlined and cost-effective solution for digitising the oilfield was an important consideration for the operator.

The DOF solution combines IT automation and instrumentation technologies to provide a support platform which serves the dual purposes of utilising remote field data and optimising operational efficiencies. The aim is for the integrated technology to provide fast analysis and efficient data management. This, in turn, offers Shell accurate insights into field processes, resulting in safe and efficient oilfield production.

The cost savings were achieved thanks to Ingenu's Random Phase Multiple Access (RPMA) network technology, which was mated with communications solutions including satellite and GPRS for a cost-effective, low-power, wide area RPMA network. This eliminated the need for expensive infrastructure investment, such as towers, radios, extensive data communications equipment and battery banks.

KONÇAR's role in the project was to provide Shell Nigeria with a collection of detailed field data in relation to pipeline pressure, temperature and flow. The KONÇAR remote terminal units and wireless pressure and temperature transmitters were installed in flow station, manifolds and wellheads. This provided connectivity from the field to the back office to ensure reliable information transmission.

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Forte Oil to raise funds for expansion

NIGERIAN OIL MARKETING company, Forte Oil, has announced plans to raise up to 100 bn naira (US$503 mn) in order to expand its business across the country. The proposal will go to a shareholder meeting on 26 April, when the company's annual general meeting will be held.

According to a statement released in March, Forte Oil is considering a range of options for raising the money. These include a rights issue, bond or share offering or global depository receipts.

"This capital raising is part of our preparations to take advantage of opportunities in the economy," Akinleye Olagbende, Forte Oil's chief compliance officer told Reuters.

In terms of where Forte Oil might seek to expand, Mr Olagbende said the company was interested in seeking out opportunities in the upsteam sector, and may look into other viable businesses for possible investment.

Forte Oil has reported a pre-tax profit of 7.02 bn naira for the 2015 financial year. This is up from the 6.01 bn naira pre-tax profit for 2014.

In another boost for Forte Oil, the company's group chief executive officer, Akin Akinfemiwa, has been elected as chairman of the Major Oil Marketers Association of Nigeria (MOMAN), the umbrella body of oil marketing companies for the country. Mr Akinfemiwa replaces founding chairman, Wale Tinubu in the MOMAN leadership role.

"Our main focus at MOMAN is to continue to work closely with all the regulatory bodies to finding lasting solutions to the problems faced in the downstream sector, and also to assist the federal government by ensuring uninterrupted supplies of petroleum products to Nigerians," said Mr Akinfemiwa. At the announcement of his new role, he described the oil marketing industry as "a driver of the Nigerian economy".

Unaoil leak may impact African operations

AFRICAN COMPANIES IN multiple countries may be implicated in a major oil industry bribery scandal that was revealed jointly by Australian newspaper publisher, Fairfax Media, and online news source, Huffington Post.

The story broke in early April with reports, sourced from files leaked to journalists, that Unaoil, a Monaco-based company, bribed government officials on behalf of its clients to help them secure lucrative contracts on oil industry projects. Unaoil's clients include exploration companies, comstruction companies, engineering firms, and oilfield service contractors.

The media reports have cited operators in numerous African countries as being involved in alleged bribery in regard to winning contracts.

In West Africa, allegations include Unaoil's involvement in relation to a gas project in Congo, as well as a contract in Equatorial Guinea in 2003, although this contract was withdrawn before it was due to be finalised.

Despite the size of its oil industry, Unaoil has not made any major deals in Nigeria. In Angola, another major African market, there have been allegations of bribery in relation to an equipment contract in 2011.

In North Africa, it has been alleged that Unaoil has been involved in Algerian and Tunisian refinery tenders.

Unaoil has denied the allegations and released a statement on 4 April. In the statement, the allegations are described as "grave".

"Many appalling things have been said about our business, allegations are being treated as fact, and speculation is rife," the statement said, adding that the company is "engaging with authorities" and "considering what actions we will take."

The US Department of Justice, anti-corruption police in Britain and Australia and authorities in Monaco are all investigating the allegations.

Oil-fired power plant opens in Senegal

THE 70 MW Tobene independent power plant has been inaugurated in Taiba Ndiaye, 90 km north-east of Dakar, the Senegalese capital. It is operating as a heavy fuel oil-fired plant and can be converted to a gas-fired plant, and is expected to provide electricity for up to 1.5 mn people, which comprises about 10 per cent of the Senegalese population.

Senelec, Melec PowerGen and the World Bank Group jointly announced the plant's inauguration.

The International Finance Corporation, a member of the World Bank Group, and Melec PowerGen developed the plant on a build, own and operate basis. IFC holds a 10 per cent stake and Melec PowerGen holds the remaining 90 per cent.

Melec PowerGen also operates the Kounoune power plant in Senegal and the Thika power plant in Kenya, both of which run on heavy fuel oil.

Oil-fired power plants are expanding in Senegal. (Image credit: Flickr/jbdodane)

Promising results from Cheptuket-1 well

THE CHEPTUKET-1 WELL, located in Block 12A, in northern Kenya, has encountered good oil shows, according to announcements from Africa Oil and Tullow Oil, two of the stakeholders at 20 per cent and 40 per cent respectively.

Delonex Energy, which launched an African E&P company in 2013, holds the remaining 40 per cent stake in the block. The Delonex stake in Block 12A is the result of a farm-down from Tullow Oil in 2015.

The promising showings were seen in cuttings and rotary sidewall cores across a large interval of 700 metres. Cheptuket-1 is the first well to be tested in the Keiro Valley Basin, and it was drilled by the PR Marriott Rig-46 to a final depth of 3,083 metres.

"This is the most significant well result to date in Kenya outside the South Lokichar basin," said Angus McCoss, the project's exploration director. "Encountering strong oil shows across such a large interval is very encouraging indeed.

"I am delighted by this wildcat well result and the team is already working on our follow-up exploration plans for the Kerio Valley Basin," McCoss added.

According to statements from Africa Oil and Tullow Oil, the objective of the well was to establish a working petroleum system and test a structural closure in the south-western part of the basin.

The promising results from the Cheptuket-1 project, as well as the success of the Etom-2 exploration in Block 13T, also in northern Kenya, indicate the presence of an active petroleum system with significant oil generation.

Post-well analysis is now in progress ahead of the stakeholders defining the future exploration programme in the basin. Now that the exploration process has been completed, the PR Marriott Rig-46 will be demobilised.

As well as the Cheptuket-1 and Etom-2 discoveries, the Kerio Valley Basin is also the site of the successful Ngamia and Amosing discoveries. The Ngamia discoveries were also drilled by the PR Marriott Rig-46.


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IMF executive board discusses Nigerian economy

UNDER ARTICLE IV of the IMF's Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. This year's report on Nigeria was recently discussed by the executive board of the IMF.

The directors welcomed the authorities' policy agenda of enhancing transparency, strengthening governance, improving security, and creating jobs. Directors noted that the Nigerian economy has been hit hard by the decline in oil prices, which has slowed growth sharply and led to macroeconomic imbalances. Given the uncertain global outlook, directors stressed the need for significant macroeconomic adjustment. They highlighted the importance of implementing a coherent package of policies, in consultation with IMF staff and development partners, to safeguard fiscal sustainability and reduce external imbalances, and advancing structural reforms to support inclusive growth.

Directors emphasised the critical need to raise non-oil revenues to ensure fiscal sustainability while maintaining infrastructure and social spending. They urged a gradual increase in the VAT rate, further improvements in revenue administration, and a broadening of the tax base. The stress was laid on the importance of strengthened public financial management and service delivery. They also encouraged the implementation of an independent price setting mechanism to address petroleum subsidies, while strengthening the social safety net.

Board members noted that the policy approach of expansionary monetary policy, together with a relatively fixed exchange rate and exchange restrictions, had adversely impacted economic activity. They underscored the need for credible adjustment to the large terms of trade shock, including through greater exchange rate flexibility and speedy unwinding of exchange restrictions to facilitate an exchange rate consistent with fundamentals.

The directors observed that further strengthening of the regulatory and supervisory frameworks would help improve resilience, even as financial sector soundness indicators remain favorable.

Structural reforms would enhance competitiveness and support investment. They encouraged the authorities to continue core infrastructure investment, and further reduce the cost of doing business through greater transparency and accountability.

IMF members welcomed renewed efforts to adopt legislation to spur investment in the oil and gas sector, and promote policies to strengthen governance of the sector, including targeted AML/CFT measures.

Directors welcomed the progress that has been made in improving the quality and availability of economic statistics.

They acknowledged the authorities' commitment to implement the eGDDS, including a National Summary Data Page, and encouraged efforts to improve balance of payments data and compilation of sub national fiscal accounts.

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Advance Notice

14th Africa INDEPENDENTS Forum

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Dr Amy Jadesimi is positive about the investment opportunities on offer in Nigeria and explains how the LADOL free zone is able to offer competitive prices to its clients. She spoke with *Oil Review Africa* editor, Georgia Lewis.

Cost savings and investment opportunities in Nigerian offshore

DR AMY JADESIMI, managing director of LADOL, spoke with Oil Review Africa about the services offered by the company's free zone facility in Nigeria, exciting future plans, and how the low oil price environment can offer excellent opportunities for investors around the world.

LADOL is a unique proposition in the Nigerian offshore market in that it offers a 100 per cent privately owned free zone for clients with access to a full range of drilling and support services.

"We are 100 per cent Nigerian-owned and the only facility that is 100 per cent privately financed," Dr Jadesimi told Oil Review Africa. "The investors know we are very dedicated to the market, we are in it for the long term.

"We understand the local market."

Major savings for drilling and production support

Dr Jadesimi says that the LADOL free zone facility is able to offer clients significant cost savings of up to 50 per cent, compared to other offshore support services on offer in Nigeria.

She describes the facility, with its Lagos location as a "convenient hub" for local and international operators.

"It is the optimal location with access to a harbour 24 hours a day, seven days a week," she said. "The location is key."

A particularly attractive feature for LADOL's clients is the fully integrated services on offer, with Dr Jadesimi explaining that because the free zone offers everything operators require, this keeps the costs competitive.

The services at the 30-hectare free zone include a US$150 mn logistics facility, a hotel, serviced offices, the quay wall, access to all necessary chemicals, fuel and water, and advanced information technology solutions.

Dr Jadesimi explained that LADOL has worked closely with the US Trade and Development Association to ensure the information technology solutions enable free zone clients to take advantage of cashless and paperless office applications.

The importance of customer satisfaction

Using local staff has also helped LADOL offer competitively priced support solutions.

"We have indigenous, fully trained staff and they are available 24 hours a day," said Dr Jadesimi. "Our main value proposition is that we are a low-cost provider and we offer a safe and efficient service."

Dr Amy Jadesimi, managing director of LADOL, is committed to providing great customer service to clients and moving forward with the expansion of the free zone.

As a private sector provider of services to offshore clients, Dr Jadesimi said that customer service is essential to the survival of the business: "We only get paid if our customers are happy."

A technical and local content success story

LADOL has been involved with a large Nigerian company in an offshore bloc installation project that Dr Jadesimi is particularly proud of.

"It is the first time an offshore oil bloc has been owned by a Nigerian company," she said, describing it as a "momentous project".

"There was a lot of work with the installation process before production," said Dr Jadesimi. "It was a huge win for local content and for meeting technical challengies."

Future plans for LADOL

With phase one completed, the LADOL facility has the capacity to load and offload two vessels or barges at a time, 24 hours a day, seven days a week. The initial quay wall covers a length of 200 metres with an 8.5-metre draft.

Phase two of the LADOL site is underway, and this will includfe a shipyard, an integrated FPSO and the doubling of the size of the quay. It is possible to expand the quay to a length of up to 1,000 metres. Phase two also includes a power plant which will have a capacity of up to 50 MW. The project becomes even more ambitious, with phase three incorporating railway and agricultural processing capacities.

Opportunities in the low oil price environment

While the drop in oil prices has been a source of much consternation across global oil markets, Dr Jadesimi is upbeat about the opportunities the price drop has created in the Nigerian market.

As well as LADOL's commitment to local content resulting in lower costs for its clients who are looking to economise in the current market, Dr Jadesimi told Oil Review Africa that now is a great time for investment in Nigeria, particularly in the upstream sector.

"It is the perfect time to invest in the market and pick up assets," said Dr Jadesimi. She also cited the new government's commitment to openness, transparency and maintaining the rule of law as another reason to invest in upstream projects in Nigeria.

"It is the optimal location with access to a harbour 24 hours a day, seven days a week."

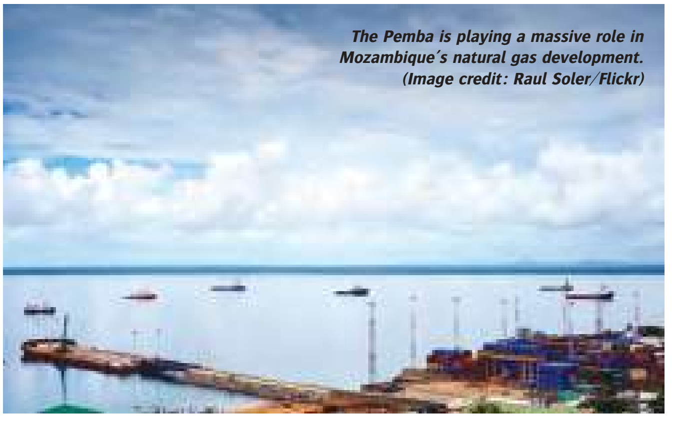
LADOL is keen to demonstrate its own commitment to being transparent and part of a robust regulatory environment. It has received a clean bill of health from the Nigeria Customs Service. The facility was visited by the service's comptroller-general, Colonel Hameed Ali, and he expressed satisfaction at LADOL's compliance with regulations during the high profile inspection of LADOL's vessels. He told reporters that LADOL is an investment that has all the trappings to stimulate growth in Nigeria.

Gbenga Kuye, managing director of the Nigeria Export Processing Zones Authority, has also praised LADOL for its commitment to growth and local content.

"We want to partner with legitimate organisations," said Dr Jadesimi, adding that there are opportunities for international investors in both private and public sector projects. ■

The Scotland-Mozambique Pemba initiative is an example of how to help lessen the impact of challenges in the oil and gas industry and create jobs for locals and expats alike, writes Johnathan Johnson, CEO of engineering recruitment company, Fircroft.

Mozambique's Pemba project: Setting a good example



The Pemba is playing a massive role in Mozambique's natural gas development. (Image credit: Raul Soler/Flickr)

Governments and organisations must look to form more creative partnerships if they're to resolve the crisis currently impacting the global oil and gas industry. In particular, there are solid opportunities for British companies to form mutually beneficial partnerships in Africa's emerging hydrocarbons market. More organisations and governing bodies need to follow the example of Aberdeen, Scotland, which has signed a creative partnership with the town of Pemba in Mozambique. Thanks to the agreement, Aberdeen-based firms can bid for new work and contracts in Pemba, an area which is said to hold huge reserves of offshore natural gas. The Aberdeen/Pemba partnership is just one example of innovation within the global oil and gas arena and should certainly be encouraged.

Opportunities for operators and employees in the North Sea and beyond

We all know that the North Sea and a number of other markets are down at the moment, but this won't be the case forever. The industry is cyclical and there are still numerous pockets around the world where there is significant demand for talent such as Kazakhstan, Azerbaijan and in a number of African countries, including Mozambique.

It is something that benefits the UK economy, as well as the global markets where partnerships are made. The UK has rafts of talented specialists and exporting their expertise is an option that governments and energy firms across Africa should be encouraging.

Good news for recruitment in Mozambique

Oil and gas firms have a great depth of expertise at their disposal and are not currently utilising it to its full extent. It recommends forming creative partnerships in the downtime regions like Pemba.

It is also important to consider the benefits that partnerships with education institutions can bring, particularly in light of the role that they play in nurturing the next generation of oil and gas operatives. The past few months have clearly been a difficult time for the North Sea but as a company that's been heavily involved in the sector for more than 45 years, it's our strong view that the market is cyclical and that it will only be a short time before business picks up once again.

The market has obviously struggled to react to the fact that the value of our product has essentially been cut in half but the UK government, as well as a number of major firms, have invested huge amounts into the North Sea and they're not going to allow these assets to go to waste."

Reports suggest that there will be an estimated 22 per cent reduction in the cost of operating existing assets by the end of 2016 and that, supported by the first annual production increase in over a decade, will improve the outlook for the region.

There are considerable opportunities out there. We've seen operators look to form strategic partnerships that make the use of UK talent in new, international markets. The strategic partnership between Aberdeen and Pemba in Mozambique is potentially a very fruitful collaboration that indicates that there is light at the end of the tunnel.

In 2012, Mozambique emerged as a new giant in the African natural gas sector, with more than 100 trillion cubic feet having been discovered, mainly in the offshore Rovuma Basin.

Mozambique's burgeoning oil and gas industry is beginning to open up a wealth of job opportunities for those engineers with the skills and experience who are seeking a new challenge. ■

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Overcoming negativity and improved governance are among the factors needed to make investment in African oil and gas a solid proposition. Max Gebhardt, Frank Ford and Dan Healy from FTI Consulting offer this analysis.

A bright future for African investment?

Oil tankers at Takoradi on the coast of Ghana. (Image credit: Ben Sutherland/Flickr)

ANY DISCUSSION OF why it makes sense to invest in African companies and, in particular in oil and gas projects, must begin by confronting all the negativity that historically has surrounded the continent.

Companies and investors in Africa have had well-founded concerns about political instability; endemic corruption; and regulations that have been loose, difficult to follow or constantly changing.

Potential investment or acquisition targets often have been notable for poor corporate governance and a lack of financial and operational transparency, as well as the regular recurrence of natural disasters such as floods and famines, as reasons for a persistent lack of economic progress in the region.

Yet today, there are encouraging signs. The peaceful political transition of power in Nigeria particularly is significant, given that the country has a growing economy and is increasingly perceived as the gateway to Africa, rivaling South Africa.

On the other hand, Africa continues to suffer hard luck. The 2014 Ebola virus outbreaks gave investors a new reason to shy away.

South Africa stands apart as a nation with a more developed economy, featuring bankers and corporations that weigh investments opportunities in the rest of the region in much the same way as their counterparts in other areas of the world.

Today, there are encouraging signs, such as the peaceful transition of power in Nigeria.

Because of slow growth in South Africa's own economy, investors and businesses there seeking expansion opportunities are looking elsewhere in Africa.

Those who see opportunity in sub-Saharan Africa point to its underserved population, an emerging middle (or, at least, consumer) class, and its rich pool of human and natural resources.

The region's economy is one of the world's fastest growing, with gross domestic product projected to rise an average 4 per cent to 6 per cent annually for the next several years.

The opportunity to profit from Africa's growth is real. On average, the continent's economies will grow 4.5 per cent in 2015 and 5 per cent in 2016, according to the 2015 African Economic Outlook report by the Organization for Economic Co-operation and Development (OECD), the African Development Bank (ADB) and the United Nations Development Programme (UNDP).

Given that, there should be opportunities in Africa and the oil and gas industry needs to capitalise on this.

But finding the right strategy will be tricky. What is required is not simply money — but executive leadership that sets an example for improved corporate governance that will lead to sustained success.

What does this mean for investment in African oil and gas?

Across the African continent, only a fraction of the large volumes of natural resources is being exploited. Access to energy is an essential part of Africa's push towards economic growth and development. Strong, fair extractive policies are essential.

As well as opportunities with existing oil and gas developments, more projects are coming online in countries such as Ghana, Tanzania and Uganda.

The good news is that multiple governments across Africa are implementing regulatory frameworks that favour investment in exploration, production and the necessary infrastructure development. Looking ahead, the African oil and gas sector is becoming more competitive.

New opportunities in Ghana, Tanzania and Uganda

Angola, Nigeria and South Africa have long been three of the major players in African hydrocarbon development but more players are emerging as forces to be reckoned with as the drive towards access to energy for all means responsible exploration and production of oil and gas is more important than ever.

Ghana remains a strong and growing oil and gas producer. By 2021, Ghana National Petroleum Company is expected hit its production target of 250,000 barrels per day. The Jubilee fields discovery has proven to be a success story for Ghana and further investment of US$20bn is being sought.

Additionally, the Tweneboa-Enyenra-Ntomme (TEN) field, a Tullow project, is looking very promising with estimated reserves of 245mn barrels.

The Rovuma field in Tanzania has been an important part of the country's gas sector development. This has contributed to tremendous interest in hydrocarbons with FDI increasing by 6 per cent to US$1.8bn in 2013.

Tanzania is now at a juncture where decisions will have to be made about how the country will use its gas for domestic customers and how LNG infrastructure can be put in place to create a strong export market, particularly to big-spending, energy-hungry Asian markets.

The country will need to raise the capital to meet the enormous potential of its gas resources and this will require broad investment in technology, development, export operations and infrastructure for gas-to-power transmission.

In the past decade, Ugandan oil and gas exploration has continued apace. Discoveries in the Albertine Graben basin and Lake Albert have made Uganda a global player and boosted its status as a country worthy of investment in hydrocarbon development. The Albertine Graben basin is 40 per cent explored and has a success rate of 90 per cent.

Muhammadu Buhairi, President of Nigeria, has promised reforms to improve governance and cut down on corruption, which impacts on the oil industry. (Image credit: European Parliament/Flickr)

Liberal fiscal policy has put Uganda in a strong position to attract foreign investment. The Ugandan government has implemented policy which states that oil and gas operators must support the development of the petrochemical sector based around an oil refinery.

This refinery's government-estimated cost will be US$2.5bn based on a capacity of 60,000 barrels per day. Potentially, this could be a great opportunity for direct foreign investment as long as the relevant technology and a robust financing structure are put in place.

Mixed news for oil and gas investment

Other factors will have an impact on Africa's attractiveness for oil and gas investment. The African Economic Outlook report predicted that

The Ugandan oil industry has been working for a long time to develop the entire value chain. This is a truck transporting petroleum for export in 2004. (Image credit: Stefan Gara/Flickr)

private foreign investment will grow to US$55.2bn in 2015, more than 10 per cent higher than 2014.

But the figure continues to be significantly lower than the US$66.4bn invested in 2008, a sign that foreign interest in investment in Africa, while rising, still has not fully recovered from the blow of the global financial crisis.

One of the greatest traditional concerns about Africa — its burgeoning population — also represents an opportunity. Sub-Saharan Africa's population is expected to double by 2050, and, unfortunately, many of those people will be born into poverty, according to the Population Reference Bureau.

On the other hand, the ADB reported in 2014 that a stable African middle class, defined by the ADB as people spending from US$4 to US$10 a day, already has grown to 313mn, or 34 per cent of the total population. A larger middle class means greater demand for improved infrastructure and this can be facilitated by access to energy.

The recent peaceful transfer of power in Nigeria for the first time in its history has given rise to optimism about the potential for political stability in the region.

In March 2015, former President Goodluck Jonathan conceded the national election to Muhammadu Buhari, who was inaugurated in May. If the leaders of other African countries see that a more democratic political climate leads to a better economy, they may be motivated to follow Nigeria's example.

The burgeoning population of Africa is a traditional concern, but it also represents an opportunity.

Nigeria's robust oil and gas industry plays a major role in this climate of growth. The Nigerian government received US$293bn in royalties from 42 oil and gas companies operating in the country between 2006 and 2012, it was disclosed in December 2015 by the Nigeria Extractive Industries Transparency Initiative.

Robert Diamond, Jr., the former Barclays CEO, now focusing on African investment as CEO of Atlas Merchant Capital, cited Nigeria's peaceful political transition as one of the major reasons for his own optimism.

Speaking as part of an FTI Consulting panel discussion at the World Economic Forum on Africa 2015 this past June, Diamond said, "Nigeria is a very big part of the [sub-Saharan Africa] growth story, [as] one in three of GNP [gross national products] comes from Nigeria and one in five Africans is Nigerian."

Throughout the region, urbanisation and population growth "will demand services [that don't exist today] and infrastructure that is still to be built," said Rick Menell, a senior advisor to Credit Suisse and a mining industry veteran, speaking at the same event.

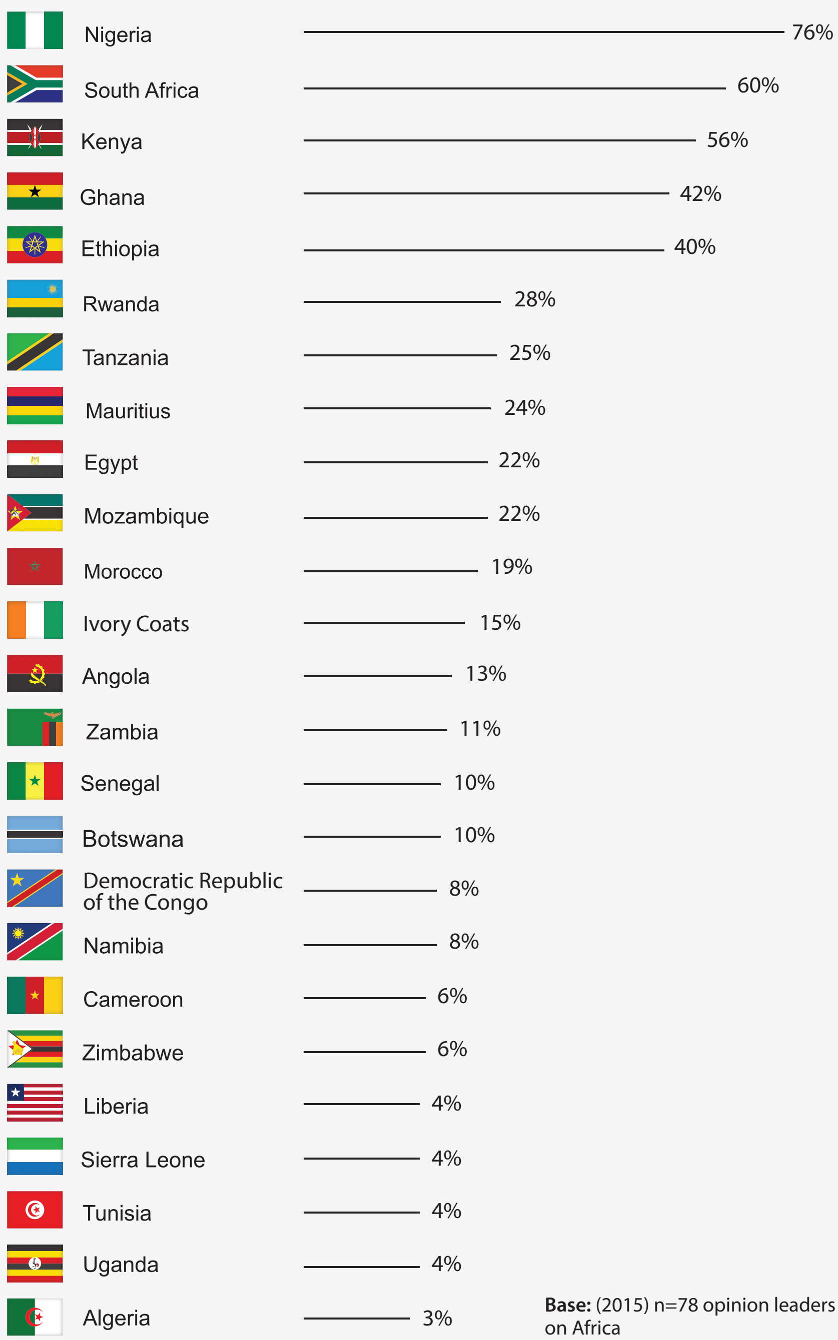
"Public-private partnerships are necessary, but they need a regulatory framework that satisfies both the profit motive of investors and the broader mandate of governments."

Businesses are looking for governments with whom they can work and sensible regulatory structures surrounding oil and gas development will certainly play an important role.

Dealing with African governments can be difficult, but the challenge is starting to look more manageable. Given a sufficient appetite for

Figure 3: Future Gateway for Business to Invest in Africa

Q. Which countries do you consider will become the gateways for business to invest in Africa in five years?



Base: (2015) n=78 opinion leaders on Africa risk and a properly diligent approach to risk mitigation, investors and companies interested in investments.

FTI surveyed a panel of business leaders and 89 per cent expect an overall rise in investment. The good news for the oil and gas industry is that the areas where investment is expected to rise all require reliable access to energy, with 96 per cent expecting the greatest increase to occur in communications infrastructure and 90 per cent expecting an increase in traditional infrastructure such as transport, schools and hospitals.

Additionally, investment is predicted to be solid for energy infrastructure itself. Additionally, 74 per cent said they would most like to see investment increased in agriculture, another energy-hungry sector.

An African investment strategy

Africa is poised to more fully realise its economic potential. Investing in African companies still calls for a great deal of caution. The opportunities in Africa are real, but the investors that profit most will be those that take the time to completely understand what they are buying or investing in.

By definition, capitalism is good for business. It's particularly good for business in Africa. Smart foreign investment improves the governance of African businesses, which, in turn, increases opportunities for other businesses, both within and outside the continent.

South Africa has one of the more developed economies in Africa. (Image credit: mallix/Flickr)

The message from investors is (and ought to be), "We're not going to give you money unless you behave like a real business."

Investors have the right to insist that the African businesses they put money into meet the same standards of management and governance they would expect from companies anywhere else in the world.

By setting high standards, investors cannot only capitalise on an improving economic climate in Africa — but they also can accelerate it.


Because He founded the earth upon the waters...
And four fifths of the earth is under water
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Engineering, Construction & Project Management of Oil & Gas Facilities.
Marine Vessels Services
Tilone
SUBSEA
TILONE SUBSEA LIMITED
Marine Contracting & I.M.R. Services
UKAS
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OHSAS 18001: 2007
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The Lagos Deep Off-Shore Logistics facility. (Image credit: LADOL)

Two questions appeared to hang over and direct the conversation at the Sixth African Petroleum Congress and Exhibition (CAPE VI), which was held in Abuja from 15-18 March.

Nigeria seeks collaborations to fund its gas vision

WITH THE NIGERIAN government's plan to reduce gas flaring through joint venture contracts that would expand infrastructure and deploy liquefied natural gas for domestic and industrial uses by 2020, what viable local infrastructure was in place to aid reduction of production cost for investors?

The second question was how the government intended to handle issues, with past collaborations, that cropped up as a result of poorly executed legislation and unreliable government policies, and encourage a stable environment for future investments.

Nigeria is a member of the World Bank Global Gas Flaring Reduction (GCFR) Partnership, and according to the Vice President, Professor Yemi Osibanjo, who opened the exhibition on behalf of President Muhammadu Buhari, it will, with the support of its Parliament, sign the United Nations agreement of "Zero Routine Flaring by 2030". It has, however, targeted 2020, ten years ahead of the UN's target. Its call for collaboration is aimed at achieving this ambitious goal.

However, the problem some see with investing in Nigeria is the penchant of each succeeding administration to make grand plans but put forward little by way of strategy to ensure that these plans and visions are executed even when the administration is no longer in power.

Olivier Mussat, chief investment officer Oil & Gas of the World Bank Group's International Finance Corporation (IFC) addressed this point, during a question and answer session on Day Two after his presentation titled Africa Oil & Gas: Challenging Road Still Ahead.

He spoke about how a change of administration often affected government-investor relationship. Most governments, he said, were usually wary of being taken advantage of by private investors and in a situation where a private investor takes advantage of a weak government, the tendency is for the new administration to rescind the investor's licence.

"You are doing it for the right reason but the signal you are sending to the world is that you are not a stable country to operate in," he said, however.

What was more important, he noted, more so even than infrastructure, was to have a "country view" – where an administration looks beyond the four years it gets to stay in power and rather creates strategic structures including legislation and infrastructure that would ensure development for years to come.

He gave an example of his country, France, where the government in the seventies decided that rather than being held hostage to oil and gas drops, natural resources it did not produce, it would develop instead a nuclear programme.

"This came from the strategic vision of a president who knew that this nuclear programme would happen after he was gone; so you need vision," Mussat advised.

Chidi Momah of the Nigerian National Petroleum Corporation (NNPC), the agency that regulates Nigeria's petroleum industry, in his talk – Revisiting the Regulatory Space for the Nigerian Petroleum Sector – on Day 1 of the exhibition, had discussed the government's plan to create a transparent regulatory environment through new legislation.

This news is supposed to sound encouraging to old and new investors – finally, an end to the bureaucratic bottlenecks and inefficiency that have characterised government-private investor collaboration in Nigeria's petroleum industry, a situation which has often led to a call for complete privatisation of that sector – except that we have been here before.

In the same presentation, Momah denounced the Petroleum Industry Bill – a legislation that was touted back in 2007 when it was introduced, as the herald for the much-needed reforms in the oil and gas sector, and was designed to strengthen the capacity of indigenous Nigerian companies in the oil and gas sector to compete with international oil companies in the search and acquisition of hydrocarbons in Nigeria.

Nigeria is a member of the World Bank Global Gas Flaring Reduction (GCFR) Partnership, and according to the Vice President, Professor Yemi Osibanjo, who opened the exhibition on behalf of President Muhammadu Buhari, it will, with the support of its Parliament, sign the United Nations agreement of "Zero Routine Flaring by 2030"

CAPE VI welcomed petroleum specialists from across the globe and government officials in Africa's petroleum sector.

Momah said, however, that the bill's expectations did not match the realities on ground. Hence, the need of new legislation derived from the old one. This time it would cover three or four bills that would clarify roles, create viable institutions with clear functions and boundaries, and "avoid making investors dance around" – a much needed situation for long-term stable, productive collaborations that will survive administration after administration.

Still, despite the inefficiency and inconsistency, Nigeria has in the last few years managed some collaborations that have endured changes in administration; such as General Electric service centre for manufacturing rotating equipment in Calabar, the LADOL industrial free zone in Lagos, Dangote indigenous refinery in Lagos and the Samsung FPSO Integration Yard in Lagos. These were highlighted by the vice president, Osibanjo, while he called for partnership from member countries in the African Petroleum Producers Association (APPA), the organisers of CAPE VI.

However, there is still the clamour for on-ground viable infrastructure that would reduce production costs and create opportunities in other sectors of the economy apart from oil and gas.

Uzo Nwagwu, GE's COO of Oil and Gas (Sub Saharan Africa), who made this call, noted that there were some infrastructure currently in place such as the East-West Road and the West African Gas Pipeline; but they were largely still under construction (East-West Road) or underutilised (West African Gas Pipeline, a project which began in 1982, was completed in 2006 but since then has faced numerous delays in operations due to one problem or the other.

"Until we actually take a very close look at the various (infrastructure) that currently exist and address (viability) from a tactical standpoint, it becomes extremely difficult to create a logistical hub that will not just serve the country but the (West African) region," Nwagwu said.

> "Nigeria's first 100 per cent privately financed high value free trade zone equipped with technologically advanced infrastructure that can support high value industrial projects and reduce cost of operating in Nigeria by 50 per cent."

And this is where we get some real breath of fresh air. Amy Jadesimi, the managing director of Ladol, a company the vice-president identified as "wholly indigenous, privately developed and hosting the largest shipyard in West Africa", stepped up to the stage and delightfully declared that her company could solve all of GE's problems.

However, in her presentation titled 'Private Development Imperative: Driving Economic Growth through Local Private Sector in Nigeria', Jadesimi stressed the need for local content, calling for investments from "the indigenous people of Nigeria", which, she said, would result in strategic infrastructure that would cause a multiplier effect in the development of growth markets

Emphasising the importance of local content, she noted that the contributions foreign currency revenue, which comes from oil and gas, to Nigeria's GDP on a rising scale was negligible. On the other hand, there were huge benefits to be derived from "real local content".

"Real local content lowers cost," she said, noting her frustration when she hears statements to the contrary.

Giving Ladol as an example, she said it was "Nigeria's first 100 per cent privately financed high value free trade zone equipped with technologically advanced infrastructure that can support high value industrial projects and reduce cost of operating in Nigeria by 50 per cent." It has been in operation for close to 10 years.

She also spoke of a vision to create more wholly indigenous companies like Ladol, all around Nigeria so that much of the profits from the oil investments remained in the country.

Which brings us back to the Petroleum Industry Bill, which was decried by the NNPC as untenable, and a third question, is there a (sizable) piece for the Nigerian investor in the pie is government is currently offering to the world? ■

Nigeria advises African countries to unite to push gas development

NIGERIA'S VICE PRESIDENT Yemi Osinbajo has urged African countries to work together to address the development of a robust gas infrastructure in order to meet its future energy needs.

He made the remarks at the 6th edition of African Petroleum and welcomed leading government, institutional and private sector petroleum stakeholders taking both long-term and short-term positions on the continents oil and gas sector.

The event takes place every three years and is Africa's most strategic oil and gas meeting, attracting petroleum experts from across the globe and Africa's top government officials in the petroleum sector, reported state house correspondent Mariah Oasehinde.

CAPE VI will allow visitors to find out about the latest prospects for mergers and acquisitions, exploring ways they can expand their network throughout the continent, plan their pan-African petroleum strategy and demonstrate new technology innovations and services at the CAPE VI exhibition to a pre-qualified audience of potential buyers.

Nigeria's Vice President Yemi Osinbajo

In December 2015 at the CAPE VI launch press conference, the minister of state for petroleum, Dr Ibe Kachikwu, noted the importance of African petroleum producers working together to develop resources and share their knowledge on the oil and gas sector to lower production costs. He also added that CAPE VI was a good meeting place for specialists in the sector to come and discuss this.

"Nigeria was a key founding member of APPA and a promoter of the African Petroleum Congress. We hope that the event will highlight the nation's oil and gas potential to a global audience and help showcase Nigeria's small and medium scale oil and gas companies to other African countries and world at large," said Dr Kachikwu.

CAPE VI was inaugurated by his Excellency the President of the Federal Republic of Nigeria and welcomed the eighteen member states of APPA (Algeria, Angola, Benin, Cameroon, Chad, Congo, Côte d'Ivoire, DR Congo, Egypt, Equatorial Guinea, Gabon, Ghana, Libya, Mauritania, Niger, Nigeria, South Africa, and Sudan), including their Ministers and National Oil Companies.

Exploration and service companies active in Africa were also welcomed to the event, alongside Africa's indigenous companies.

HE Muhammadu Buhari GCFR, President and Commander in Chief of the Armed Forces, HE Mahaman Laouan Gaya, Executive Secretary, African Petroleum Producers Association (APPA) and Dr Amy Jadesimi, managing director, LADOL Integrated Logistics were also present at the show.

Investing in high quality training, rather than simply opting for the cheapest provider, is a worthwhile activity for any oil and gas operator in Africa. Andy Gibbins, director of GLAS Consulting, outlines how effective training will help build the talent pool for the future.

Effective skills development: More important than ever

THE OIL, GAS and petrochemicals industry finds itself in highly turbulent times in the early months of 2016. The collapse in the crude oil price, global stock market uncertainty and the slowdown in Chinese growth have combined to give us some of the toughest times that we've faced, certainly in recent years.

These factors have hugely impacted profitability for companies in the sector and inevitably, budgets have been cut, particularly in those areas of discretionary expenditure such as travel, conferences and skills development.

The challenges ahead

Furthermore, the volatility and uncertainty in oil and gas markets have resulted in some young people losing interest in the oil and gas sector as a career option and instead choosing more 'fashionable' industries instead. For example, the number of university students taking petroleum engineering courses has declined in recent years.

The challenge facing the industry right now is to avoid a repeat of the 1980s and 90s, when, like now, plummeting oil prices led to thousands of job losses and fewer young people obtaining industry-relevant qualifications.

As demand returned, the industry never caught up and the impact is still being felt. There is a lack of suitably qualified candidates in the 30- to 45-year-old age range, from which most senior management and executive leaders are drawn. The experienced employees, in their 50s and 60s, are starting to retire, but there are not enough skilled and seasoned individuals moving in to replace them.

This demographic time bomb is a major concern, but at the same time, we are cutting expenditure when arguably, it needs to increase.

There is a demographic time bomb in the oil and gas workforce and skills development is more important than ever.

Developing local content

Arguably, skills development in Africa is now perhaps more important than ever. There are ambitious localisation programmes across the continent, and all with challenging quotas to meet in terms of staff percentages coming from the home country. This is absolutely the right thing to do. As the industry matures, it needs to move away from such a strong reliance on expatriate labour and achieve a sustainable and cost-effective approach, with a steady supply of highly skilled local talent. Of course, this isn't easy, especially at the outset, with all industries actively chasing the best graduates and skilled, motivated people.

The issue isn't just one of sustainability. Repeated surveys have shown that the average local salary in Africa is two to three times less than the average expatriate salary. This is, in part, due to local employees occupying fewer technical and senior positions, but is also due to the fact that expatriates expect higher salaries to work away from home, particularly in those regions where the level of security risk is higher.

With this move away from reliance on expatriate labour to a much greater emphasis on local labour, real skills development is essential. It is no longer enough to just buy training courses from a catalogue, based on title.

Instead, it is essential to have competency-driven programmes, with measurable outcomes and using carefully selected and high quality training providers. The focus on outcomes and quality will be the secrets to success.

Striving for excellence in training

There also has to be more involvement of functional leaders in the training and development process. It isn't enough to simply send someone on a training course and expect them to be immediately different and more effective in the workplace. Instead there has to be a focus on the newly acquired skills and how to use these in the workplace. This needs pre- and post-course discussions with the line-manager, together with the setting of some clear and measurable objectives related to the training, which will allow the new skills to be put to active use and the impacts actively measured.

Gas development in places such as Cameroon requires investment in the very best quality training, and it may not necessarily be the cheapest available. (Image credit: Carsten ten Brink/Flickr)

The impact of the training course should be reviewed with the employee several months after the event (typically six) to ensure that the outcomes have been achieved.

As the oil and gas industry has grown in Africa, so has the training industry, with a proliferation of training providers, some of which are very good indeed and some of which are, frankly, poor. Buyers of traning services need to have much more focus on exactly what it is they are buying and hone in on the credentials and experience of those actually providing the training. Good training means having good content, but this alone is not enough. If it cannot be delivered in an engaging and interesting way, the impact will be lost.

Positive change in the pipeline

I'm pleased to say that I see clear signs that the above messages are being taken on board in the region. I recently worked with a petrochemicals major delivering a bespoke programme for shift team leaders. We had considerable discussion on the specific requirements prior to the events, including meetings at site with functional leadership and other major stakeholders, such as the human resources department. Of course such an approach takes more time and effort (and in truth costs a little bit more too), but the impact is far better than it otherwise might have been. The company sent senior managers to open the training sessions and explain exactly why they were being conducted. They also attended at the end of the event to listen to the presentations and action plans of the training delegates and to outline the related next steps.

In summary, there are a number of important points. Firstly, training and development absolutely must not stop, despite the current financial challenges.

The training approaches that cost a little bit more often have far greater impact, despite current financial challenges.

Secondly there has to be a greater focus on incorporating the training process much more into the overall development plans of staff, with much more involvement of the line managers and very close collaboration between line managers and the training department.

The next generation of employees in the African oil and gas industry. (Image credit: Union to Union/Flickr)

Thirdly, we must look very closely at workforce demographics before it is too late.

Finally, localisation programmes must remain a priority. These are the key to the future sustainable success of companies in the region.

Care should be taken to make sure that these training programmes are excellent – this is far more important than focusing on the cost of such programmes. ■

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John MacKay, from global surveillance solutions business Synectics, provides an overview of current offshore surveillance technology trends.

Using integrated surveillance systems can result in operational and cost efficiencies for offshore operators. (Image credit: iurii/Shutterstock)

Harnessing technology in a cost-critical climate

THE GLOBAL OIL and gas industry has entered a turbulent era of oversupply, with unstable pricing and restricted budgets posing a long term challenge, not just a short term hurdle.

Operators need to 'ride the storm' by boosting operational efficiency. It is an objective prompting many to innovate by adopting technologies that aid production while minimising demand on resources.

Investment in digitisation and analytics from an E&P perspective may grab most of the headlines in this respect. Offshore operators should not underestimate the potential operational efficiencies – and therefore cost efficiencies – attainable by using the right surveillance solutions, in the right way.

Integrated systems

The emergence of IP-based surveillance presents the most significant opportunity for the sector in this regard, as it enables seamless integration between video and a wide range of critical third party systems such as access control, process control, chemical detection, emergency response and even radar.

The immediate benefit of this is that it takes fewer people less time to monitor systems when they are unified – and therefore manageable – in a single command and control environment. But the more significant benefit for a cost-conscious market is the depth of data analysis this level of integration facilitates.

Details such as fluctuations in temperature, noise or equipment performance, access anomalies and unusual personnel movements, can be easily monitored and continually cross-referenced via a single security management system to identify issues before they have a chance to escalate. The same system can also be configured to prompt high definition visual feed (from the nearest camera stations) and generate automatic on-screen incident investigation / response workflows for even greater efficiency.

Consolidating site monitoring in this way enables swifter threat response and ultimately can prevent incident escalations that would be dangerous to people, places and profits.

> It takes fewer people less time to monitor systems when they are unified in a single command and control environment.

Maximising existing assets

Of course, while the dominant surveillance trend for new developments is for HD IP-based systems, there are still a huge number of analogue cameras in operation.

The scale of some sites, combined with budget restrictions, means wide scale replacement of analogue cameras is simply not feasible, and given that many operators will be looking to develop their existing assets ahead of new project investment, ensuring that all 'old and new' can work together is essential.

This is particularly relevant in areas where project expansion, due to a long history of development, is more common.

One of the major benefits of the latest interoperable surveillance systems, in terms of pure cost effectiveness and ease of use, is that they can utilise legacy products i.e. existing analogue cameras and their infrastructure, connect them with new technology, and unite them in a system that delivers all the advantages of digital control functionality – a hybrid system.

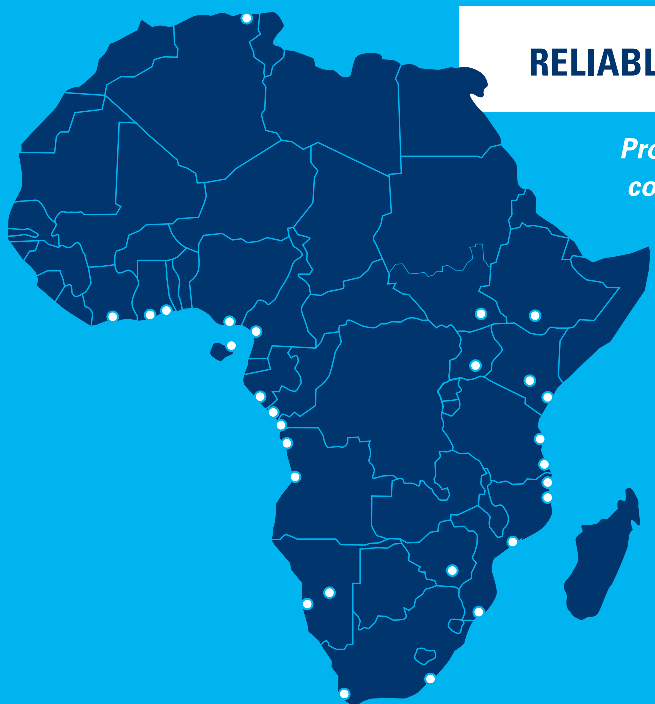
This can make a big difference to the overall investment figure for upgrading a project (for example introducing new drilling platforms or improved logistics infrastructure) as it negates the need to strip out and start from scratch. With a fully interoperable system, these new camera stations can be quickly and easily introduced, and work side-by-side with existing cameras, feeding into one digital monitoring and control system.

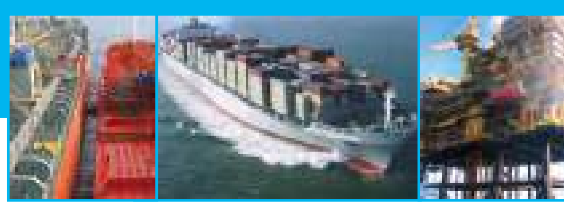
Safer assets are more cost-effective

Using surveillance to detect corrosion and degradation may not be the first thing that springs to mind when discussing technology as a cost-reduction measure, but the reality is that safer assets are more efficient and therefore more cost-effective.

Offshore assets are susceptible to extreme weather conditions and factors such as salt corrosion. This can leave equipment open to levels of wear and tear that can quickly escalate from minor degradation to complete malfunction. Constant manual inspection is expensive, and in many instances dangerous, for the personnel concerned. Today's surveillance solutions offer a viable alternative.

Real-time, high resolution, high efficiency





Surveillance can be used to detect and monitor threats to asset integrity. (Image credit: canaryluc/Fotolia)

transmission of visual data, using low bandwidths to avoid resource drain and unnecessary spend, is possible using cameras that can operate in confined space, low light and at extreme low and high temperatures. They are ideally suited for monitoring non-hazardous rig areas and are perfectly tailored for continuous monitoring of hazardous areas, often difficult or dangerous to inspect manually on such a regular basis.

By integrating video feed with analytics via a command and control platform, any deviation from set parameters (or combination of possible degradation indicators) can be programmed to trigger an incident alert on monitors in the control room for personnel to investigate further. And, thanks to improving IP networking and connectivity, monitoring of this nature can be conducted from an onshore base, supporting leaner operations for offshore assets.

Equipment degradation monitoring, however, is not the only way that surveillance can be used to improve safety and cost-efficiency. For example, through combining data sets from multiple systems, the time required to detect and respond to suspected leakage can be greatly reduced.

Thermal camera stations are able to detect spillage by demonstrating variations in temperature and thermal emissivity between the oil and the water. Generally, due to the thermal conductivity of oil, it will become warmer than the surrounding water in the day by absorbing heat more quickly. Integrating thermal video with other process monitoring systems ensures that any signs of spillage trigger alerts and guidance for operators to check process equipment nearest the potential leak.

This enables rapid incident reaction in order to limit any negative fall-out from a safety and an environmental perspective, but also ensures financial losses are minimised in terms of product loss and regulatory fines.

The same principle applies to areas such as flare, tank and pipeline monitoring. Early detection of poor flame colour or equipment 'hot spots' enables the deployment of maintenance personnel before process inefficiencies become full scale issues. This is a valuable capability for a sector focussed on keeping a lean bottom line.

> While operators of offshore assets may not be able to prevent physical incursions, they can use integrated security management solutions to detect and deal with threats earlier.

Surveillance and piracy

Piracy continues to be a global problem for the offshore oil industry.

While operators of offshore assets – fixed or floating – may not be able to prevent physical incursions, they can use integrated security management solutions to detect and deal with threats earlier.

Radar, cameras (fixed, PTZ, thermal and multi-spectral), Automatic Identification Systems (AIS) and Electronic Chart Display and Information Systems (ECDIS) are increasingly being integrated using open platform command and control solutions. This facilitates the creation of virtual perimeters that trigger immediate vessel-type identification and positioning if breached, and the production of automatically generated incident response workflows, including instruction for SOS notifications or evacuation procedures.

In the event of intruders boarding the asset, it is also now possible for crew taking refuge in a citadel (designated safe zone) to transmit surveillance footage or communicate via VSAT to 'friendly forces' e.g. police, coastguard etc., providing real-time updates of the situation as it unfolds.

Surveillance technology is already being used by the offshore industry in this way to protect assets vital to the global oil and gas infrastructure. It's a trend which is undoubtedly set to continue.

Summary

The impact of global pricing instability is still keenly felt. Investing in solutions that support efficient, effective operations is an increasingly attractive proposition.

Integrated surveillance solutions appeal for this very reason. They enable operators to 'do more with less' by unifying sophisticated safety, security and process management systems to facilitate unprecedented levels of situational awareness – awareness capable of bridging the offshore/onshore divide.

Boosting detection, prevention and protection capabilities in this way, while also reducing demand on resources, ultimately means that operators can confidently protect their investment and prepare for the future. ■

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- Computation of fluid reserves volumes;
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Radars have revolutionised measurement for the hydrocarbons industry. Magnetrol's guide wave and non-contact radars are excellent examples of this new generation of leading-edge technology.

Guided wave radar and non-contact radar: A formidable team

RADAR TECHNOLOGY HAS revolutionised level measurement in a variety of process industries since the introduction of 4-20mA loop powered, radar-based transmitters in the 1990s.

Both guided wave radar (GWR) and non-contact radar have numerous advantages over older, more established level measurement technologies.

The benefits of radar technology

The benefits of using these radar technologies versus traditional level instrumentation are myriad. It is important to understand how guided wave radar and non-contact radar can work together to provide reliable level measurement.

Both GWR and non-contact radar have the same general principle of operation – that is, microwave time of flight and no moving parts. Because of these two important features, users can retrofit these radar transmitters into various process applications.

The Eclipse Model 706 guided wave radar.

Once installed, improvements in efficiency and accuracy can be quickly appreciated.

The various applications that use these technologies include: DPs, due to SG shifts, installation costs, and leak points; buoyancy, due to SG shifts, moving parts, calibration issues, and costs; RF capacitance, due to cumbersome calibration, dielectric shifts, and coating issues; and ultrasonics, due to vapour effects, turbulence and foam.

The Pulsar Model R96 non-contact radar transmitter.

How GWR and non-contact radar technology works

With GWR technology, the waveguide becomes a probe which is immersed in either liquid or a dry, bulk media. The impedance of the probe is reduced when the higher dielectric priocess medium being measured displaces the air. The electromagnetic pulses which are transmitted down the waveguide are reflected at this point of discontinuity and the reflections are measured by high-speed circuitry in the transmitter and thus the level is established.

In regard to non-contact radar, instead of the electromagnetic pulses bieng transmitted down a waveguide, as is the case with GWR technology, the energy is transmitted directly into the vessel through the air using an antenna. However, it does share a similarity with GWR in that reflections from the surface are measured by high-speed circuitry in the transmitter in order to establish the level.

A powerful combination for modern operators

Guided wave radar and non-contact radar are related technologies, and together they are a powerful combination that can cover the majority of your continuous level control needs.

A very similar user interface and quick disconnect electronics means that, if an operator knows how to use one, they will then know how to use the other.

Magnetrol delivers a powerful one-two punch in leading-edge radar technology with its formidable duo made up of the Eclipse Model 706 GWR and Pulsar Model R96 non-contact radar transmitters.

These best-in-class level control solutions provide advanced measurement performance compared to traditional technologies – and competitive radar products. ■

Operators need to ensure well testing is regular and measurements are accurate as this will impact on profitability and viability. Neil Bowman, team leader for CFD and flow modelling at NEL, outlines the latest techniques and research findings.

Best practice techniques for optimising every well

O*IL AND GAS* operators strive to optimise production of each well and reduce waste and inefficiency to maximise economic recovery. One difficulty with hydrocarbon production is that it is rarely possible to produce just oil or gas alone from a well. The production stream is frequently a mixture of hydrocarbons and a range of undesired contaminants like produced water and sand. Hydrocarbon-based solids provide challenges for flow assurance. Furthermore, process conditions can vary enormously from well to well, even in an individual well.

This poses an engineering challenge as the production system must be able to adapt to shifts in operating conditions. This affects the profitability and viability of the well. The ability to characterise and monitor the flow rates of constituent components with a production stream is vital to maximising economic recovery (MER).

An offshore oil platform off the coast of Santa Barbara in California. (Image source: Ken Lund/Flickr)

Well testing

A typical well test consists of two pieces of equipment. The first is a series of gauges, check valves, flow switching valves, isolation valves and packer assemblies located subsea, often as part of a dedicated string that can extract a range of data about the health of the well and operating conditions. The second component is the test separators and metering skids.

Owing to the advantages of single-phase metering over multiphase metering technology, current well test procedures are designed around test separators which allow the production fluid to be periodically sampled. By separating a sample into its constituent components and measuring them using single phase flow meters it is possible to gain insight into the behaviour of the production stream.

Well testing is conducted during the exploration phase to predict the life and production rates from a well. However, well tests are also used throughout the life of the well to monitor and track production rates. The data is used to profile the well using characteristics such as its flow capacity, skin factor, and the structural and/or hydrodynamic boundaries, which dictate the commercial viability of the well and the design/configuration of the production system.

Well testing to characterise the production profile allows the production process to be optimised, and maximise economic recovery. This characterisation relies on accurate measurement. However, even when using test separators and single phase flow meters there are a number of sources of error which can reduce the accuracy of a test. These include: large or sudden changes in the composition of the production fluid; presence of second phases; poor maintenance; poor calibration; fouling; installation effects; and well test frequency or duration

Measurement accuracy

A team from Coventry University set out to answer what effect accurate measurement has on MER. The team created an example reservoir case where typical values for reservoir parameters were chosen. Tests examined how different measurement data influenced the reservoir characterisation when compared with flow rates. The output was then used to select a reservoir fracture model which would be used to predict reservoir recovery factor. They found that the flow measurement error was only weakly linked to recovery factor. But the secondary effect of using data to select which model to use was significant. A flow measurement error of ±10 per cent was enough to mis-select the predicted reservoir model, resulting in a shift in recovery factor by around 12 per cent over 20 years. Incorrect flow rate measurement data was extremely important.

In the case study reservoir, the in-place hydrocarbon volume contained almost 40mn barrels of oil. At US$60 per barrel this would result in an error of around US$105mn. To put this in context, Nigeria alone has a reserve of more than 37bn barrels of oil. This results in a decrease of around US$103bn in total production.

The sample reservoir also highlighted the need for continuous measurement. When a test separator is used, it is typically only for a few days a month before another well is tested in the campaign. The recorded data is assumed to be correct for the month before the next test, where a new set of data is produced. During the assumed constant period, changes in the component flows go unmonitored and issues such as water breakthrough are undentified.

The major advantage of using multiphase flow meters for well testing is that it is possible to monitor the production stream in real-time, providing continuous data to operators which would be impractical with conventional testing techniques. They can greatly reduce the cost, complexity and size of the infrastructure required to conduct well tests. Multiphase flow meters do not generally constitute a well test system on their own, but more commonly operate as part of a wider well-testing strategy.

Accurate characterisation of reservoirs and production streams is vital to optimise production processes and maximise economic recovery. Through research and operational experience it has been found that the financial exposure caused by inaccurate flow measurement can be significant. Effective well testing procedures are vital in optimising production and maximising economic recovery.

Flow measurement technologies such as multiphase flow meters are developing rapidly with the capacity to provide increased accuracy, new insight and diagnostic capabilities. Most importantly however, they provide a continuous method of measurement allowing for a fast response for production optimisation and reducing inefficiencies.

Drilling time and costs can be reduced with the latest techniques, according to Angelo Calderoni, vice president, R&D, for Drillmec.

Continuous circulation techniques for best drilling results

DESPITE THE LOW oil price environment, the world will continue to demand more and more energy in the coming years, and hydrocarbons, mainly gas, will continue to play an important role in the energy supply for a long time.

The oil price drop has pushed operators to cut costs and activities planned in the coming years. New challenging E&P projects, such as deep and ultra-deep water and HP/HT wells, have been postponed because of the low oil price trend. However, in this challenging environment the industry will still have to drill new wells to supply the energy needed for the future.

In situations with a narrow drilling margin between pore-pressure fracture gradient, it is not unusual that a well is abandoned before reaching the target. This means it ends up failing technical and commercial objectives.

In fact, operators can spend an enormous amount of time and money trying to solve problems due to bottom hole pressure management, such as kicks and circulation losses, stuck pipes and low ROPs. Quite often, operators come to the erroneous conclusion that the well's technical limit has been reached, and believe that abandoning the well is the best decision. But better techniques could change this.

Operators globally can benefit from modernised techniques. (Image source: Jerry and Pat Donaho/Flickr)

Technical advances

In the last decade, technologies such as MPD systems and continuous circulation systems have been developed to manage the bottom hole pressure and its related problems. I have used both systems, but my view is that interruption of mud circulation for a connection is one of the main causes of typical drilling problems.

The mud acts as the first safety barrier in the well. When the mud pumps are not running because of the addition of components to the drilling string, most frequent drilling accidents happen due to bottom fluctuations in equivalent circulating density (ECD) and downhole pressure spikes, such as connection kicks and stuck pipes can happen. In conventional drilling this stop-start cycle of mud circulation occurs every 30, 60, 90 or 120 ft of hole being drilled. This means that the likelihood of originating downhole problems is very high indeed.

With a continuous circulation system, however, a downhole steady-state condition is naturally maintained. This means that the formations do not suffer from pressure oscillations, hole-cleaning improves, and the ability to pump out of the hole for extended intervals usually means the string can be moved until it is inside the previous casing, thus reducing the chance of problems in open hole.

Over the course of my career, I have drilled more than 150 wells onshore and offshore with continuous circulation, always reaching the target. Sometimes, continuous circulation made the difference, ensuring the achievement of the target, whereas this would not have been possible if the conventional stop-start drilling operation was utilised.

For all these advantages, continuous circulation is the first stage that all operators should considerer to drill all wells. Without interrupting the circulation safety and performance increase in any well condition, this technique will result in a drastic reduction of drilling time and costs with an early first oil production.

If a well is abandoned before reaching the target, it fails technical and commercial objectives

Moving towards full automation

One of the main targets of the oil and gas industry should be to move to fully automated remotely controlled drilling rigs. This results in improved safety standards and economic margins for drilling projects. This process will require the continuity of drilling operations, where the first target is the continuity of the first safety barrier on the well, the hydraulic barrier represented by the drilling mud.

A lot of data can be collected from circulating mud but every time we stop the mud circulation we lose the link with the bottom.

Continuous circulation will play a major role in the process of drilling automation because it ensures a continuous dialogue with the bottom hole, necessary to perform an accurate and effective remote control of drilling operations.

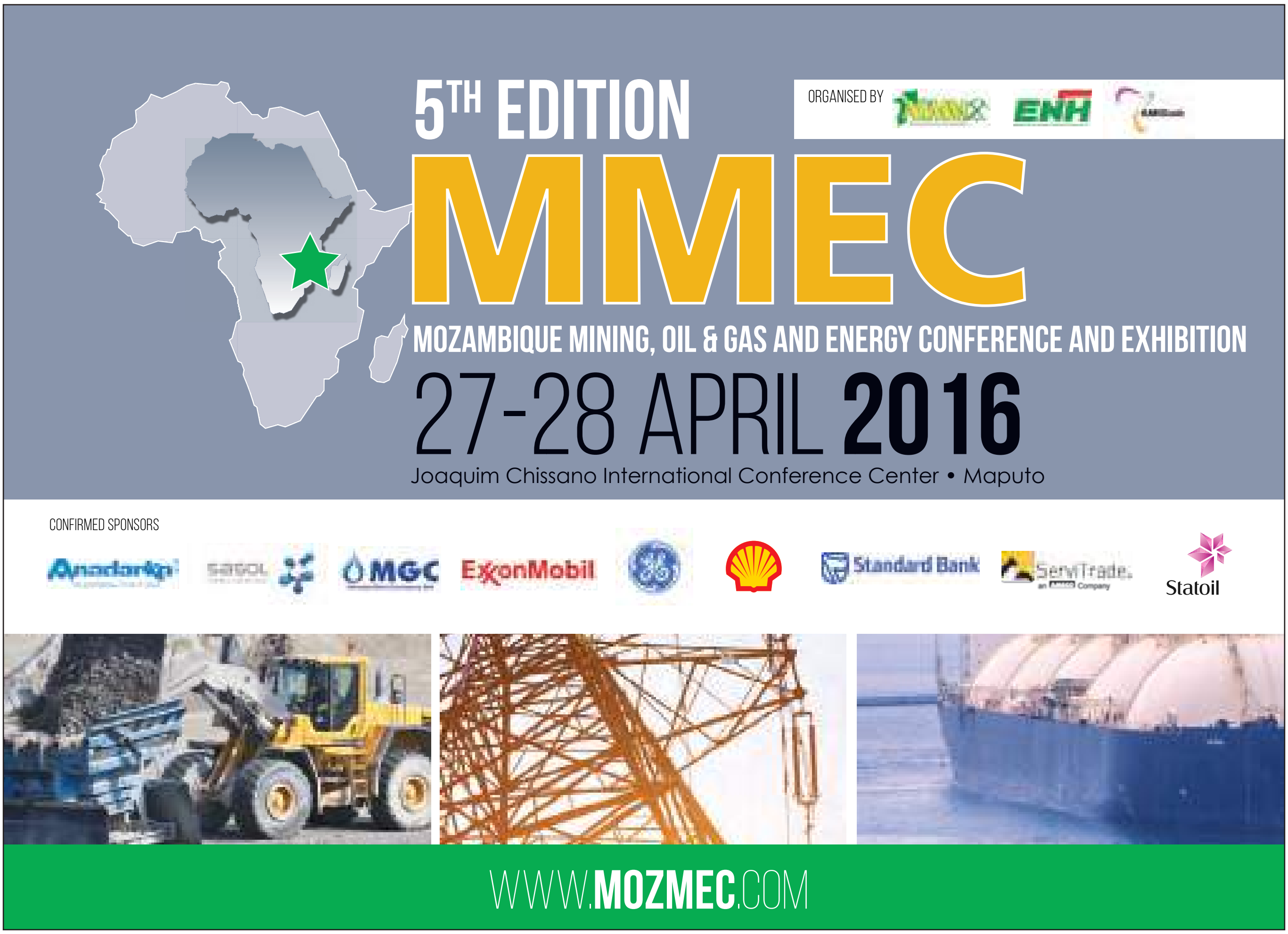
A new system

The HoD® – Heart of Drilling – is a cutting-edge package designed by Drillmec to prevent drilling accidents and improve drilling efficiency. The HoD combines continuous circulation system with an anti-friction device.

The HoD's Continuous Circulation system is designed to guarantee high safety standards on the drill floor, system components' reliability and easy and fast rig up-down in all rigs in operations, onshore and offshore.

The continuous circulation, hub of the HoD package, is composed of a set of HoD valves (Drillmec patent pending), integrated in special subs mounted on top of each drilling stand used to drill the well phases with continuous circulation.

Subs are compatible with all sizes of drill pipes, from 4½" to 6⅝", and their inside diameter allows wireline intervention if needed. Their design is also flexible and can be scaled to customer specification. ■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Well integrity management has come a long way in the 25 years that Wood Group Intetech has been in business, says Dr Liane Smith, the company's managing director and founder.

Well integrity management past, present and future

THE SEEDS OF modern well integrity management were sewn in the early 1990s, in the fields of corrosion assessment and materials selection. Even as recently as 12 years ago, it was still a function struggling for definition. With only a bare understanding of the terminology, it was seen by many in the industry as a reactive process for analysing well failure, rather than a proactive function that could extend the life of the well.

Today, well integrity management is a hot topic in the industry, the development of which has coincided with and been driven by a number of factors. There is the tightening of regulation around health, safety and the environment. There has been growing awareness that working towards the long-term sustainability of wells and platforms can deliver much more than short-term safety measures. And there have been significant developments in information technology to enable far greater levels of automation and data management, making advanced analysis and real-time assessment possible.

Nonetheless, the industry's current experience of well integrity management remains fairly broad. Some companies have yet to embrace well integrity management as a dynamic, automated and real-time risk and asset management process. They have turned paper records into electronic ones, and have a dedicated folder in their office-based system, but that is about as far as they go.

More forward-thinking operators have attempted to instil more of a management approach

These businesses still find it hard to add context to new information as it comes in. They don't have ready access to the inventory of equipment installed on wells – instead they have to search through different documents to see what a given well looks like, and piece details together to find out what is installed on it. These companies still face operational inefficiencies and can end up prioritising work that is not critical.

More forward-thinking operators have attempted to instil more of a management approach by using generic spreadsheets to record well information. Depending on the parameters they choose, this enables them to identify which

Dr Liane Smith, managing director and founder, Wood Group Intetech

wells look worse than others and develop some form of risk ranking capability. It is, however, still very manual and prone to human error.

More problematic is the fact that a spreadsheet can only provide a snapshot of what's happening. Whether data is updated once a week or once a month, it still doesn't provide trending information or give users the ability to look at historical data and identify recurring anomalies or issues.

Real-time capability

A growing number of proactive operators are integrating more data-driven and specialist well integrity software into their operations. Greater well instrumentation along with a drive for more automated data collection, has created a situation that lends itself to using database software systems that can process and analyse data in real time.

This is the immediate future for well integrity management: a move away from tolerating daily or weekly snapshots of well activity to insistence on a real-time capability that enables operators to respond quickly to any change in circumstance or potential problem. This kind of software can identify immediately when a well goes out of its safe operating envelope and alerts relevant personnel that there is something that needs attending to. These kinds of database system give operators all the information they need about the well in a single view, plus access to background documentation. An efficient, single source of truth, the system is easy to interrogate so that pertinent information can be readily extracted.

Crucially, it also ensures that everyone involved in a well's management has access to exactly the same information at exactly the same time. When decisions have to be made regarding clashing priorities, everyone involved understands the precise status of the well.

Greater automation also allows for global pooling of non-proprietary data for better understanding of operational effectiveness. For example, by comparing performance of a piece of equipment in use on the North Sea with other deployments of the same kit worldwide, operators can see whether their installation has a below or above-average lifespan. From there, they can establish whether it is the environment that is affecting performance, or whether training, maintenance or other controllable factors are at play.

As the idea of the digital oilfield becomes more firmly established in the industry, this type of system will be seen as the standard to aspire to. We are already seeing more and more operators opting for dynamic, real-time data over static snapshots to give decision-making an immediacy it did not have previously.

This serves two purposes: on the one hand it helps operators identify whether they have a problem that needs immediate mitigation. On the other, it enables a degree of production optimisation where operators can set and monitor an individualised safe operating envelope for each well. In other words, well integrity becomes an enabler of smarter well management.

Balancing act

For operators currently wrestling with rapidly diminishing margins caused by the precipitous drop in the oil price, this is welcome news. The oil business has always been a series of careful balancing acts between safety, profitability, efficiency and regulation. The current market conditions have thrown that into stark relief, and highlighted where the industry has been running itself too expensively.

Those that have implemented modern well integrity management software are in a better position to address some of the resulting challenges and ensure that every dollar spent on the well brings in a return.

Companies that have real-time insight into the status of their wells can optimise operations to extract maximum value out of their assets – at minimum cost. By providing operators with a realistic view of a well's risk status, essential interventions like chemical treatment or well

We are already seeing more and more operators opting for dynamic, real-time data over static snapshots

workovers can move to an appropriately timed schedule rather than sticking to an automated, but possibly over-cautious, timetable. Unnecessary shut-downs are minimised, maintenance time is optimised, and even the use of a descaling or anti-corrosion agent becomes more efficient – without compromising safety or production.

We are also seeing an increasing drive from operators interested in extending the life of existing wells that had previously been considered at the end of their life, or even bringing older well sites back into production after being suspended for long periods. The same system that can assess real-time operations of live wells can determine whether there is value to be gained from rehabilitating old wells with relatively straightforward casing patches or tubing replacements. It could deliver another ten years of active service at a fraction of the cost of drilling a new well.

Further into the future, well integrity will play an important role in shale gas operations. There is plenty of scope for optimising equipment to prevent well leakage, and ensuring much faster detection of and response to potential leaks. In particular, it can support the smart control of chemicals injected to achieve optimal fracking characteristics. Equally important, well integrity can provide the reassurance and confidence that will be needed to bolster public support for the shale gas sector.

Well integriy will play an important role in shale gas operations in the future (Photo: NeonLight/Shutterstock)

Well integrity management has become a proactive, highly automated, data-driven process. It is just one example of the big data phenomenon that has swept through every industry, and an illustration of how that 'data lake' can be turned to advantage.

With high-performance software offering real-time insights, it will be a vital component for realising the digital oilfield. And whatever developments are to come, its foundations in comprehensive corrosion and structural analysis, and consistent focus on long-term sustainability, will ensure well integrity management remains a major success factor for operators for a significant time to come. ■

Investment in technology, particularly partnerships between western suppliers and their African clients, is tipped to help West Africa emerge strongly when oil prices upturn. Nnamdi Anyadike reports.

West Africa's subsea growth driven by technology

INFIELD SYSTEMS LTD, the UK provider of data and analysis for the offshore oil and gas industries, is confident that the development of West Africa's offshore will remain strong. This is despite the effect of lower oil prices, which Douglas-Westwood, a market research provider, warns will continue to suppress mobile offshore drilling unit day rates, until at least 2017. Catarina Podevyn, an associate at Infield, anticipates robust demand growth through to 2018 in the sub-region, driven by Angola.

To support this enhanced subsea activity, a swathe of new subsea technologies is being deployed. These can roughly be categorised under three headings: field development, sub-sea processing and production enhancement. Clustered satellite solutions tied back to floating production storage and offloading (FPSO) vessels are gaining ground and there is an increasing interest in subsea processing.

Major offshore projects

Total's $9 billion Pazflor subsea gas-liquid project in Angola is being touted as the "first in the world to use a plan, based on separation on the ocean floor spanning several sub-sea reservoirs."

Total's offshore Moho project provides another subsea technology first for Africa. The Moho Phase 1b project, located 75 km offshore Pointe-Noire in Congo-Brazzaville, involves drilling 11 wells in water depths ranging from 750 metres to 1,200 metres.

The company claims that the two subsea multi-phase pumps are "the most powerful installed anywhere to date". The field is tied back to the floating production unit on the Moho Bilondo field. Work is continuing on the nearby Moho Nord development. When complete it will add a further 100,000 boe/d of capacity.

In February, Seadrill, the Bermuda-based deepwater drilling contractor, secured a two-year contract offshore Angola for the semi-submersible West Eclipse. Work is due to start this year. Also in February, Fugro Subsea Services Limited – the provider of integrated geotechnical services to the offshore oil and gas industries – was awarded a contract by Technip SA, the engineering and construction project management company.

Fugro will provide advanced deepwater survey and positioning services for seven installation vessels and construction support vessels offshore Angola for the Kaombo project. The contract begins in second-half 2016 and will continue into early 2018.

Offshore workers off the coast of Congo-Brazzaville change shift at dawn. (Image credit: Papagaio-pirata/Flickr)

Other activities in the west

Subsea 7's autonomous remote intervention technology division, i-Tech, has secured contract extensions from two separate offshore Equatorial Guinea operators for a period of three and five year's respectively. i-Tech will provide a suite of bespoke services, including the supply of ROV's, intervention tooling, surveys and inspections. These will be managed from i-Tech's operational base in Equatorial Guinea's capital Malabo.

Ocean Installer has been contracted by the indigenous Nigerian company Folawiyo Aje Services to provide offshore construction services for the Aje Phase 1 project. The Aje field is in the Benin basin and located 24 km offshore western Nigeria, in a water depth of roughly 900 metres. The scope of the work includes mooring buoy installation and hook up, as well as flowline and umbilical installation. The company's construction support vessel Normand Vision is understood to have commenced operations.

Technology transfer continues to be the buzzwords to define the new relationship between the largely western subsea technology suppliers and their African clients. Over the past year, Harkand, the UK provider of subsea capabilities and services, has established joint ventures for subsea projects in Nigeria and Ghana. In February, the company together with ESOPEG, the Angolan supplier of offshore vessels, signed a joint venture to create a new company.

The new company, Harkand Angola, will focus on developing local information rights management capabilities. These will provide technical support and local content to a range of subsea projects.

These and other developments should serve to put offshore West Africa in the driving seat in the use of subsea technology over the coming years.

Catarina Podevyn says that the region is fortunate in that several capital intensive field developments were sanctioned prior to the oil price decline.

Over the five-year period to 2020, Infield Systems anticipates expenditure in Angola to focus on three pre-salt developments: Cameia Mound, Cameia (Phase 2), and Bicuar.

From now until 2020, Infield Systems expects 54 fields offshore Nigeria to require capex, with Total-led developments anticipated to form 38 per cent of demand.

Ghana is forecast to remain the third-largest destination for operator capex offshore West Africa, driven by the TEN (Deepwater Tano) developments. Tullow's Mahogany East and the Eni-operated Sankofa OTCP are also anticipated to require substantial investment in the next five years.

Equatorial Guinea is expected to undergo a capex demand compound annual growth rate (CAGR) of 13 per cent, to 2020. The catalyst for Equatorial Guinea's demand growth is expected to be Ophir's Fortuna FLNG project, which is forecast to comprise 28 per cent of the country's offshore capex demand up to 2020. It is anticipated to see its final investment decision by mid-2016, with Infield Systems currently forecasting installation to be completed by 2019.

West Africa is demonstrably better positioned than most other offshore oil and gas producing regions in the world to take advantage when the inevitable upturn happens. ■

The fifth Mozambique Mining, Oil and Gas and Energy event will be conducted with a spirit of optimism in regard to the East African country's prospects.

Oil and gas industry leaders to converge on Mozambique

D*ESPITE TUMULTUOUS TIMES* in the oil and gas industry across the world, up and coming projects in East Africa are offering some optimism to operators and investors. In particular, Mozambique's burgeoning gas industry is offering hope. Substantial natural gas reserves have been established in Mozambique and the country is expected to become an important producer of natural gas in the medium term.

In 2000, Mozambique's first offshore licensing round was launched, and the ongoing hydrocarbons activity since then has been a catalyst for the bi-annual Mozambique Mining, Energy, Oil & Gas (MMEC) event. This year, the fifth edition of MMEC will be held in Maputo from 27-28 April at the Joaquim Chissano conference centre.

The last MMEC conference

MMEC was last held in 2014 with leaders from the oil and gas industry, as well as mining and energy, coming together to network and share ideas. It attracted 60 exhibitors and 600 delegates from 32 countries.

There were three major oil and gas sessions at the fourth edition of MMEC. At the first session, 'Insights into the evolution of the legal and fiscal frameworks regulating Mozambique's oil and has industry', delegates heard from representatives from Sal & Caldeira, Ernst & Young, and the Instituto Nacional de Petroleo.

The second session discussed gas development and monetisation plans with presentations from ENH, JGC Corporation, Fluor and Sasol Petroleum International.

MMEC 2016 has the ambitious theme of 'connecting investors, policy makers and industry leaders to drive economic and social development in Mozambique

Downstream incentives and opportunities were outlined in the final session featuring insights from the Matola Gas Company, Anadarko and Petromac.

Gigawatt Moçambique is one of many companies returning to participate at MMEC 2016 after a successful conference in 2014. Johan de Vos, the company's managing director, will be speaking at this year's event.

MMEC 2016

This year, MMEC has been organised under the theme of 'Commecting investors, policy makers and nsutry leaders to drive economic and social development in Mozambique'. It is an ambitious theme that gives leaders across all sectors represented at the event the chance to demonstrate how they can contribute to growth in Mozambique.

Before the oil price drop at the end of 2015, Mozambique reported solid GDP growth, at 5.9 per cent in the first quarter, with the extractive industries one of the main drivers of this positive performance. There was a slump in GDP growth in the second quarter, when it dropped to just 1.1 per cent but by the third quarter, GDP growth was picking up again at 1.8 per cent.

According to The Economist Intelligence Unit, Mozambique's real GDP is projected to grow by seven per cent annually between 2016 and 2020.

With these projections in mind, MMEC will aim to be a showcase for investment opportunities in the exhibition, as well as a chance to learn more about these opportunities, improvements in regulation and governance, and big picture development issues during the conference sessions.

A wide range of companies and organisations are represented in the confirmed speakers for the event, including Fluor Mozambique, Aggreko, Standard Bank, Matola Gas, Funae, Gesto Italia, Hidroeléctrica Cahora Bassa, the National Council for Electricity, Gigawatt Moçambique, and the Maputo Corridor Logistics Initiative. ■

Maputo, the capital of Mozambique, is set to become a hub for East African gas development. (Nuno Rosrio/Flickr)

Industry leaders from government and the private sector will be on hand to outline their vision for the future of Nigeria's oil and gas industry at the 16th edition of this prestigious conference, scheduled to be held in June 2016.

President Buhari to open Nigeria's 16th annual Oil and Gas conference

THE PRESIDENT MUHAMMADU Buhari has been confirmed to deliver the Presidential Address at this year's edition of the Nigeria Oil and Gas Conference and Exhibitions (NOG16) in Abuja, the organizers of the event, CWC Group has revealed.

A critical time for the oil and gas industry

According to some oil and gas industry players, the President's participation in this year's event is highly anticipated as they seek Federal Government's intervention in the face of global challenges.

The price of crude has dropped to record levels forcing many in the industry to cancel or suspend key projects and investments as well as record significant numbers in job losses.

NOG16 will serve as the platform for the government to showcase the direction in which they are taking the oil and gas industry in the years to come.

Commenting on this year's event, Dr. Alirio Parra, former Minister of Mines and Energy, Venezuela and Member of Board, CWC Group said: "NOG now in its 16th year has become an extraordinary event in the Nigerian and international energy calendars. It brings together policy makers, operating oil companies, technology innovators and local manufacturers in an open and free discussion and debate that has the potential for developing new strategies for growth and investment".

Leaders of international oil companies, independent producers, international and indigenous service providers, and industry associations will all be present at NOG16.

President Muhammdu Buhari will be opeing NOG16 in Abuja on 13 June.

Top-level speakers

Alongside President Buhari, other high level government officials who will be participating in the four-day event include the Minister of State for Petroleum Resources, H.E Dr. Emmanuel Ibe Kachikwu, other Ministers of the Federal Republic, senators, senior government representatives from the Ministry of Petroleum Resources, NNPC and its subsidiaries.

Also participating will be leaders and top management of international oil companies, independent producers, international and indigenous service providers and industry associations.

Networking opportunities

In addition to the participation of who-is-who in the oil and gas industry, CWC said this year's event will provide unrivalled networking opportunities, bringing the entire value chain under one roof and connecting participants to the right people in order to add value to their businesses.

A diverse programme

According to the programme of events seen by our reporters, the first session tagged How Will New Legislation & Policy Develop to Transform the Oil & Gas Industry? will focus on issues such as the policies needed to enhance the Nigerian oil and gas industry's competitive edge, the changes in legislation and policy that industry players want to see as well as how the government is interacting with the industry to develop policies among others.

Taking place from 13-16 June 2016 at the ICC, Abuja, NOG brings together the best of oil and gas industry professionals, investors, governments, financiers and others from across the globe. For more than one and a half decades, NOG has been developed in partnership with the Ministry of Petroleum Resources and NNPC. The last edition of NOG attracted over 250 companies showcasing the latest technology and services in oil and gas industry with about 6000 visiting from various parts of the world. ■

www.cwcnog.com

As ever, there will be plenty of networking opportunities at this year's NOG event in Abuja.

Tank World Expo 2016 has finalised its speaker list for this year's event, which will also feature exhibiting companies lining up to launch and showcase new innovations and technologies in the Middle East and African markets.

Tank World Expo's line-up reveals future plans for tank storage industry

TANK WORLD EXPO 2016, the only event for the Middle East and African tank storage markets, has finalised its speaker line-up. The conference programme will host at least 18 leading industry speakers, from organisations such as The UAE Ministry of Energy, OTTCO, Oiltanking Odfjell Terminals Oman, Dubai Mercantile Exchange, Burgan Cape Terminals and CITAC Africa.

The event, which takes place at the Dubai World Trade Centre on 12 and 13 April 2016, provides industry professionals from all over the world with the opportunity to listen and learn from a series of educational seminars, delivered by leading lights from the tank storage sector. The programme will cover everything from developments in Oman and future developments in Fujairah to oil prices and the African bulk liquid storage sector.

There will be a strong focus on Oman throughout the 2016 conference programme, reflecting the transitioning marketplace. Andrés Suárez, general manager at Orpic Logistics, Oman, will present an overview of the Muscat-Sohar Pipeline Project (MSPP) and discuss Oman's potential to become a logistics hub followed by Said Al Mawaali, project director at OTTCO, who will be presenting the latest developments at the region's largest storage facility in Oman. Roderick de Rooij, commercial manger at Oiltanking Odfjell Terminals Oman, will discuss the future outlook for the storage market in the region. He will outline how to capitalise on the trade routes between Asia and Europe, while analysing the region's demand for storage capacity.

There will be strong focus on Oman and Africa throughout the 2016 conference programme, reflecting the transitioning marketplace.

Africa is another major focus for 2016, with Amrita Sen, chief oil analyst at Energy Aspects, examining regional supply, demand, trade flow and downstream capacity across MENA, followed by Gary Still, executive director at CITAC Africa, who will outline how to assess storage capacity and infrastructure across Africa in relation to product flow. Muziwandile Mseleku, CEO of Burgan Cape Terminals will also discuss the region, looking at the opportunities within the African bulk liquid storage sector. The Tank World Expo conference will also feature specialist technical sessions. Per Cato Roed, managing director at BMT Asia Pacific, will cover the use of simulation and modelling in the design and development of bulk liquid storage facilities, while Riyad Sulaiman, capital investment planning engineer at Saudi Aramco, will take a look at advanced analytics for terminal investments. He will also discuss scenario planning, rational valuation under uncertainty, and real options analysis.

The event will feature the leaders of tank storage industry coming together. (Photo: jcg_oida/Fotolia)

Companies are also using Tank World Expo to launch new innovations and technologies to the Middle East and African markets. Terminal managers, technicians, engineers and other tank storage professionals who attend the show will see innovations from right across the supply spectrum, from major names, including Emerson Process Management, Kanon Loading Equipment and Endress+Hauser through to the sector's most innovative niche suppliers.

Knowsley SK will be displaying its latest foam mixing technology – the Turbinator. Designed to accurately mix foam concentrate liquid with either freshwater or seawater, the Turbinator is suitable for use in fixed systems or mobile units. Arflu Industry Valves will be presenting its dual expanding plug valve requiring little maintenance and offering a verifiable double block and bleed service, plus a long lifetime. Climbex S.A. will be showcasing the fully automated mobile ORECO units for cleaning petroleum tanks, including decanter and disc separators. This system works in an inert atmosphere, constantly monitoring the levels of oxygen in a tank, stopping if the maximum permissible concentration level is exceeded. Tranter Heat Exchangers will be exhibiting its innovative range of storage tank heating coils, which are highly efficient, reducing site fabrication work significantly. The convection induced in the tank helps maintain a uniform tank temperature, reduces sludge settling and also lessens the need for maintenance. Loyal tank storage exhibitor, Loadtec Engineered Systems, will be highlighting its wide range of tanker loading arms. It will also present its portfolio of fall prevention systems, designed for safe access to road, rail and marine tankers. Mascoat will be demonstrating its latest coating – the Mascoat Industrial-DTI. This multi-purpose coating solves insulating and corrosion under insulation issues. Fort Vale will demonstrate its MK3 Safeload semi-automatic bottom loading coupler, with extended 'wrap around' trigger design. ■

Online course for exploring new technology

GRENOBLE ECOLE DE Management, in conjunction with a wide range of major players in the field of energy technology, will be launching a free MOOC (Massive Open Online Course). The first one commenced on March 14. The course explores upcoming technologies for solving the world's major energy challenges. It is aimed not only at students, but also professionals working within or with an interest in the energy sector.

The MOOC will provide participants with technical and business-oriented perspectives in regard to the issues at play in the development of new energy technologies, particularly as economies across the world are attempting to increase the use of renewables alongside fossil fuels in the energy mix. Six main areas will be covered in the course, including energy efficiency, biogas, hydropower, solar power, hydrogen energy, and smart grids and storage.

Participants will learn how to analyse and evaluate new technologies and explore their impact on the energy sector, and discover more about the how the energy technology marketplace is organised, as well as how the major players are addressing challenges, such as access to energy.

Over the six week course, it is expected that participants will spend approximately two hours per week using the MOOC website, as well as undertaking assigned readings.

The website will also feature a forum section where participants can take part in discussions and debates with other students as well as energy industry experts.

Industry leaders that have partned with Grenoble for this course are: Tenerrdis, Air Liquide, CNR, General Electric and Think Smart Grids. It is also supported by the French government.
The course can be accessed via www.en.grenoble-em.com.

Gas detection made easy and portable

DETECTING GAS LEAKS, particularly in confined spaces, is a safety challenge for many operators.

Gas Clip Technologies has developed the Multi Gas Clip Pump (MGC Pump) portable detector, which offers many benefits, particularly for small space applications.

The detector has an internal pump and its low-power photometric technology means it can run non-stop for five full days without having to recharge the battery. Additionally, it only requires calibration every six months and is operated with a single button.

It uses infrared sensor technology to detect combustible gases, and electrochemical sensing technology to detect hydrogen sulphide, carbon monoxide and oxygen. The detector is OSHA-compliant, with visual, vibrating and audible alarms.

Gas Clip Technologies has developed a user-friendly gas detector that is ideal for confined spaces.

Digital platform developed for reservoir data

A COMPREHENSIVE, INTUITIVE digital platform for reservoir data has been launched in a partnership between software company, WellDatabase and NUTECH, a Houston-based oil services company.

The platform, known as NuQuest, which is available as a subscription, provides standard well data coupled with corresponding reservoir characterisation and engineering information from industry leaders.

The engineering expertise is used to identify important reservoir parameters which impact on production, and can help unlock further production opportunities in similar areas.

NuQuest has aimed to create an affordable digital information source that allows for easy access to thousands of pieces of well analysis, including conventional and unconventional plays, from around the world. Subscribers will be able to access a wide range of information essential to fast, effective and informed decision-making, and reducing the risks associated with hydrocarbons development.

As well as providing a comprehensive analysis of the region's historical well data, the data is linked to proprietary reservoir engineering information and geological data.

"Our alliance with WellDatabase has extended NUTECH's bandwidth to another level," said Allen Howard, president and CEO of NUTECH.

"By joining forces with WellDatabase and launching NuQuest, we are providing our customers with the most inclusive service on the market, generating insights that create value otherwise previously unavailable."

"There are multiple offerings of well data services within the industry, but none that provide the opportunities for forecasting and comparatives as well as forward-thinking, efficient planning," said John Ferrell, founder and CEO of WellDatabase.

NUTECH has analysed nearly 100,000 wells globally, from small independents to super majors, in 80 countries, and specialises in reservoir evaluation and optimisation.

Shackles for safe subsea applications

AN EXPANDED RANGE of ROV shackles will be particularly beneficial for underwater and extreme weather condition operations. Van Beest has expanded the range of Green Pin ROV Release and Retrieve shackles with two new products.

The new ROV shackles are available with either a fishtail handle or a D-handle. They have been designed to be easily manipulated by a hydraulically operated ROV arm and the tapered pin ending means it is easy to assemble underwater.

Other benefits for underwater operators include the white-painted shackle body, green pin and orange handles for excellent visibility.

An example of the ROV shackle with the fishtail handle in easy-to-see bright orange.

The handles are interchangeable and attach to the pin head with bolts and Nord-Lock rings, for added safety.

There is also a groove for wire rope in the pin head to attach the pin to the shackle body, and the thread is completely chambered to protect your sling. These shackles are suitable for both inline and side loading.

Extreme temperature conditions are also catered for with these shackles as they have been tested to work in temperatures as low as -60°C and above 200°C.

Van Beest can supply the quenched and tempered alloy steel shackles with a works certificate, material certificate, manufacturer test certificate, and EC Declaration of Conformity.

They can also be supplied without wires so that operators can apply the best wiring for their specifications.

Specialist oil and gas MBA launched

EDINBURGH BUSINESS SCHOOL, the Graduate School of Heriot-Watt University, has launched a specialist MBA in oil and gas management. It has been designed exclusively for those working in, or aspiring to enter the hydrocarbons sector.

Students of the course will complete seven core courses as well as four specialist courses which include finance, project management, strategic planning and strategic negotiation.

The course offers flexibility with students able to either study from home or on campus in either Edinburgh, Dubai or Malaysia, or with the school's learning partners in Nigeria and Trinidad. From late 2016, the course will also be fully available online.

Miriam Nanyonga, a senior accountant with CNOOC Uganda, remarked that the specialist course covers "most of the areas a top decision-maker should be knowledgeable about, especially strategic negotiation".

www.ebsglobal.net

The Heriot-Watt Edinburgh campus. (Image credit: Iris/Flickr)

Cyber security solution for oil and gas

CYBER ATTACKS ARE costly to the global energy industry but the risk can be minimised with effective security software. SafePass Pro has been developed as an advanced cyber-security solution for IT systems within the oil and gas industry.

It works in multiple ways, improving network resources, minimising malware and spyware, enabling centralised control across all sites, and enforcing policies for acceptable use and security. Additionally, it offers customers the opportunity to assess and eliminate network vulnerabilities.

The Alert Logic threat monitoring service features a threat manager that provides network intrusion monitoring and detection and a vulnerability scanner, and the firewall protection supports URL filtering, application filtering and security.

As well as the advanced software, Harris CapRock, the developers, offer monitoring and support 24 hours a day. This means customers will have access to the company's industry-leading cyber-security experts who are on hand to detect system vulnerabilities, monitor insider threats, proactively defend networks and respond to incidents.

"Security breaches and emerging threats to corporate networks are impacting on the oil and gas market with greater cost and frequency as offshore operations rely more heavily on always-on communications networks," said Tracey Haslam, president of Harris CapRock. "SafePass Pro offers an unparalleled approach to cyber protection with the added ability of working with Harris cyber security experts committed to securing critical government networks."

Harris CapRock operates in 24 countries, with its African presence in Algeria, Angola and Nigeria. *www.harriscaprock.com*

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Interview

Dr Duncan Clarke, chairman of the board for Global Pacific & Partners, discusses the prospects for the African oil and gas industry across the different regions, and outlines where the investment opportunities lie.

What does the future hold for the African upstream sector?

What is the impact of the ongoing low oil price environment on the African upstream sector?
Africa's producer and exploration economies are taking a bigger hit in 2016, with much lower crude prices, and generic cutbacks in corporate spend on global and African E&P. Already, most countries in the upstream are in difficulty.

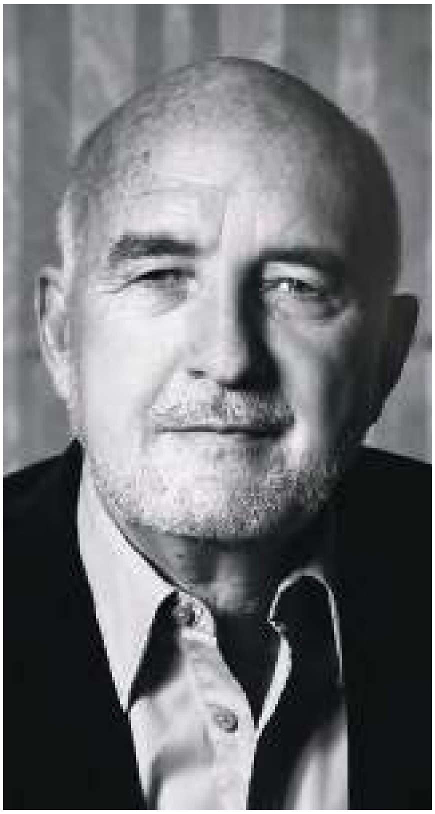
What about Nigeria and Angola in particular?
Nigeria's GDP growth rate has fallen, so too Angola's. State revenues are under huge pressure in both. Budget cutbacks have been mandatory. Currencies have depreciated. Debt issues have come to the fore. State oil firms are in trouble. Sonangol is in the midst of a major restructuring.

NNPC's future is still unsettled after the long saga of the Petroleum Industry Bill's emergence – still yet to finalise – and that some might see as the longest and slowest "train crash" in Africa's upstream evolution, notwithstanding asset gains made by local players. Yet even they are currently in difficulty, with capex constraints, financing problems, and in meeting all past commitments. A tough year is expected.

> "The fundamentals differ from West to East but neither is in the fortuitous situation that prevailed a year ago."

Are there differences in the upstream sector between West Africa and East Africa?
The fundamentals differ from West to East, with diversity in corporate players and depth, and short-term prospects, as well as in government strategies and for both foreign and local firms. Neither is in the fortuitous situation that prevailed one year ago, or even at the end of last year, given the oil price slide, global economic slowdown, and macro-conditions in East Asia and China. In both zones, corporate players face the same market milieu and industry dilemmas, encountering slowdowns in E&P, venture uptake, acreage leasing and upstream investment.

What role will foreign investment play in the growth of African upstream this year?
The super-majors are in the strongest relative corporate position yet, with independents and explorers suffering from capex cutbacks, difficulty meeting commitments, and tough financing conditions. For almost all independents, capital markets remain tough to access. Producers face weak global market conditions, and while projects in the recent pipeline can or will most likely continue forward, some have been set back.



Dr Duncan Clarke, chairman of the board for Global Pacific & Partners, foresees mixed fortunes across Africa for oil and gas operators.

Which companies are performing strongly in Africa at the moment? And where are operators currently struggling?
ENI and Total have prominent positions on the continent, with the "Italian Stallion" holding a larger growth portfolio built from recent acreage entries, developing ventures in Congo-Brazzaville, oil output growth in Angola, and gas discovery success. ENI's Egyptian Zohr gas field is slated for fast-track LNG, and in East Africa the Mozambique FLNG/LNG ventures remain stand-out projects, but with delayed FID, as is the case in Tanzania. Shell has taken over BG and its acreage and assets, enhancing its East Africa portfolio. And Total's oil production ambitions are stalled in Uganda due to oil pipeline politics, the heavy oil venture in Madagascar fell foul of low crude prices and unviable margins, while large South African deepwater acreages remain on the books, but elusive for near-term development. South Sudan is "no-man's land" for the near-term. Key players have exited Seychelles. Central Africa is dormant. Much of North Africa is struggling, perhaps bar Egypt.

Do you foresee E&P growth for South Africa?
The core economy is structurally weak and economic growth is waning, along with softness in the Rand, while the saga of finalisation of petroleum industry legislation remains to be completed. This fundamentally political drama has dragged on for a long while and generated much industry disquiet, although some signals appear to suggest it will be less onerous than originally planned. Even so, no major upstream investments should be expected, as all companies will be reviewing offshore portfolio and plans, and awaiting better times, and the stalled onshore shale gas game is yet to kick off.

What are the countries to watch this year in terms of growth and investment?
Rising oil output growth is slated for Ghana, large gas discoveries have reshaped the energy future outlook in Senegal, and Mauritania and Mozambique's LNG projects inch forward, along with FLNG in Equatorial Guinea and Cameroon, but all LNG is long-term. In this arena, Egypt seems likely to move fastest.

Do not expect much advance in exploration in Malawi. Zambia remains an upstream backwater, with Zimbabwe in a congenital mess save for minor CBM projects, and upstream hope in Kenya lies in acceleration of oil pipeline export routes from the north to the coast. Uganda is dithering on exploitation and oil evacuation routes.

Are there any differences between North Africa and the sub-Saharan countries?
Much of North Africa fell victim to the Arab Spring's consequences, while sub-Saharan Africa had enormous opportunity to move forward rapidly in 2010-15, yet many countries seem to have lost some momentum.

Last year's sharp unexpected downside in crude markets has mortgaged much immediate opportunity as the global paradigm has changed in unforeseen ways. ■