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Oil Review Africa

Covering the Oil and Gas Industries

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Europe €10, Ghana CD18000, Kenya Ksh200, Nigeria N330, South Africa R25, UK £7, USA $12

Egina deep water project attracts over $1bn investments

Ghana - remains a promising growth spot

Local content in Ghana

Engineering geophysics in downstream projects

Africa's emerging maritime trends

Tackling corrosion in Africa's refineries

Smart intelligent wells for optimum performance

Tougher times

await Nigeria's O&G industry

Chief Oladipo Jadasimi, chairman of Lagos Offshore Logistics Base Ltd. - See pages 20-22.

REGULAR FEATURES: ■ News ■ Contracts ■ Events Calendar ■ IT update ■ Company profiles ■ Products & Innovations

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Editor's note

AS A FRONTIER market, the countries of Africa represent both tremendous opportunities and tremendous risks.

The oil price has plunged 60 per cent from last year's high of US$115 a barrel, resulting in investments and explorations being cut back. Fortunately there is some good news. Guy Maurice, head of Total's Africa-focused exploration and production work, has said that three big projects that were greenlighted recently will still go through: the Egina project in Nigeria, Angola's Kaombo Field and the Moho Nord Field in the Republic of Congo. All three are scheduled to come online by 2018.

Eni has also given the go ahead for its US$7-bn Offshore Cape Three Points project in Ghana. This project will tap 1.45 tcf of gas and 500mn barrels of oil. Oil will flow in 2017 and gas later in 2018 with peak production expected at 80,000 boed.

As always we bring you news of the latest oil and gas developments as well as features and analysis on topic issues. Please do get in touch with your feedback and any suggestions of topics you would like to see covered.

Senior drilling supervisor with trainees on board the Sedco Energy during drilling of the Owo-1RA well, offshore Ghana.

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Executives Calendar 2015

MARCH			
4-6	**7th East African Petroleum Conference & Exhibition 2015**	KIGALI	www.eac.int/eapce7
13-15	**Angola Recruitment Summit**	LISBON	www.eliteic.net
14-15	**Recruitment Summit - Cape Verde, Guinea-Bissau, Mozambique, São Tomé & Principe**	LISBON	www.eliteic.net
16-17	**African Extractives: New Actors and Alliances to Overcome Enduring Challenges**	LONDON	www.africa-energy.com
16-19	**Nigeria Oil & Gas**	ABUJA	www.cwcnog.com
16-19	**Nigeria Power**	ABUJA	www.nigeriapower.com
17-19	**Decommissioning & Abandonment Summit 2015**	HOUSTON	www.decomworld.com
18-19	**Africa Future Energy Forum**	NAIROBI	www.africafutureenergyforum.com
22-24	**Upstream West Africa 2015**	ACCRA	www.upstreamwestafrica.com
25-27	**OMC 2015**	RAVENNA	www.ies.co.it
APRIL			
10-11	**Angola Recruitment Forum**	CAPE TOWN	www.eliteic.net
22-23	**Ghana Summit**	ACCRA	www.cwcghana.com
22-23	**Africa Upstream and Downstream Conference**	ABUJA	www.s-scg.com
22-24	**2nd Congo International Mining Conference & Exhibition**	BRAZZAVILLE	www.ciemcongo.com
27-29	**4th East Africa Oil & Gas Expo 2015**	NAIROBI	www.expogr.com
29-30	**8th Annual Sub-Saharan Africa Oil & Gas Conference**	HOUSTON	www.energycorporateafrica.com
29-30	**M2M for Oil & Gas**	LONDON	www.smi-online.co.uk
MAY			
4-7	**OTC 2015**	HOUSTON	www.otc.net
12-14	**Oil & Gas Fundamentals**	JOHANNESBURG	www.cwcschool.com
19-20	**Platts Global Crude Oil Summit**	LONDON	www.platts.com
20-21	**2nd Uganda Mining, Energy and Oil & Gas Conference and Exhibition**	KAMPALA	www.umec-uganda.com
20-22	**Petro.t.ex Africa 2015**	JOHANNESBURG	www.exhibitionsafrica.com
26-28	**12th Africa Independents Forum**	LONDON	www. petro21.com
JUNE			
1-5	**26th World Gas Conference**	PARIS	www.wgc2015.org
3-5	**Oil & Gas Fundamentals**	CAPE TOWN	www.cwcschool.com/events/oil-gas-fundamentals-2
8-10	**Negotiation Skills in Oil & Gas**	LAGOS	www.cwcschool.com/events/negotiation-in-oil-gas-6
10-12	**Oil & Gas Mini Management & Business Administration**	LONDON	www.cwcschool.com
18-19	**5th Zambia International Mining and Energy Conference and Exhibition**	LUSAKA	www.zimeczambia.com
23-24	**2015 African Assembly**	PARIS	www.oilcouncil.com

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

Ghana Summit in high demand

THE GHANA SUMMIT, which is to be held in Accra 22-23 April, is an exclusive combination of a word class conference with an exciting exhibition showcasing the latest developments. Due to the success of the 2014 conference and in response to a high demand, the Ghana Summit has been expanded to include an international exhibition.

The Tullow stand at last year's Ghana Summit.

The 2015 Conference & Exhibition guarantees to attract all the major decision makers in Ghana, and internationally. This esteemed gathering of leading industry professionals, endorsed by the Ministry of Energy and Petroleum, GNPC, the Petroleum Commission, VRA, ECG, GNGC and GRIDCo aims to showcase opportunities and stimulate further investment into Ghana.

In addition to the conference, there will be a unique roundtable discussion, exclusive to Ghana Summit attendees, which will provide the opportunity for both local and international oil and gas companies to showcase their offerings and source partners for operations moving forward.

Powering Africa: Nigeria 2015

ACCORDING TO A recent Bloomberg report, Nigeria aims to almost triple its natural gas production capacity by 2020 to help meet the West African nation's power and industrial development needs.

Nigeria is moving very aggressively into gas for industrialisation purposes and gas-to-power is a key issue for the nation. There has been significant investment in this sector and the fast approaching Nigeria Power Forum 2015, which will take place 16-17 April in Lagos, will address key issues.

The meeting will explore different financing models to support market developments and power projects, as well as feature case studies of live projects led by leaders and their partners. Discussion topics include bankable strategies for gas supply and utilisation, finance options to mobilise long-term capital, IPP and embedded power projects, financing energy infrastructure and more.

The content-led programme of Powering Africa: Nigeria 2015 aims to support Nigeria's economic development, bringing the industry's key players in one place to invest and grow the country's energy sector.

East African boom on its way

THE INTERNATIONAL ENERGY Agency predicts that by 2040 sub-Saharan Africa will be producing more natural gas than Russia, with much of it coming from Tanzania and Mozambique.

Kenya and Uganda are also preparing their own hydrocarbon booms, but much remains to be done in 2015 to speed up production and deliver benefits to local economies.

The Kenyan government, which is begrudgingly devolving power to the county governments created through the 2010 constitution, plans to implement new legislation in the year ahead to shape the oil and gas industry. It could include a windfall tax, which companies say will scare away investment.

The government nevertheless expects a flurry of exploration in 2015 as holders of 41 exploration licences enter the latter stages of their permits. The energy ministry estimates that proven reserves will soon rise above 1bn barrels.

The development of the oil fields in the South Lokichar Basin, where there is an estimated 600mn barrels, is part of the ambitious Lamu transport corridor project.

Nairobi and Kampala are evaluating bids for the construction of a joint oil export pipeline.

An announcement on Uganda's plan for a refinery is expected soon after a decision on choosing contractors was postponed in 2014.

Mozambique and Uganda both plan to issue a round of new licences in early 2015.

Developments in Tanzania are likely to be delayed by political wrangling.

The country is due to hold national elections and a constitutional referendum in 2015.

Meanwhile, two top directors of the Tanzania Petroleum Development Corporation were arrested in early November for their failure to publish the production-sharing contracts that the government had signed with oil and gas companies.

The government has dragged its feet over creating gas policy and only set the meagre goal of training 300 people to work in the industry by 2020, suggesting that the gas boom will not lead to a concomitant boom in employment.

While companies are deciding on whether to build liquefied natural gas plants in Tanzania and Mozambique, Tanzania is directing a portion of its gas reserves to the electricity sector.

Norway's Yara International began talks in 2014 on the possibility of setting up a gas-powered fertiliser plant in Tanzania or Mozambique.

Uganda's Kigumba Petroleum Institute, which became operational in 2010, has worked to overhaul its curriculum with the help of oil companies, and plans to graduate 160 students in the 2016/2017 academic year.

The protests at Tullow's blocks in Kenya in 2013 and the riots in Mtwara in Tanzania during the same year are reminders about the dangers of mismanaging the expectations that the prospects of oil and gas can bring.

Total to push ahead with major African projects

TOTAL'S MAJOR OIL and gas projects in Africa will not be stopped by the sudden fall in crude oil prices and will help the French company meet its long-term production targets, a top executive said recently.

Total has bet on a string of African projects such as Egina in Nigeria, Kaombo in Angola and Moho in the Republic of Congo to help it boost production to a target of 2.8mn boed in 2017.

These are West African projects in deep and ultra-deep water - an area where Total is a self-proclaimed specialist but that require costly technologies.

"These projects have been engaged and we certainly won't stop them, which means thousands of jobs will be preserved for projects up to a 2017-2018 horizon," Guy Maurice, the head of Total's exploration and production branch in Africa told reporters on the sidelines of a conference.

"All the big projects are in the pipeline today. This will allow us to meet our production targets for 2017-2018 as planned," he said.

He said the recent drop in oil prices will prompt the group to review certain projects in Africa, country by country, but that no major project was at a stage that required a final investment decision.

"What could come up tomorrow, in 2025 or something, is not at a pre-sanction stage, it's still very early in the study phase, we're not in a phase when we have to arbitrate between doing it or not," he said.

He said Total would work with partners - subcontractors and producing countries - to help bring the cost of projects down, on the model of what was achieved with the Kaombo project in Angola, which was launched after a US$4bn reduction in costs last year.

"Half of the reduction came from us, we changed our requirements, a quarter from our suppliers, and a quarter from the Angolan government, which has accepted a lower level of local content," he said, referring to producing countries' increasing demands for the use of often more costly local suppliers and untrained staff for oil projects.

Intersec 2015 wrapped up with record turnout

INTERSEC 2015, WHICH took place from 18-20 January in Dubai, witnessed a 10 per cent growth in visitors, reflecting the strong demand in the Middle East security market that is growing at double the 5.5 per cent global growth rate, according to analysts Frost & Sullivan.

The record visitor numbers were treated to the latest safety and security solutions of 1,233 exhibitors from 52 countries.

Ahmed Pauwels, CEO of Messe Frankfurt Middle East, organiser of Intersec, said: "The response to Intersec 2015 has been tremendous from both exhibitors and visitors alike, and the record participation this year lays down another important marker in the show's continued development.

"The big shift this year is twofold; more visitors are now end-users across a variety of industries, which indicates they are increasingly more involved in the decision-making process when it comes to purchasing security-related products and services.

"This is reflected in the amount of deals that are actually being made during the show, and the feedback we are receiving from exhibitors is that business has been very good as a result," added Pauwels.

The business potential for major security players in the Middle East and African market is further underlined by visitors to Intersec evaluating the show as potential exhibitors.

Marwan Khoury, marketing manager for the Middle East and Africa at Axis Communications, said: "The adoption rate in the GCC is one of the highest in the world when it comes to IP technology.

"This is why we often use Intersec to release new products, as it's a very demanding market. The show is very important for the evolution of the regional security market, and we've seen a lot of changes over the past four years which is changing the way we do business."

A business-as-unusual outlook for oil in the medium-term

THE RECENT CRASH in oil prices will cause the oil market to rebalance in ways that challenge traditional thinking about the responsiveness of supply and demand, according to the International Energy Agency (IEA)'s annual Medium-Term Oil Market Report (MTOMR) just released.

The US light, tight oil (LTO) revolution has made non-OPEC production more responsive to price swings than during previous market sell-offs, the report said, adding that this would likely set the stage for a relatively swift recovery. At the same time, lower oil prices will not provide as strong a boon to oil demand growth as might be expected. A combination of cyclical and structural factors will keep the demand response to lower prices relatively subdued, and demand in several key oil exporters will be hurt by the revenue loss. Nevertheless, global demand is now expected to grow slightly faster than supply capacity.

Dyna-Mac wins Bumi Armada FPSO contract

The FPSO will be deployed at Eni's block 15/06 East Hub field.

DYNA-MAC HAS secured a US$44-mn letter of award to construct six units of FPSO topsides modules for Armada Cabaca Ltd, an affiliate of Bumi Armada Berhad.

Dyna-Mac's scope includes detailed engineering and the fabrication of the six units of topsides modules for an FPSO to be deployed at Eni's block 15/06 East Hub field in deepwater offshore Angola. The topsides FPSO modules are scheduled to be delivered progressively to the owner within 1Q 2016.

The FPSO will be capable of crude oil production rate of 80,000 bpd of oil with a storage capacity of 1.8mn barrels and 120,000 bpd of water injection, and 3.4mn cmd of gas handling capacities. The fourth generation FPSO, currently undergoing conversion from a very large crude carrier, will have a topsides weight of 15,000 metric tons and will be moored at a water depth of 450 metres. First oil is targeted for 4Q 2016.

Romanian metering company on African map

THE METERING SYSTEMS for oil and gas is becoming ever more important. As the prices for oil and natural gas have decreased dramatically in the last months, instrumentation and process control companies such as Syscom 18 could still sustain the production delivering reliable systems at affordable costs for the oil and gas companies not only in Europe, but also in Africa, the Middle East and Asia.

Most of the underground natural gas storage facilities in Romania, Syscom18's country of origin, are measured by fiscal metering stations manufactured by the company. These stations (bidirectional, using ultrasonic flow meters and turbines for verification, GCs for calorific power calculation) are measuring the natural gas very accurately during injection or extraction phase. Good reliability and competent metrological services represented the base for more new orders for natural gas metering stations on behalf of Romgaz, Transgaz or Petrom - big national oil and gas companies.

Over time, Syscom 18 has installed and delivered more than 250 skids in Romania, Iran, Iraq, Bahrain, Algeria, Kazakhstan, Libya, Jordan. Mass or volume based, Syscom 18 has manufactured skids for all kind of oil products, for trucks, wagons or pipelines.

In order to deliver competitive and efficient systems, Syscom 18 also got MID approval and has invested in a new calibration facility; therefore the company today is able to complete tests and calibrations in its own factory. Syscom 18's specialists can engineer, manufacture, install and calibrate MID (Measurement Instruments Directive) certified metering skids for crude oil, heavy fuel oil, diesel, gasoline, LPG, kerosene, chemicals, volume and/or mass based. As a system integrator, Syscom 18 provides complete solutions for the custody transfer fiscal metering packages for oil and gas industries.

The oil price has plunged 60 per cent from last year's high of US$115 a barrel. This casual observation suggests that supply/demand factors specific to the petroleum market, especially supply ones, have played a key role in reducing the price during the fourth-quarter of 2014. Despite ongoing geopolitical risks - Russia, Ukraine, Libya and insurgent of 'so-called' Islamic States (ISIS) in Iraq and Syria - the price has collapsed. Hence, oil fundamentals (not fear factor) are currently driving the market.

The ending of bull-run for world energy markets?

THE FUTURES MARKET structure has shifted from 'backwardation' (a sign of tight physical supply) towards 'contango' shape (signalling rampant supply) – where spot price is below future delivery. Commercial users and money managers hedging in both Intercontinental Exchange (ICE) and New York Mercantile Exchange (NYMEX) also have continued to amplify the price drop. Such declines followed a period (2011-13) during which the global benchmark Brent fluctuated within a remarkably tight band of around US$110/barrel, which was also within OPEC's 'desired range'. In fact, 2011-13 had been one of the least volatile three-year periods of the recent history of petroleum market.

Concerns about slowdown in major energy consuming emerging economies (namely Brazil, Russia, India and China), where most consumption takes place, but also slack demand in the Eurozone and Japan, the US shale boom and a strong US dollar are cited as underlying reasons behind cheap oil – the International Energy Agency (IEA) refers to a "new chapter" in the history of oil markets. Global oil inventories may rise by a further 297mn barrels in the first half of 2015 – that could increase OECD-countries' stockpiles to 2.87bn barrels, equivalent to almost 60 days of consumption - the highest projected level on record - thus keeping downward pressure on oil prices.

A strengthening dollar, in which oil is priced, also hits demand since it makes crudes more costly for buyers holding other currencies. The dollar is likely to continue appreciating versus the Euro and Yen in the near-term, given the likelihood of further reduction of US monetary stimulus (ie, a gradual lifting of quantitative easing by the Federal Reserve Board) and a more lax stance by the European Central Bank and the Bank of Japan to revive sluggish growth.

At the time of writing, 2015 forecasts for global oil demand growth vary from the IEA (900,000 bpd); the Energy Information Administration (1mn bpd), and OPEC (1.15mn bpd). Last year, total demand grew on average by 600,000 bpd or only 0.6 per cent to 92.4mn bpd – mainly due to falling consumption in OECD regions. Whilst expectations for average crude price diverge from BP US$50, the World Bank US$53, the IMF US$56.7, EIA US$57.5, and CitiGroup US$62.5, Brent averaged just under US$100/barrel in 2014. The increase in oil futures volatility contributes to a highly uncertain forecasting environment. Cheaper oil has also impacted natural gas and fertiliser prices.

New supply equation

North America's production has soared in the past decade, as firmer prices have prompted increased use of innovative exploration techniques (including deep-water offshore drilling and shale liquids) and the implementation of new enhanced oil recovery (EOR) technologies to increase the output from existing wells. This has had a powerful impact on markets and is likely to reduce the call on OPEC's oil this year - expected at 29.8mn bpd, just shy of OPEC's current official target of 30mn bpd, according to Paris-based IEA.

The US oil production jumped by 1.45mn bpd in 2014, the largest growth among all non-OPEC producers and the largest in US history, to average 12.67mn bpd (including condensate), based on OPEC data. The US added a cumulative three million bpd to global supplies since 2009. Fereidun Fesharaki, chairman of Facts Global Energy, a consultancy, said: "We are entering a new world with plenty of hydrocarbons and a diversity of supply."

Weak prices may reduce investment in non-conventional technologies. The IEA expects investment in US shale drilling to drop by one-tenth over 2015, but supplies will remain ample thanks to recent gains in shale productivity. Citigroup commodities research notes: "We're going to start seeing some distress on the more marginal producers but the fact is you'll be cutting more marginal producers, less productive wells, you have a lot of inertia and aggregate US production growth doesn't look like it will slow down much."

Any sustained cutbacks in capital budgets bode ill for IOCs that are already struggling to replace depleting reserves as exploration becomes harder and new discoveries smaller.

Projections for 2015 world oil demand vary from 880,000 bpd to 1.13mn bpd.

Echoing the above remarks, Goldman Sachs said: "We have greater confidence in the scale and sustainability of US shale oil production. This implies that the global cost curve has shifted lower and that cost deflation is sustainable. Accelerating non-OPEC production growth outside North America will outpace demand growth, leaving the global oil market oversupplied. If US production were taken out of the mix, oil prices would be around US$150 to US$170/barrel."

Price war?

Being low-cost producers and with sizeable foreign assets, Saudi Arabia and close Gulf allies within OPEC can withstand dwindling revenues far better than 'highly leveraged' producers like Russia, Venezuela, Iran and Nigeria. Saudis would rather keep prices at mid-US$50-60 range to stifle US shale producers, who threaten its status as No 1 oil producer. Saudi Arabia (OPEC Kingpin) has historically acted as a swing producer by adjusting output to keep prices stable.

Once deemed a 'fair' price by Arab core producers, US$100/barrel crude has spurred [non-OPEC] production boom – led by shale and tar sands drillers. The former believe that once the breakneck growth of high-cost producers patch slows and cheaper fuel stimulates demand, oil prices could find a new equilibrium – even without any production cuts by OPEC. London-based Saxo Bank, remarked: "The Saudis have deeper pockets than shale producers."

For high-cost producers, prices have now reached a level where exploration and development (E&D) costs are deemed economically unviable. "The best that all the other world producers from Russia through Canada, the US, Mexico, Latin America, Africa and the rest of OPEC can hope for is that by mid-2015, enough oil has come off the market. And combined with a pick-up in demand, that the equation looks a bit better," said Paris-based energy watchdog, IEA.


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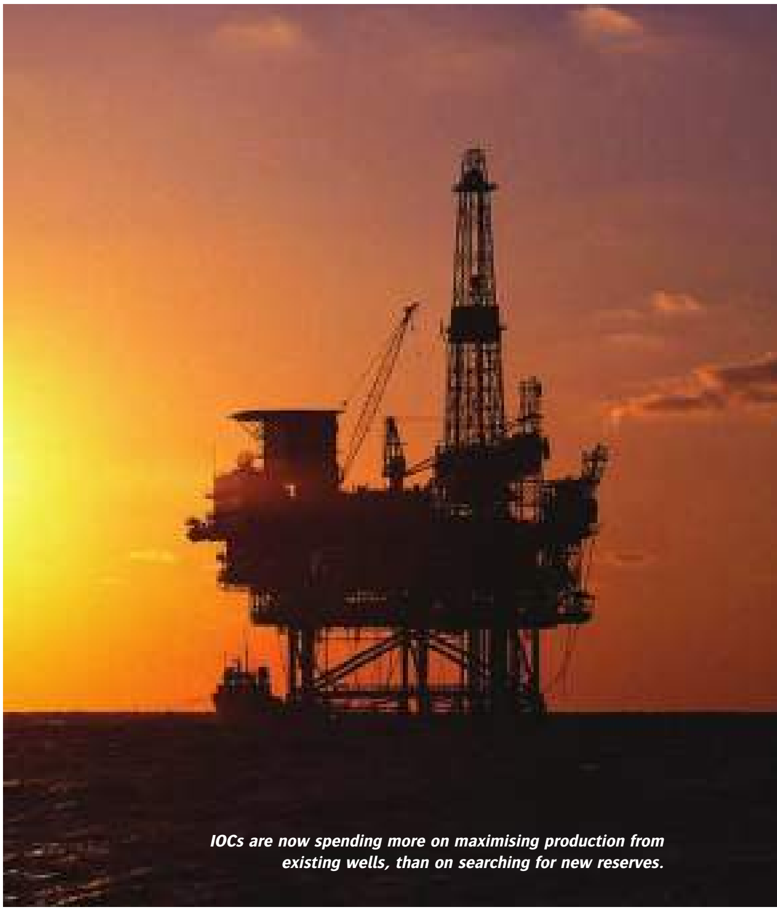
Long-term projects on-hold

Contrary to higher capital expenditure (capex) seen in the upstream sector during the past three years, reaching an estimated US$710bn in 2013, according to IEA, sustained cheap oil will prompt energy companies to slash investments in new projects as firms try to keep cash-flow positive and their debt in check. Wood Mackenzie, energy consultants expect the top 40 international oil companies (IOCs) to collectively cut capex by US$170bn or 37 per cent to keep net debt flat if global prices remain at US$60/barrel. That would be in addition to US$9bn of cuts announced in recent weeks by IOCs. In total, there are about US$127bn of global industry greenfield projects at risk of deferment, Wood Mackenzie said.

In 2015, IOCs are expected to make final investment decisions (FIDs) on a total of 800 oil and gas projects worth US$500bn and totalling nearly 60bn barrels of oil equivalent. But around one-third of the spending, or a fifth of the volume, is unlikely to be approved. At US$70/barrel, half of the overall volumes are at risk, according to Norwegian consultancy Rystad Energy. Around one-third of the projects scheduled for FIDs in 2015 are unconventional, where oil/gas are extracted using expensive horizontal drilling, in what is known as fracking. Any sustained cutbacks in capital budgets bode ill for IOCs that are already struggling to replace depleting reserves as exploration becomes harder and new discoveries smaller. That could prompt tighter supplies by the end of the decade.

Schlumberger Ltd, the world's largest oilfield services company, however, reckons capex would rise as global consumption is poised to increase, downplaying fears of an investment slowdown due to bearish sentiment. "The key to the overall market is that global oil demand is currently set to increase by 1.1mn bpd in 2015, which will require growth in exploration and production investments," explained Schlumberger CEO, Paal Kibsgaard.

Baker Hughes Inc, the world's No 3 oilfield services provider, also thinks shale drilling activity is unlikely to abate unless crude remained below US$75 for a longer period. Still, Schlumberger estimates exploration spending in 2014 fell four to five per cent from a year ago, largely due to a 20 per cent drop in seismic expenditure. IOCs are now spending more on maximising production from existing wells, than on searching for new reserves – partly because of growing investor pressures for higher shareholder returns.



IOCs are now spending more on maximising production from existing wells, than on searching for new reserves.

The key to the overall market is that global oil demand is currently set to increase by 1.1mn bpd in 2015, which will require growth in exploration and production investments.

Future trends

Collapsing prices tend to be 'self-correcting' over the long run, but a return to previous highs appears unlikely. Saudi oil minister Ali al-Naimi was blunt when asked if the world would ever again see triple-digit oil prices, "We may not."

Real prices will probably fall, reflecting looming supplies of unconventional crudes, further substitution between oil and natural gas and efficiency improvements in vehicle transport induced by US$100-plus prices over 2011-2013, as well as a switch to hybrid, gas and electrically powered transport vehicles.

Oil-intensity (ie, the quantity of energy required per unit output) has steadily declined in both developed and emerging markets so the 'correction' between cheap fuel and consumption growth is no longer that strong - like in the seventies and eighties. In advanced economies, a switch to more efficient vehicles is slowing demand. On average, automobiles sold in the US during August 2014 could travel 41.5 km on a gallon of fuel, up 28 per cent since 2007, according to the University of Michigan's Transportation Research Institute.

The world's most traded commodity - falling further than fundamentals justify - could partially recover in the second half or early 2016 as investment and future capacity growth in the industry respond to lower prices. If oil drops below the US$40 level in the near term, Saudi Arabia, OPEC's kingpin, may have to sanction production cuts to the relief of African producers. ■

MOIN SIDDIQI, economist

Is it possible for African countries to harness the economic opportunities that their natural resources provide for their own long-term advantage? This question is central to the thinking of the corporate boardrooms of companies operating in Africa and governments alike. Helping to ascertain the answer is a new advisory company, Kina Advisory Ltd, headed by Rosalind Kainyah who spoke to Oil Review Africa's contributing editor Stephen Williams.

Socio-economic investment

THERE CAN BE few people in the extractive industries sector that have as much experience in handling socio-economic issues as Rosalind Kainyah. After reading for a degree in English in Ghana, she went on to study law in London, UK, and was called to the English Bar. She started her career in the extractive industries sector as an environmental lawyer at Anglo American South Africa and then joined the law firm Linklaters as an environmental and corporate lawyer. She went on to De Beers, working within that company for seven years, the final two years setting up and running its US office, and after that to Tullow Oil, the Africa-focused hydrocarbons exploration company.

Conflict of interest?

We began our conversation with a question over whether she ever felt a conflict of interest working with those multinationals with a presence in Africa? After all, multinationals usually have as a priority their responsibility to shareholders. Indeed, it's a legal requirement. How did this square with the very obvious passion that Kainyah has for Africa?

"I have actually found myself in privileged and influential positions within some of the great companies I have worked for," she said. "I understand how those companies operate and what they need to achieve. I also do see very clearly that it has to be a partnership between the companies and their host countries, and appreciate the interests of both sides.

"Yes, there have been times when I have felt frustrated, thinking 'if both of you could just agree on this one point without being so suspicious of each other, it would be move things on because it is actually of benefit to both of you'. But no, I've never felt torn, I've never felt I'm siding with one against the other."

Her last corporate position was with Tullow Oil. After meeting with Aidan Heavey, the company CEO and other executive directors, she was invited to join the company. "They wanted to set up an external affairs department and extend their corporate social responsibility mandate," she explained, "and I was given the opportunity to set up Tullow's first External Affairs & CSR department which I ran for four and half years.

My experiences in Anglo, De Beers and Tullow have made me realise that there is still a large space between what companies want to achieve and what countries need to achieve, and it is that space that I want the new advisory company, Kina, to occupy – bringing the two sides together."

Rosalind Kainyah, head of Kina Advisory Ltd, which is currently focused on corporates, both international and African.

In fact, Kainyah is not that keen on the term 'social responsibility' as, she says, people automatically think 'philanthropy'. She prefers 'socio-economic investment', and she sees that as one of the tools that a company can use to both achieve its core business objectives as well as benefit host countries. "There is absolutely nothing wrong with such enlightened self-interest. At the end of the day, it is a very effective means of ensuring a sustainable business as well as sustainable benefits to the full range of a company's stakeholders – from shareholders through to impacted communities.

A good example of intelligent and business-focused social investments are initiatives that foster local content and build local capacity, so that more local businesses can be part of the supply chain, and more local people can be employees of an international company."

There is certainly evidence that this sort of thinking was behind Tullow Oil's strategy in Africa over recent years. The company has a reputation for taking a progressive attitude in its relations with local governments and the communities in which it operates.

> There is still a large space between what companies want to achieve and what countries need to achieve.

"This leads to more cost-efficient operations for companies and helps to deepen and broaden economic empowerment among citizens in host countries," Kainyah explained.

"International companies may need to invest in building up skills within and capability of local companies so that they can become part of their supply chain or otherwise participate in the industry. For example, a company can support a tertiary institution so that it produces more and better qualified vocational technicians.

"The company does not necessarily envisage employing all of the technicians these institutions will train, but it is helping to create a pool within the country that it and others can dip into for employees. And, perhaps even more importantly, creating capabilities so that technicians can set themselves up in business and supply their services to these companies and others, and themselves create jobs."

The media often criticises the multinational extractive industries that set up operations in Africa, accusing them – be they oil companies or miners – of exploiting Africa's resources.

When this was put to Kainyah, she said, "I think that perspective on the extractive industries in

Tullow's long-term approach is nationalisation - here they are going over safety rules, which were designed to help manage high risk activities.

Africa is improving because more companies are actually understanding the bigger picture. There are still some companies who might say 'we are just here to mine, or just here to explore for and produce oil, and it is not our business to get involved in anything else beyond that'. But I offer this challenge to those companies: even if you are being ruthlessly commercial, thinking only of returning profits to shareholders or repaying capital to the banks, you have to make sure that the environment in which you are operating enables you to get on with your business and to be the most profitable you can be.

"I believe there is a clever way of making socio-economic investments a win-win strategy. For example, you may be in a country with inadequate infrastructure for your business purposes – infrastructure that would otherwise be provided by government – say roads, power, etc. You will need to build or otherwise provide that infrastructure to get on with your business anyway. I would suggest that you do this in a way that serves both your operations as well as the community around your operations – or even for the broader common good."

It's not just the corporates that come in for criticism – so too do governments and their ability to negotiate with the extractive industries to achieve a fair return for their resources. This has been one of the issues taken up by Professor Paul Collier of the Centre of African Economics at Oxford University.

As Collier writes in his 2010 book, The Plundered Planet, there can be an asymmetry in the ability for a government to arrive at a mutually beneficial outcome when striking extraction deals. Corporates often have far better information and legal firepower than a nation state.

But Kainyah said: "I think there is a responsibility on African governments to build up the capability and capacity necessary to negotiate good and fair (for their citizens) deals with international companies.

"They could always bring in the expertise to help. I would be more than willing to advise an African government. I have not yet had that opportunity and because I'm very much of the corporate frame of mind, it may be more appropriate for me to advise state-owned enterprises, which are generally within the space between a corporate and government institution – for example, a national oil company or national power company."

For the moment, however, Kainyah's company, Kina Advisory, which she founded in October 2013, is focused on corporates, both international and African. She continues to work with Tullow Oil, and has also begun working with Mitsui, the giant Japanese corporation that has oil and gas interests in Ghana and Mozambique.

"I gave it the name Kina, which means depth in Kiswahili. As a pan-African socio-economic advisory firm, our objective is to deepen economic empowerment. We identify socio-economic tools to help international companies mitigate the risk and leverage opportunities, of doing business, and support local African companies on building up their capabilities and their social, governance, and human resource development standards so that they can become part of the value chains of international companies.

I believe there is a clever way of making socio-economic investments a win-win strategy.

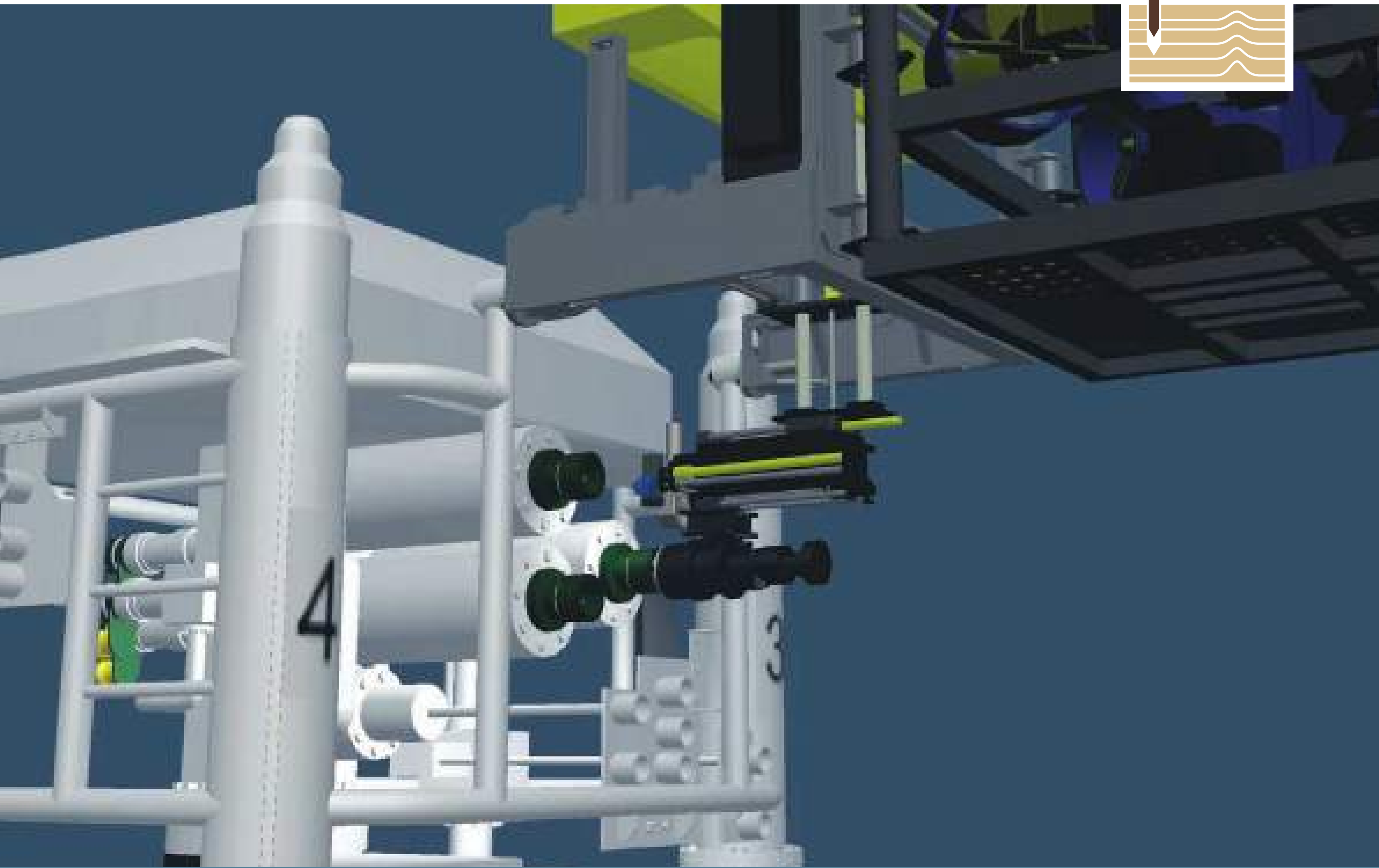
"As difficult as it is to talk about an 'African way' of doing business, I think there is a very special thrill about doing business on the continent – and it can be very rewarding." ■

Training initiative from BW Offshore and Seagull

BUILDING ON A training relationship stretching back almost two decades, BW Offshore and Seagull are developing new training material to cover BW Offshore's process and production operations.

"BW Offshore has an ambition to always be at the forefront when it comes to training of our offshore crew," said Dagfinn Hatleskog, BW Offshore senior VP oceanic fleet. "We have worked with Seagull for many years on the maritime part of our operations, and we are delighted to see that Seagull now also focuses on production and process related topics. Seagull and BW Offshore share the idea that training is most effective offshore using real equipment, where the crews are already on duty."

"This is a great opportunity for Seagull Oil & Gas," said Morten Aasen, Seagull's managing director. "We are building a comprehensive e-learning library based on the educational material developed by the Norwegian Petroleum Academy, and by partnering with industry leaders like BW Offshore we aim to offer exactly what the industry needs."



03

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The general investment climate in Nigeria is crumbling, amid the unchecked violent Islamist Boko Haram insurgency, the government lacking energy to push through badly needed reform and the global oil price fall. For the oil and gas industry in particular, the regulatory stalemate continues to kill off large-scale projects. Nevertheless, at a closer look, the small-scale mature development projects look like they will continue largely unabated, at least for some time longer.

Tougher times await Nigeria's oil and gas industry

Nigeria might soon become a shrinking play, but with a newfound robustness at its mature onshore/shallow water acreage, from which larger players often already have withdrawn. Image: Maritime Security Services in Nigeria

Majors' withdrawal from mature onshore plays in rapid decline has opened an entry point for minnows and juniors to take on brownfield projects.

NIGERIA'S WOES CONTINUE and are in fact gathering pace. The government's effort to defeat the extremist Boko Haram movement have faltered and an increasing area in the country's northeast has slipped outside of government control.

Meanwhile, the oil price rout means that government funding will become strained in 2015 while the upcoming presidential elections mean it will be hard for the government to tighten the fiscal belts sufficiently.

Expectations are building for a hotly contested electoral race, with a close and unpredictable outcome, something which could well be a recipe for renewed domestic political and ethnic tensions – possibly even violence. Threats from the ever restive Delta region have suggested that a loss for incumbent, President Goodluck Jonathan, could lead to renewed rebellion there. A loss for main challenger, retired general Muhammadu Buhari, behind whom a large opposition coalition has managed to unite, would on the other hand most certainly at least stoke severe tensions in the north and northeast. With Boko Haram on the march, both developments could on their own be enough to fundamentally worsen the country's overall security situation.

Meanwhile, the government is looking increasingly like it is lacking the force and initiative to drive, and push through, reform. With the budget bound to take a very large hit from the fall in oil prices, the government is unlikely to start building momentum this year.

PIB still in limbo

While the security and fiscal situation would call for a focussing of minds, that remains unlikely during an election year. The Petroleum Investment Bill (PIB), which for years has been expected to become the next governing framework for the oil and gas industry continues to be stalled in a limbo between government and parliament.

Oil minister Diezani Alison-Madueke has repeatedly laid the blame for the delay on parliament, but also said, late December, that the government was not considering any revisions to the raised government take suggested by the current PIB iteration. Given the oil price plunge, the Parliament's unwillingness to pass the PIB, amid widespread fears it will indeed perpetuate the fall in upstream investment of recent years, is likely to continue.

Indeed, many would agree the government has more pressing things to do than to work on industry sector reform and taxation, as security in large parts of the country crumbles and an increasing part of the population fall under Boko Haram's actual control.

Add to that this year's escalation of oil theft from criminal gangs in the southeast and the government's temptation to pursue a military-only anti-insurgency strategy might start to look understandable. So far the strategy has failed however and the lack of policies addressing the underlying causes to Nigeria's security problems has only left the government and now increasingly the country's military, looking weak.

Oil companies are left with a dire calculation. If the PIB is passed in the coming years, government take would rise from around 61 per cent to 73 per cent. Oil companies have declared such a level as completely unrealistic, turning all deepwater production uneconomical.

Whether that is true could of course be debated, however, it would most likely end investment in new deepwater projects, which is what has happened over the past years anyway, given the almost complete fiscal uncertainty facing companies.

This is a grave development, since Nigeria's mature onshore has been in deep decline for years and its shallow water/delta offshore production has reached maturity too. Nigeria's oil production has stagnated around 1.7-1.9mn bpd in the past three years and, given the lack of investment in large deepwater exploration and development, decline will follow.

With the clouds gathering around the country's security and overall stability in 2015, companies are even more unlikely to reconsider their scepticism, particularly in an environment when capex budgets are slashed as a response to the dramatic oil price fall.

Opening for minnows and juniors

But there has been another story to Nigeria's oil and gas industry in recent years and this story continues, at least for now. Majors' withdrawal from mature onshore plays in rapid decline has opened an entry point for minnows and juniors to take on brownfield projects and develop EOR techniques, as well as small satellite deposits which once were deemed too small to interest large companies. This process goes on and has not lost speed throughout the second half of 2014, despite the fall in oil prices.

Naturally, lower oil prices will affect investment levels, particularly when raising enough debt with diminished reserve valuations as collateral becomes a problem. This is likely to happen gradually from the onset of the new year, nevertheless, many projects were launched in the past two-three years and are yet to bear fruition with funding already being in place.

As there has been a move down the scale regarding the size of upstream actors in Nigeria's onshore, the same has to a large extent been happening in the service and oil technology industry, creating openings for smaller, often indigenous, players.

Newfound robustness

This is good for the industry, giving it another kind of vitality and staying power, particularly when the country's overall oil output moves into mature decline on a larger scale in the coming two-three years. Hence, Nigeria might soon become a shrinking play, but with a newfound robustness at its mature onshore/shallow water acreage, from which larger players often have already withdrawn.

With that in mind, much of the resulting capacity cutting in the service industry is likely to be made by the larger players, who have already started, or are finalising plans, to lower their Nigerian exposure.

Small actors in this field might therefore find themselves identifying growth opportunities despite the overall narrative of decline during the coming five year period.

All in all, the Nigerian story seems about to take a turn for the worse, with a military-only strategy against the Boko Haram insurgency looking lagely deflated at the start of 2015 and during the coming year likely to fall between the hammer of deep financial constraint and the anvil of increased political tension and spreading restiveness. There will be no political energy and momentum left to deal with issues of fiscal and economic reform.

A silver lining remains

One silver lining remains, however, in the dire macroeconomic picture. Low oil prices mean that the country's otherwise expensive and draining fuel subsidy system will cost much less, or even nothing, effectively freeing up funds to fill developing budgetary holes elsewhere. Those funds will be a good help in tying the economy over this year and keeping deeper unrest at bay. ■

Crude oil decline threatens three Nigerian deepwater projects

DR JOSEPH DAWHA, group managing director Nigerian National Petroleum Company (NNPC), has said that the ongoing decline in crude oil price will delay the exploration of three national deep water projects.

Dawha made the revelation at the seminar by the Offshore West African Conference in Lagos with the theme `Managing West Africa's Major Projects'.

Dawha, represented by Jonathan Okehs, group general manager, National Petroleum Investment Management Services (NAPIMS), said that the theme was chosen to address the decline in oil projects in West African countries and seek solutions. According to him, many companies have cash flow challenges due to the crude oil price decline that affected their capital expenditure.

"Delay in major projects will now be featuring in many companies' projects and progammes, especially for offshore projects, as companies try to balance cash flow for projects,'' he said.

According to him, the challenges of the Nigerian oil industry revolve around managing major projects through both price and physical uncertainty.

The Egina oil project is a key project for Total in Nigeria and takes technology and skill transfers to a new level, giving Nigeria the full benefit of Total's deep offshore experience and expertise. In 2017, the Egina oil project elements, costing US$3.5bn built in Nigeria, will be incorporated onto the Egina FPSO. Odimegwu Onwumere reports.

Egina - taking technology and skill transfers to a new level

12 *DECEMBER MARKED* a milestone for the Egina project in Nigeria, as Total launched an intensive drilling programme. The firm will be keeping two rigs working away for a total of 3,000 days, drilling 44 wells. The wells being drilled by Total are in water depths ranging from 1,400 to 1,700 metres.

"This is the deepest offshore project ever operated by Total," commented Jean-Michel Guy, executive GM of the Egina Project. "With production of 200,000 bpd, it will contribute significantly to achieving Total's 2017 production objectives."

Total included a significant amount of local content into the Egina development, with several thousand local jobs being created. Extensive local infrastructure (mainly yards) will be upgraded or built.

The Egina field was initially planned to be developed as a subsea tieback to the Akpo FPSO, however major discoveries made led to the company changing it to a stand-alone development.

Production is scheduled for around the end of 2017.

The Egina project takes technology and skill transfers to a new level, giving Nigeria the full benefit of Total's deep offshore experience and expertise.

Total is operator on the Egina field located in deepwater Oil Mining Lease (OML) 130. Deep offshore development is one of the sectors strategic to the country's future growth. The project currently under development will have a production capacity of 200,000 bpd.

- Total's interest: 24 per cent
- Partners: CNOOC (45 per cent), Petrobras (16 per cent) and Sapetro (15 per cent)

At the end of 2017, the start-up of the Egina development will reinforce Nigeria's deepwater production potential.

The development of this oil field, located 130 km from shore in a water depth of 1,750 m, will benefit from Total's extensive deep offshore experience in the Gulf of Guinea. The field infrastructure consists of a subsea production system tied in to a Floating Production Storage and Offloading (FPSO) vessel with a processing capacity of 200,000 bpd and a storage capacity of 23mn barrels.

The chairman of Lagos Offshore Logistics Base Limited, LADOL, one of the contenders in the project, Chief Oladipo Jadasimi has said that his company has faith in the development of Nigeria's economy, while commending President Goodluck Jonathan for the course of the Nigerian Content

Egina has overcome challenges with the LADOL initiative and created a landmark for the oil and gas industry in Nigeria.

Production is scheduled for around the end of 2017.

Act. The managing director of Nigeria Export Processing Zone, Mr Gbenga Kuye, illustrated that the project is a first-class bond for a local company to co-work with a foreign company largely for the progress of the Nigerian economy.

Background

Back in May 2013, Saipem was awarded the contract for the subsea development of the Egina field, in a water depth up to 1,700 metres. According to a press release the following month: "Saipem signed with Total Upstream Nigeria Ltd an EPCI contract for the subsea development of the Egina field, located in the Oil Mining Lease 130, approximately 100 km off the Nigerian coast south of Port Harcourt in the Rivers State."

The scope of work, according to the source, includes engineering, procurement, fabrication, installation and pre-commissioning of 52 km of oil production and water injection flow lines, 12 flexible jumpers, 20 km of gas export pipelines, 80 km of umbilicals, and of the mooring and offloading systems. The marine activities will be performed throughout 2016, continuing to the second quarter of 2017.

Investigation, however, revealed that before the contract was awarded to Saipem, there was hard-hitting competition.

A source said, "Saipem with its huge Rumuolumeni Yard in Port Harcourt, Rivers State, is a prime contender for the US$1.4bn Surf order (it also secured the Surf packages for both the Usan and Akpo fields also operated by Total). However, other contenders include Technip, the new Acergy-Subsea 7, and two Nigerian players, West African Ventures, WAV, and Nestoil."

In June 2012, the Federal Government of Nigeria insisted on transparency in Total's Egina project in their plans to sign the contract by the end of 2012, and to begin production from 2015. As a result, the development of this deep water project was delayed for two years.

Reasons behind the delay

According to the Ag Energy editor, Daily Independent, Mr Anayo Korie, part of the delay included a legal battle between Samsung and Ladol over Samsung's intention to dump the firm for another local contractor for the fabrication of the vessel for the project. Samsung's action was to integrate the vessel and other components outside the shores of the country. This was rejected by the National Content Development Monitoring Board (NCDMB), and the friction and backlash cost the early retirement of one of the top managers of NNPC who recommended the award of the contract to Samsung. This was despite rejection by National Petroleum and Investment Management Services (NAPIMS), and Department of Petroleum Resources (DPR), who formed part of the impediments, which were resolved by the Nigerian government owing to the importance of the project that made it see the light of the day.

Further investigation revealed that the project was a hot contest between Samsung and Hyundai, both from South Korea. The NAPIMS and DPR were opposed to the award of the contract to Samsung and LADOL due to lack of facilities for the development of an FPSO, one of the vital vessels to be used for the development of this US$15bn www.ng.sgs.com

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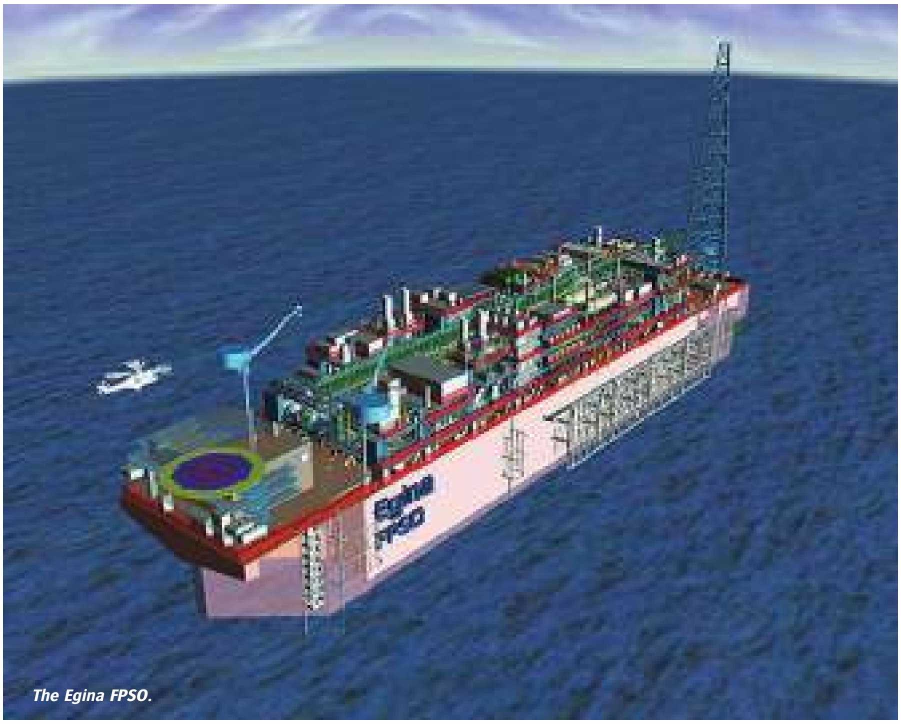

The Egina FPSO.

project. But the Federal Government insisted in the award of the contract to Samsung and LADOL, as the local content driver, based on the advice of top NNPC staff who has now retired.

After winning the contract, Samsung decided to dump LADOL for another firm. This made the management of LADOL drag Samsung to court for breach of contract. The case lasted for two years before the Government intervened, forcing the contending parties to withdraw the case for settlement out of court, for national interest.

Egina project well on the way

At a ground breaking ceremony held in Lagos to signal commencement of the construction of the SHIN and LADOL yard where integration of the Egina FPSO is expected to take place, the managing director of Total Upstream Nigeria Ltd (TUPNI), Elisabeth Proust said that with all the rigours, the Egina project had accomplished approximately 20 per cent of the anticipated works.

This landmark was co-celebrated when the drilling rig, West Jupiter, left South Korea for Nigeria in November to start drilling by December 2014, against the heralded 2015.

Proust further said, "Total is fully committed to achieving the Nigerian Content Sustainability Target by ensuring teamwork between the international oil companies and local contractors. The main objective is to foster technology transfer, knowledge sharing and local skills development. As the first major project to be started under the Nigerian Content Act of 2010, Egina has overcome challenges with the LADOL initiative and created a landmark for the oil and gas industry in Nigeria."

"Egina is a key project for Total in Nigeria and a strong partnership with the Nigerian government, other international companies (IOCs) and local contractors. Projects such as Egina empower Total to further demonstrate our true commitment to the Nigerian economy and its people," Proust added. She said in furtherance of the Nigerian Content Development policy and with the project's detailed engineering being carried out in Nigeria, Total had ensured that Samsung Heavy Industries and other main Engineering, Procurement and Construction (EPC) contractors were contributing to the development and growth of other Nigerian yards such as Aveon, SCNL, Pipe Coaters Nigeria Limited (PCNL), EWT/Nestoil in Port Harcourt area and Nigerdock, and Dorman Long in Lagos.

A future hub for deepwater assets

Frank Ejizu, general manger of Samsung Nigeria, who also spoke at the ceremony, said that the Lagos Deep Offshore Logistics Base (LADOL) was chosen for the project because of its location, adding that it suits Samsung's vision of making the facility a hub for deep water assets development in Africa.

He explained that Samsung will provide 70 per cent of the US$300mn required to develop the facility while LADOL will account for the remaining 30 per cent.

He admitted that one of the key local content components of the contract was the fabrication of some topside modules and hull appurtenances and integration of those products into the FPSO in Nigeria.

"This is where MCI, a subsidiary of Lagos Deep Offshore Logistics comes in. LADOL is our partner in the SHI-MCI FZE, the joint venture company," he said.

He explained that some of the key components of the Egina FPSO contract would be handled by Nigerian contractors such as Dorman Long, Aveon Offshore, Nigerdock, Delta Afric, NETCO, IESL, among others; all working on the project as subcontractors to Samsung.

Egina has overcome challenges with the LADOL initiative and created a landmark for the oil and gas industry in Nigeria.

The drilling rig, West Jupiter, left South Korea for Nigeria in November and started drilling in December 2014.

Fabrication facility first of its kind in Africa

According to the managing director of Samsung Nigeria, Chamwang Kim, "The fabrication facility, which is the first of its kind in Africa, is expected to make Nigeria the hub for the fabrication of facilities urgently needed to harness deep water hydrocarbon assets in sub-Saharan Africa. Samsung has complied with the law and the safety code of Nigeria in the development of the facility."

The group general manager of NAPIMS, Jonathan Okehs observed, "The development of the SHI MCE FZE yard, a joint venture company between LADOL and Samsung, came into existence for the development of the Egina deep water project."

According to him, the project, which is set to hire over 1,500 welders, will also create over 50,000 jobs through direct and indirect jobs, noting that the fabrication yard has the capacity for marine rigs, vessels and other onshore vessels urgently needed for the development of Nigerian economy.

He was optimistic that the project will be completed within 18 months.

Earlier this month Total unveiled a programme of operation for the project. Describing it as the deepest offshore project ever operated by Total, executive general manager of the project, Jean-Michel Guy explained that with production of 200,000 bpd, the project would significiantly contribute towards actualising the firm's total production target for 2017.

Guy further stated that the Egina project emphasised Nigerian content as several local jobs would be created thereby contributing to the nation's sustainable development.

A win-win situation

He described the Egina project as a win-win situation that would enable the company to pursue a partnership that began more than 50 years ago. He stated that the Egina project, which received a positive investment decision in 2013, was expected to begin production at the end of 2017.

The project will include an FPSO unit, an oil off loading terminal and subsea production systems such as risers, 52km of oil and water injection flowlines, 12 flexible jumbers, 20 km of gas export pipelines, 80 km of umbilicals and subsea manifolds.

TUPNI has a 24 per cent interest alongside the OML 130 partners: NNPC (Nigerian National Petroleum Corporation), SAPETRO (South Atlantic Petroleum) of Nigeria, CNOOC Ltd (China National Offshore Oil Corporation) and Petrobras of Brazil. When completed Egina will add 200,000 boe to Nigeria's production. ■

Petan raises bar for Nigeria's O&G industry

THE PETROLEUM TECHNOLOGY Association of Nigeria (PETAN) has expressed optimism for growing participation of indigenous players in a progressive oil and gas industry in the years ahead.

The chairman of PETAN, Emeka Ene, who disclosed this recently, said Nigeria's oil servicing sub-sector is maturing, which is an indication that the local content initiative has come to stay. Stating that more independent local operators are springing up to hold ace in the sector this year, he emphasised the need to grow capacity and optimal utilisation of local expertise.

He applauded the Federal Government for its unwavering commitment to growing local participation in the sector.

"There are certain things that could position Nigeria as a strong country over the next 20 to 30 years; the first is local content and the gas master plan which will create a basis for a real gas market and privatising power will strengthen Nigeria's economy. The PIB will also create long time investment in the country."

Ene, however, saw opportunities in the dwindling crude oil prices in the international market rather than entertaining fears, urging the indigenous operators to look inwards and exploit the opportunities therein.

"You have to understand that Nigeria's oil today is not as cheap as it was 15 years ago. The reality today is that the cost of production of Nigerian oil is within US$20 to US$30 per barrel. The circle of ups and down is a good thing, it allows efficiency to be built and allows companies to re-strategise on how to deliver service quicker better and faster.

"I think to a large extent the opportunity that Nigerian companies had should be increased because all firms now want to get better value. We reckon that Nigerian content and Nigerian companies will actually get busier with the support of the regulators and policy makers," he said.

Cost management key to Seplat's success

"WE KEEP OUR eyes on cost," said Dr ABC Orjiako, chairman and founder of Seplat Petroleum Development Company – the biggest African oil and gas concern to have ever listed on the London Stock Exchange – in a recent interview with the World Oil Council. Mr Orjiako believes the company's success has stemmed from its ability to keep costs down.

Seplat raised US$500mn through an initial public offering, giving it a market value of US$1.9bn. It listed in April 2014.

In the interview, Orjiako revealed that Seplat was able to remain profitable with a break-even point of only US$30 a barrel. As a result, many multinational oil companies based in the West have begun to take a real interest in the company's business model.

"First of all, in our choice of acquisitions we don't overpay. We say that the acquisitions we do are very price-dependent. We keep our eyes on oil prices, knowing that oil prices go up and down, therefore we pitch our operations on profitability, making sure our operations are very cost-controlled and disciplined. In doing that, we make sure that our break-even point for production is way below where the oil prices are going."

Orjiako said because of ongoing problems with theft and corruption in the Niger Delta, onshore prices could be as low as US$10 a barrel. However, because Seplat was in a growth phase, a lot of aggressive investments were being made, which is why the company's break-even was in the 30s.

"What that means for us as a company is that when the oil price is falling we still remain profitable. However, that doesn't mean that overall revenue will continue to be as high as expected.

"But one of the strong mitigations we have is our gas development. In gas we saw it way ahead of time. Given the gas revolution programmes in Nigeria, we immediately made it clear that we would develop gas to support the reform agenda in the administration – gas to power, gas to industrial and gas to agriculture. When you do this, you find with the increasing demand for gas in Nigeria you fetch higher prices."

Nigeria renews Chevron's offshore licences

NIGERIAN AUTHORITIES HAVE finally approved Chevron's eight-year-old request for renewal of licences for Chevron operated Oil Mining Leases (OMLs) 83, 85, 88, 89, 90, 91 and 95, for a term of 20 years.

The earlier, 40-year licences expired in December 2008. Chevron has battled to have these acreages renewed since 2006.

Two immediate implications of this are that (1) one factor delaying the sanction of the Agura Independent Power Plant project has been removed. Chevron operates and holds a 40 per cent interest in this IPP (Phase 1: 330MW). The company declares in its factsheet: "A final investment decision is pending conclusion of commercial agreements and renewal of offshore leases". (2), the purchase of Chevron's 40 per cent equity in OMLs 83 and 85 by the Nigerian independent First E&P, can now go forward.

Chevron is the third largest oil producer in Nigeria (after Shell and ExxonMobil), with average net daily production of 233,000 barrels of crude oil, 182mn cfg and 5,000 barrels of liquefied petroleum gas in 2013. These seven, just renewed acreages, are

among the 12 (including OMLs 49, 51, 52, 53 and 55) that the company operates in a 40:60 Joint Venture with the Nigerian National Petroleum Corporation (NNPC), the state hydrocarbon company.

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Guaranteed communications security, with speedy dispatch of life-saving air transport you can count on for ill or injured staff.

Over-optimistic borrowing and spiralling state spending has made Ghana financially fragile at a time of falling commodity prices. Although state expectations on the development pace of oil and gas projects have been unrealistic, the country remains a promising growth spot in a West Africa which elsewhere largely fails to enthuse investors.

Good things could come to those who wait in Ghana

GHANA IS A recent newcomer to the group of African oil exporters, but officially has its sights on a 500,000 bpd production in about a decade's time.

That is roughly five times this year's average oil production in the West African country and a number which the oil industry and financial industry increasingly takes with a pinch of salt. This is particularly so given the dramatic fall in oil prices during the second half of last year.

Ghanaian oil potential entered the global mind with a bang a few years ago, following the discovery of its Jubilee field by Tullow Oil. Although this large offshore find sparked a widespread search for offshore oil in many other West African nations –and although other finds were made - it seems official hopes have exceeded actual results throughout the Ghanaian exploration and development process so far.

Ghana entered on a spending spree with its expected future earnings, pushing its external debt ratio up again, after most of it being written off in a 2005 international debt relief deal.

The result today, after a year with falling cocoa, gold and oil prices, is a state struggling with a budget deficit close to 10 per cent of GDP, a currency which has plunged almost 40 per cent in value and an inflation rate at about 15 per cent. Reforms will be hard to implement, as about 70 per cent of the budget's tax income goes to salaries of state employees, meaning that spending reductions rapidly will translate into rising unemployment.

A more business-friendly focus?

That might be a dire backdrop, but it might also raise the chances for Ghana's political establishment to focus its mind on maintaining – and improving – its investor climate, particularly towards the developing oil and gas industries.

Ghana's dependence on commodities will only grow and cannot be wished away in the medium-to-long term. Indeed, oil and gas is by now the only near-certain large-scale growth industry in the country, although the softness in both gold and cocoa prices naturally might pass at some point and improve the outlooks for the mining and agricultural sectors.

While countries to the west of Ghana saw exploration – and in some cases discoveries - being made later, Ghana already has three projects lined up for development, hoping this will become four projects early this year. That is of fundamental importance following the plunge in oil prices from US$115 per barrel in mid-2014 to the low US$50s per barrel which Brent traded for at the start of 2015.

Ghana already has three projects lined up for development.

Ghana already has three projects lined up for development, hoping this will become four projects early this year.

The Atuabo gas processing plant is about to start treating the first gas production from Jubilee.

Stena Drillmax has drilled all Hess's discoveries in Ghana

In the last quarter of 2014 oil companies already started presenting sizeable cuts to their 2015 capex budgets. Oil projects carrying a higher relative production cost, like, for instance, deepwater projects, naturally felt the brunt of early cuts being made, together with Canadian oil shale developments and Arctic projects – something likely to become a trend during 2015.

Limited but relatively certain growth

A prolonged oil price weakness is therefore almost certain to significantly delay the Ghanaian government's projection of a 500,000 bpd production capacity in a decade's time; however, a doubling of oil production from 110,000 bpd at end-2014 by 2017-2018 remains realistic, given the projects which have been launched.

The Tullow-operated Jubilee field is targeting a 120,000 bpd plateau rate in 2015, while by 2017 the company's TEN (Tweneboa-Enyenra-Ntomme) fields should have reached an 80,000 bpd production rate. Meanwhile, Eni is developing the Sankofa-Gye Nyame project, which that same year is expected to add another 50,000 bpd of oil and 170 mmcfd of gas. Large hopes are also placed on the Hess-operated exploration in the Deepwater Tano/Cape Three Points block, where several discoveries have been reported and results from a three-well appraisal and well-test programme carried out last year are expected in early 2015. Optimism has surrounded the project even before the appraisals and well tests started being carried out. However given the rout in oil prices of late, there is a risk the project could turn into a bellwether for how deep and fast companies will engage in capex-cutting.

This means that Ghanaian production is unlikely to grow much beyond 250,000 bpd before 2020 and in the 2020-2025 period perhaps only with whatever production rate could come from an eventual Hess-led Deepwater Tano/Cape Three Points development. That might sound like disappointing news for the Ghanaian government and its finances. However, from an industry perspective, it means that growth in Ghana still looks assured at a time when projects are axed around the world and other West African states will see much disappointment. For the oil and gas project supply industry, as well as for different mid- and downstream actors, this should provide for a fairly stable investment environment with some potential opportunities.

Gas, condensates – a route downstream?

One opportunity which only now is starting to be realised is gas, with the first gas production from Jubilee about to start being treated by Ghana's US$1bn Atuabo gas processing plant, which, under the Ghana Gas project, will make gas available for the country's main power utility, the Volta River Authority (VRA).

With Jubilee gas soon no longer being flared and later to be followed by gas from the TEN development, Ghana is not only about to make significant savings on power feedstock costs, it is also about to make itself less reliant on gas imports from Nigeria.

> One opportunity which only now is starting to be realised is gas.

Imports through the West African Gas Pipeline have over the past few years grown increasingly unreliable, with frequent outages and shrinking throughput.

While more offshore projects will need to be identified and developed for Ghana to become self-sufficient in gas, there could well be a growing window of opportunity opening in the country for petrochemical investments using gas and condensates as feedstock in the coming years. Indeed as associated gas starts being developed and monetised, Ghana could be well placed to snap up investment previously targeting Nigeria.

Particularly projects looking for condensate/LPG streams, where competition with domestic power generation will not be an issue and feedstock needs above internal Ghanaian supply easily could be shipped from nearby Gulf of Guinea producers.

Added to this, for the longer term, supply companies, particularly of the more specialised sort, gaining a foothold in Ghana could be well placed to later bank on their experience if and when deepwater developments get underway off Côte d'Ivoire, Liberia and Sierra Leone.

Large international supply actors might in the near future leave smaller and midsized actors to play a significant role in Ghana given the slower-than-initially-expected development pace of the coming decade and the industry-wide cost cutting ahead. Much will however depend on Hess's decision to develop its discoveries in the Deepwater Tano/Cape Three Points block or not. In the current oil price environment, this is where project growth chiefly is to come from post-2017, unless oil prices make a swift rebound during this year. ■

Ghana is using its local content policy to develop a competitive supply chain - Willy H Olsen* reports.

Generating employment opportunities for nationals

GHANA HAS DEVELOPED a modern petroleum legislation since the country made its first major oil and gas discovery in 2007. Tullow and its partners brought the field on stream late 2010. It was named the "Jubilee field" to mark 50 years of independence from the UK. Jubilee's floating production vessel is producing above 100,000 bpd of oil. The Jubilee partners had to re-inject the gas into the reservoir whilst Ghana built the facilities to receive the gas. The gas infrastructure project is now operating with gas used for electricity production.

Ghana experienced a stream of new discoveries after the first success, and more fields will begin production in the next five years. Parliament has approved the development of two new oil and gas fields.

Tullow operates the TEN-project whilst ENI will develop the Sankofa field. The two deepwater fields will come on stream in 2016 and 2017. The US$5bn TEN-project will produce some 80,000 bpd whilst gas will be available in 2017.

Hess has had a number of successful exploratory wells on the Deepwater Tano/Cape Three Points block offshore Ghana and is looking for first production after 2020.

Parliament has strengthened the policy framework through new legislation, regulations and institutions.

- The Petroleum Law, Exploration and Production
- The Petroleum Revenue Management Act
- The Petroleum Commission Act
- The Local Content Act

Parliament is currently considering a new Petroleum Bill to replace the old version where one of the issues is the fiscal terms. It is also aiming to increase Ghana's participation interests in exploration and development.

Transparency and accountability is a priority. Very active and competent civil society organisations are taking active part in the public dialogue.

Ghana has transferred regulatory functions to the Petroleum Commission, whilst the national oil company, GNPC, focuses on the commercial issues. GNPC has clear ambitions of becoming a future operator of oil and gas fields in Ghana.

The Petroleum Commission is responsible for local content, health, safety, security and the environment, as well as community relations.

The oil price uncertainty will have limited impact on the Jubilee fields and the TEN-project, but it can influence progress on other potential projects. A lower oil price will put pressure on the Government's budget and may lead to less spending from the oil companies and the service industry. It can lead to delays in exploration and new projects. A major reduction in the oil price tends to have negative impact on local content policies.

The Kwame Nkrumah FPSO operating in the Jubilee oil fields.

The local content policy

Expectations in the youthful population have been high, looking for economic growth, more jobs, better infrastructure and improved living standards. Ghana's oil and gas reserves are relatively modest and unlikely to transform the economy. The local content policy was a way to increase the socio-economic benefits from natural resource extraction. Ghana's local content legislation came into force in February 2014. The Petroleum Commission is responsible for implementing the policy, monitoring progress and provide a database of local firms capable of delivering goods and services.

The essence of the law is to enable Ghana to get to grips with the oil and gas industry. The policy aim is to:

- Maximise value addition and job creation
- Increase local capacities and involvement in the value chain
- Skills transfer
- Building technological expertise, local knowledge and capacity

The legislation drives the promotion of local goods and services to enhance capacity and ensure national benefits. It gives preference to indigenous Ghanaian companies when they are competing for business.

Transparency and accountability is a priority.

The policy's aim is to generate employment opportunities for nationals:

- Increase involvement of nationals in the oil and gas industry
- Training and development of nationals
- Reduction in use of expatriate staff
- Utilisation of local raw materials, goods and services

Local content targets are an ambitious 70-80 per cent of locally trained management and technical staff within 10 years.

Oil companies' response

Tullow is the leading operator in Ghana. It developed the Jubilee field. Next in line is the TEN-project. The Tweneboa-Enyenra-Ntomme (TEN) fields are located in the Deepwater Tano license, around 20km west of the Jubilee field. Tullow's contracting strategy drives local content developments as long as it is the only company operating and developing the fields. Tullow has involved more than 350 local firms in its activities. Tullow and its partners have made significant socio-economic contributions.

Tullow's objective is to develop and build capabilities and creating a sustainable local supplier base with a skilled workforce. The TEN-project will have more local procurement and local subcontracting than the Jubilee project.

Parliament has recently approved the

Senior drilling supervisor with trainees on board the Sedco Energy during drilling of the Owo-1RA well, offshore Ghana.

development of ENI's Sankofa field. First oil will be available from 2017. Investments are likely to be around US$8bn. The first phase will develop the oil whilst the second phase will produce gas in 2018.

Major international contractors have also developed their local content policies. They are responsible for ensuring their supply chain complies with the local content requirements. They have local vendor management systems that qualify and support Ghanaian supplier developments.

Many Ghanaians are on training programmes in Europe, Houston, Malaysia and in Nigeria.

Technip has been investing in Ghana since 2009. It has refurbished a fabrication yard in the naval base to enable local fabrication. It has created an engineering company in a joint venture with GNPC (30 per cent). The joint venture company plans to do at least 20 per cent of the engineering work for the TEN project in Ghana.

Among the Ghanaian pioneers are Hydra Offshore Group, an oilfield service company that offers offshore and underwater design and engineering solutions. Hydra Offshore is working closely with the Wood Group Kenny's subsea engineering services on a contract for the TEN project.

Zeal Environmental Technologies is providing environmental waste management from on-and-offshore drilling; Seaweld Engineering, which is working on Ghana's second FPSO.

Lack of financing is one of the main obstacles for Ghanaian firms. Most banks charge high interest rates on loans. The local industry argues that it cannot do business, make profit and pay back a loan of such a rate.

The co-ordinator of Local Content at the Petroleum Commission has called on banks to provide improved terms for indigenous companies in the oil and gas industry to derive full benefits from the local content law.

The Enterprise Development Center

The government has commissioned the Enterprise Development Centre in Takoradi. It has a five-year project jointly sponsored by the Jubilee partners. It is under general supervision of the ministry of energy & petroleum and the ministry of trade & industry.

The Centre provides support to Ghanaian small and medium enterprises to enable or empower them to position themselves to take advantage of business opportunities in the oil and gas sector. EDC has been engaged in building a comprehensive database of competitive and efficient local suppliers. More than 250 SMEs may be potential suppliers to the oil and gas industry.

EDC provides a range of services such as business training, capacity building programmes, advisory services, access to market and information, and acts as a focal point for coordination between SMEs and the oil and gas companies, their contractors and sub-contractors.

The Jubilee Technical Training Centre is one of the first vocational training centres in West Africa.

It is often difficult for local suppliers to know about opportunities to supply goods and services to the IOCs/Contractors or Sub-Contractors. Lack of information about opportunities is a barrier. EDC has been disseminating valuable information related to procurement such as the industry's standards and requirements, opportunities generally and opportunities individually.

International oil companies, suppliers and service providers in search of local suppliers often have difficulty in identifying and assessing the suitability of Ghanaian suppliers. Most of them have a relatively short record of accomplishments, but international firms realise that involvement of local firms are critical for success.

Local SMEs will often face an information block. Where and how can they access information regarding tendering opportunities? They may find it difficult to identify the entry point to the supply chain.

They lack the muscles required to perform technical disciplines as required by the oil and gas sector. Many local SMEs may also have a phobia for investing in staff training due to their high turnover rate.

The Ghana Business Linkage Programme nurtures mutually beneficial business relationships between large corporate entities operating and about 150 small and medium sized enterprises. The programme operates in line with the Local Content Policy to guarantee active participation of Ghanaian SMEs and stimulate growth of indigenous capacity.

The local content legislation has enabled and given SMEs the confidence to approach IOCs and offer services. They are getting to grips on what it takes to be part of this new sector.

> Major international contractors have also developed their local content policies.

High focus on education

Labour is abundant in Ghana but the oil and gas industry requires appropriate skills. Education is central to the implementation strategy in the Local Content regulations.

In order to overcome the skills gap in the country, the government, in conjunction with the oil companies as well as higher education, will appraise the employment challenges in the labour market and develop capacity-building programmes to address the critical issues.

Promotion of science based programmes by pumping money into the training institutions can contribute to reducing the skills shortages.

Capacity building of the youth and the local contractors along the value chain is one of the priorities to ensure the local content law for the oil sector becomes a success; also encouraging collaboration between the industry and the educational institutions where the industry can assist educational institutions in providing industry certification programmes.

Training has also brought oil companies closer to the Ghanaian SMEs since they often are involved in the training programmes.

The Oil and Gas Capacity Building Project targets human capital development by providing support to selected tertiary institutions including the Kwame Nkrumah University of Science & Technology (KNUST) to improve teaching and research in the field of petroleum engineering and petrochemical engineering.

Training implemented by the oil companies and the Enterprise Center has enhanced the capacity of many SMEs on issues such as compliance business systems, environment, health and safety, tendering and procurement.

The oil companies and oil industry have also developed close ties to the educational institutions in Ghana. The Norwegian contractor, Aker Solutions, is co-operating with the College of Engineering at the University of Science and Technology in Kumasi.

GNPC-Technip Engineering Services has built close ties to the Kumasi University (KNUST), since 2011 and the Regional Maritime University (RMU) since 2013.

The Jubilee Technical Training Centre is affiliated to Takoradi Polytechnic. The centre exposes students to the technological world, helping to bridge the skills gap in the industry.

The Oil & Gas Safety Training Centre at the Regional Maritime University (RMU) delivers safety mandatory courses for the Offshore Oil & Gas Industry.

The dramatic fall in the price of oil may influence the developments of the resources. ENI and Vitol have still decided to go ahead with the third large project, aiming for first oil in 2017. The lower oil price will however lead to reduced income from the oil and gas sector. Most analysts expect now that the oil price will be under pressure well into 2016. ■

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Ghana

Ghana signs US$7bn gas production deal

THE GHANAIAN GOVERNMENT has signed a US$7-bn deal with Italian oil giant ENI and Dutch-owned energy firm Vitol for the production of 180mn cfng. "It's been a long road from when exploration started to today, when we finally have the opportunity to sign the official agreement for the beginning of development of production of the offshore Cape Three Point project," Ghanaian President John Mahama said after the signing ceremony.

"We expect the gas will be able to produce an additional 1,100 MW of power for Ghana," he said. He added that the field would likely produce natural gas for the next 15 to 20 years.

"I am particularly excited about this development. We will do whatever we can to ensure this project comes on stream as soon as possible," he asserted. The project is expected to come online in 2017. The Ghanaian president described the deal as the single-largest investment in an African country to be made this year.

"Last year, it was anticipated that foreign direct investment in Africa would amount to some US$53.3bn," he said. "This current agreement, signed for the investment in offshore Cape Three Point, is to the tune of US$7bn – that's about 12 per cent of the total US$53.3bn," crowed Mahama.

Tiro Anthonio Magano, ENI's executive vice president, said the deal marked the beginning of a new era, when Ghana would begin producing its own gas with its own power plant, providing the country with a stable power supply.

"We were here in the early 60s to build and commission the Tema oil refinery," he recalled. "Over 50 years later, we are here again to commence a long-term project."

Vitol chief executive Ian Taylor, for his part, said the firm hoped to help Ghana develop.

"I am delighted that, after starting this project in 2007, it is beginning to become something," he said. "Now we have to get on and make it happen."

Jubilee Field operating cost incredibly low

CASH OPERATING COSTS for Tullow Oil's West Africa operations remain low, averaging around US$13 per barrel in 2014, according to the company's latest statement. Operating costs for the Jubilee field averaged around US$10 per barrel in 2014 "with potential to drive down costs further in the current market ahead of realising synergies relating to the combined Jubilee and TEN operations". TEN refers to a cluster of fields the company is developing with the view to first oil in 2016.

West Africa remains the jewel in the crown for the company. In 2014, underlying production performance in the region was within guidance averaging 65,300 bopd. "However, due to ongoing licence discussions in Gabon, which are yet to conclude, Tullow will report in 2014 a reduced working interest production of 63,400 bopd".

Tullow Oil says the Jubilee field exceeded its gross production target during 2014, averaging 102,000 bopd "despite the restrictions caused by delays in the construction of the onshore gas processing plant by the Ghana National Gas Company". The company expects average gross production to be at a similar level in 2015, with production building towards the FPSO capacity (which is 120,000 bopd) by the end of the year. "The gas plant is now complete and first commissioning gas was exported in November 2014 from the Jubilee field. As the gas management constraint is reduced due to increasing gas exports, Tullow will be able to increase the oil production from Jubilee". Elsewhere in Ghana, the important TEN development project is progressing very well and is now over 50 per cent complete and remains within budget and on-track to deliver first oil in mid-2016.

Anchor piles being fabricated in Ghana

WORK AT GHANA's brand new facility has started on the fabrication of nine anchor piles for Ghana's second FPSO vessel, which will start producing oil from the Tweneboa, Enyenra and Ntomme (TEN) fields in mid-2016.

The fabrication is underway in a new facility constructed by Tullow Oil in Sekondi in the country's Western Region. The facility is built on land leased by the Ghanaian Navy.

Following the completion of the anchor piles in April 2015, the facility will be used to fabricate jumper spools for the TEN Project, which will connect subsea production equipment on the seabed.

Development of the TEN Project is being led by Tullow Oil, with partners Ghana National Petroleum Corporation, Kosmos Energy LLC, Anadarko Petroleum Corporation and PetroSA.

The TEN Development Plan was approved by the Ghanaian Government in May 2013 and requires the drilling and completion of up to 24 development wells. These will be connected through subsea infrastructure to a FPSO vessel currently under construction in Singapore.

A second new fabrication yard, also commissioned to fabricate components for the TEN Project, will soon open in Takoradi port. Being built by Subsea7, this facility will be used to fabricate anchor piles for subsea manifolds.

Working in collaboration with the Petroleum Commission, the TEN Project is committed to maximising the amount of work undertaken in Ghana. Earlier this year, module support stools for the FPSO were fabricated by Seaweld Engineering Ltd and Orsam Ltd in Tema and Takoradi, subsea mud mats are currently being fabricated by Harlequin International Ghana Ltd and Accra-based Hydra Offshore Group is supplying engineering services to the project.

Ghana plans to cut gas supply from Nigeria

INDICATIONS HAVE EMERGED that Ghana is planning to reduce its dependence on 'unreliable' gas supply from Nigeria in the coming year.

It was gathered that the neighbouring country has begun processing gas from its offshore Jubilee oil field through a pipeline project that could save the government over US$300mn a year on fuel costs.

Ghana's new Atuabo Gas Processing Plant was recently streamed, supplying 50mmcfd of gas to nearby thermal power generators operated by the Volta River Authority (VRA) power utility in the western town of Aboadze, to provide a projected 500 MW of electricity.

Meanwhile, plans are also in the pipeline by the Nigerian energy group, Sahara Energy, to build a thermal plant in Ghana by next year, to buoy the generation capacity of the country.

A statement from Ghana Gas said the Atuabo Gas Processing Plant plant has also produced 3,000 tonnes of liquefied petroleum gas and condensate as by products.

Two more gas fields are expected to come on stream by 2017 to add to Jubilee, which is operated by British firm Tullow Oil.

The government is in talks with the Qatari government for the supply of natural gas and there are other private investments underway, including planned production by Italian energy firm Eni from the Offshore Cape Three Points (OCTP) block beginning 2017.

Director of technical operations at Ghana Gas, Ben Asante, said: "Atuabo remains a vital cushion for the current unreliable gas supply from Nigeria and would remain in operation for the long haul."

Ghana has recently complained of a shortage of gas supply through the West African Gas Pipeline (WAGP) system.

However, a source at Sahara Energy's Ghana country office stated that the energy group was holding discussions with the Volta River Authority (VRA), which it still lifts crude oil for, towards the construction of the about 2000 MW-plant in Ghana.

Sahara Energy started operating in the country in 2001 when it lifted crude oil for the Tema Oil Refinery and the VRA. "We just completed the plant in Nigeria. As it has been our trademark, we want to complete all the learning process before we replicate it here in Ghana," the source said.

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Recruitment

OilCareers.com and Air Energi's 2014 H2 Global Workforce Survey recently delved into the oil and gas market with a particular focus on gender imbalance within the industry. More than 4,300 employees and hiring managers took part in the survey, including a large number of respondents from Africa, which looked at the issues surrounding the lack of women taking on key roles in the sector.

New global workforce survey evaluates gender imbalance in Africa

THE SURVEY REINFORCED the general perception of the oil and gas industry as a male-dominated environment; indeed 88 per cent of employees and 68 per cent of hiring manager respondents were male. However, it is encouraging that a large proportion of these recognised the positive benefits that closing the gender imbalance could make to the industry and participants expressed a strong desire for change.

70 per cent of respondents stated that the industry would gain access to a wider talent pool at all levels if the gender gap was addressed. 52 per cent also felt it would increase productivity and organisational success.

Mark Guest, managing director of OilCareers.com said: "The results suggest the issue is manifest by the lack of female role models in senior and leadership positions, and in the pressing need to encourage more young women to take up science, technology, engineering and mathematics (STEM) subjects in higher education."

The survey showed that the imbalance is undoubtedly a real issue in Africa with 59 per cent of respondents in the region reporting it as a concern. For example, the shortage of female engineers in Africa is even more prevalent than in other industry centres across the world. In the oil and gas market, where lack of personnel in key disciplines is prominent, increasing the number of women in geophysics and engineering within any company could provide a competitive advantage.

All African countries emphasise localisation content policies - focusing on their commitment to delivering local development, with many of the major operators and EPCs investing in local training and development programmes. The results are coming slowly but surely, and more locals are working in Nigeria and Angola, for example.

The survey assessed what factors contribute to the gender gap. In Africa, 55 per cent stated that HSE risks associated with the physical working environment played a key role in deterring women from entering the industry.

Mr Guest commented: "These findings suggest that the imbalance is something of a self-fulfilling prophecy. Industry culture is much harder to change when there is a lack of women entering the workplace; in turn this is reflected in the greater proportion of males applying for jobs within the industry compared to females.

"This is exacerbated by the lack of young women currently studying Science, Technology, Engineering and Mathematics (STEM) subjects in higher education in all regions around the world."

Nigeria's minister of petroleum resources, Diezani Allison-Madueke - one of the very few female role models.

A step in the right direction

Wits Business School in Johannesburg, South Africa, recently held a successful seminar focusing on the opportunities and challenges for women in the oil and gas industry. Speakers including Phindile Nzimande, CEO of the National Energy Regulator of South Africa (NERSA) and Wrenelle Stander, managing director of Sasol Gas, addressed over 250 professionals and students. Both spokeswomen stated that while more young women are graduating from high school and university with mathematical and science skills, only a small proportion are opting to apply these abilities to the industry.

HSE risks associated with the physical working environment played a key role in deterring women from entering the industry.

This argument is given weight by the fact that 49 per cent of respondents also identified the industry culture created by a male dominated environment as an issue deterring young women from entering the oil and gas industry.

The survey also highlighted the industry needs to adopt a flexible approach to the domestic responsibilities of all employees whether they are male or female, with an understanding that many hold a role both at work and home.

Mr Guest commented: "However, it is clear that steps have already been taken to close the gender gap in Africa with 49 per cent of respondents reporting their company has an active policy to encourage more women into oil and gas roles."

Some of the most effective initiatives seen have been through organisations including WomEng and GirlEng, who operate programmes to attract women into the industry, and up-skill those already in it. The organisation – run by volunteers – focuses on improving engineering education, mentorship, skills development, leadership and innovative problem solving.

The aim of these initiatives is to increase the number of females taking engineering subjects, and increase in the number of females entering the workforce.

Mr Guest concluded: "This shows positive signs that the issue is recognised across the continent, and the industry in Africa is working towards a more balanced workforce." ■

The number of women working in the oil and gas industry is growing faster than ever - Shell planning engineer, Nikolle Rodgers is just one of them.

Swala completes Kilombero Basin seismic programme

SWALA OIL AND Gas (Tanzania) Plc has successfully completed its 430km 2D seismic programme over the Kilombero Basin in central Tanzania. Swala Tanzania has a 50 per cent net interest in this licence and is the operator.

Dr David Mestres Ridge, Swala's CEO said "This is a major achievement by Swala as we have now completed our work programme commitments for the past three years on the Kilosa-Kilombero exploration area. When we were granted the licence, no hydrocarbon exploration activity had ever before been carried out over the area. We have broken new ground, proving three sedimentary basins and in the Kilombero basin, multiple structural leads and prospects in a young (Neogene) basin. We are now looking forward to the results of detailed mapping, basin modelling and seismic amplitude anomalies before targeting our drill candidate."

As announced earlier, the seismic programme identified a series of structural leads on the western margin of the basin. The geometry of this 'string of pearls' is strongly analogous to that seen elsewhere in the East African Rift System, notably in the Lokichar Basin of Northern Kenya where a series of oil discoveries have already been made by Tullow Oil.

The company has already identified the Kito Prospect, with estimated 60.4mn barrels of P50 Best Estimate Prospective Resources net to Swala, as a potential drilling target for 2015.

The new seismic data are currently being processed ahead of detailed interpretation that aims to map additional potential drilling targets for a concerted drilling campaign. The company will carry out basin modelling and seismic amplitude studies to help rank the prospect portfolio ahead of these planned drilling activities.

Hydrocarb moves ahead in Namibia

HYDROCARB ENERGY CORPORATION is preparing to issue Request For Proposals to four seismic acquisition contractors to complete a 750km two-dimensional seismic programme on its 21,300 sq km Owambo Basin concession. Comprising blocks 1714A, 1715, 1814A, and 1815A in northern Namibia, the concession is adjacent to the Angola border. Seismic data will be acquired to confirm 16 new structural leads discovered by a proprietary aerial gravity and magnetics programme the company flew in 2013.

Approximately 15 per cent of Hydrocarb's 21,300 sq km concession has been explored with modern 2D seismic data to date. Environmental assessment work, currently underway, will be complete in early 2015 as a prerequisite to the seismic project.

Netherland, Sewell & Associates Inc (NSAI) has assigned 1.1bn barrels of unrisked potential in-place oil resources in the Oponono Prospect. Unrisked potential recoverable oil resources from this single prospect range from 46 to 295mn barrels of oil.

Chuck Dommer, Hydrocarb's president stated, "We are moving ahead with the seismic project, and our next step is to bring in an industry partner to expand our exploration efforts in the Owambo Basin."

Hydrocarb Energy holds a 90 per cent working interest in the highly prospective Owambo Basin concession in northern Namibia with Namcor, the Namibian National Oil Company, holding the remaining 10 per cent. Extensive geologic field studies were completed last year proving the existence of excellent high-porosity reservoir rocks as well as soil sampling indicating the presence of crude oil derived from a carbonate source.

Seabird's Northern Explorer bags LOI for 2D seismic

NORWEGIAN SEISMIC SURVEY company SeaBird Exploration Plc has reported that Northern Explorer has signed a letter of intent (LOI) for a 2D seismic survey in West Africa. The survey size is approximately 1,700 km with an estimated value of US$1.3mn.

Northern Explorer.

The project is expected to start in February and will have an estimated duration of two weeks.

SeaBird is a global provider of marine acquisition for 2D/3D and 4D seismic data, and associated products and services to the oil and gas industry. SeaBird specialises in high quality operations within the high end of the source vessel and 2D market, as well as in the shallow/deep water 2D/3D and 4D market. The main focus for the company is proprietary seismic surveys (contract seismic), and the company's main success criteria are an unrelenting focus on Health, Safety, Security, Environment and Quality (HSSEQ), combined with efficient collection of high quality seismic data.

Shell awards large contract to Nigerian firm

SHELL NIGERIA HAS awarded a one-year seismic processing contract to CB Geophysical Solutions (CBGS), a Nigerian technical service company. The initial commitment is 1,000 sq km three dimensional (3D) seismic data.

"It's a major step in domesticating seismic data processing in the country", said Bank Anthony Okoroafor, CBGS' chairman and chief executive officer. He said the company's processing suite can handle 8,000 sq km of 3D seismic data in parallel. "Our company was chosen for its competence in Health, Safety and Environment (HSE) and quality delivery", he declared. "CBGS is involved in seismic data acquisition, processing, interpretation, field development planning, geological and geophysical studies and seismic acquisition QA/QC as well as data storage. It is a 100 per cent Nigerian-owned company with top class professionals"

Bayo Ojulari, who is Shell Nigeria's general manager for development, commented on the award: "We've seen a lot of companies that just make noise. They come to our offices, they drag our shirt at conferences, you give them time, you follow up and at the end of the day, all your efforts and all your energy turns out into non-productive outcome. For me, since I have been in Shell, in the sub-surface arena, CBGS is the first company that by the time its chairman was talking to me, I knew the company had something to offer".

Okoroafor maintained that CBGS "is built on leading edge proprietary software and technology in seismic acquisition and processing, stratigraphic and structural interpretation, integrated reservoir characterisation, geologic model and reservoir simulation, coupled with its highly experienced and innovative work force, advanced hardware and data processing capabilities".

"Apart from capabilities in Prestack Time Migration (PSTM), Prestack Depth Migration (PSDM) and Reverse Time Migration (RTM), and a range of processing competencies on land and marine data, this three-year-old company is also involved in seismic interpretation, studies (geological and geophysical, petrophysical) (inversion/AVO) (remodelling/ field reviews, reservoir characterisation, exploration target evaluation, fast track studies, reserve evaluation for field development plans)", Okoroafor contended.

Development drilling campaign starts at Reggane Nord gas project

THE REGGANE NORD consortium that includes RWE Dea has commenced development drilling at the gas project in the Algerian Sahara. 26 development wells are planned for the first drilling campaign. The start of gas production is scheduled for summer 2017.

The first development well KL-39 was spudded at the end of January, with KCA Deutag Rig T-211. It's the first of a total of 26 development wells, which are planned to be completed during the first drilling campaign. Further production wells are foreseen in the course of the development of this project.

"We are delighted to reach this next stage in the project, after detailed preparation work with all partners over recent months," said Christoph Schlichter, senior vice president production North Africa of RWE Dea AG. "We are looking forward to a successful drilling campaign. The expected reserves of the project will make a significant contribution to the growth of Dea's gas production in the years to come. That's why we are pleased that the project is in time for start of production in summer 2017", Schlichter remarked.

Among the 26 development wells 21 wells are expected to be drilled, completed and put on production until the first gas date. Another five wells are planned to be drilled and added to production afterwards. The production phase of the project is expected to span more than 25 years.

The Reggane Nord project comprises the gas fields of Reggane, Azrafil Sud-Est, Kahlouche, Kahlouche Sud, Tiouliline and Sali. The Groupement Reggane-Nord (GRN) partners are RWE Dea AG, Sonatrach, Repsol and Edison from Italy. In 2002, Dea started exploration activites in the concession area Reggane Nord together with partners Repsol (operator) and Edison with corresponding gas discoveries, which are now subject to development under the operation of GRN.

Mozambique must speed up LNG projects

MOZAMBIQUE MUST COMPLETE contract negotiations for the production of LNG and also fast track key structural reforms to maintain strong economic growth, the International Monetary Fund has said. The IMF forecasts the nation's economy to expand by 7.5 per cent in 2014 from seven per cent the previous year, but said delays in implementing reforms to tax administration and public financial management could hurt medium-term growth.

The 2014 forecast is down from a previous projection of eight per cent.

"Completion of the contract negotiations for the production of liquefied natural gas (LNG) is a critical milestone for the launch of this project, one of the largest in sub-Saharan Africa," the IMF said in a statement.

Despite the heightened risks from an uncertain global outlook, Mozambique growth would remain strong in the medium term, boosted by natural resource and infrastructure investment, the IMF said.

Mozambican officials expect more than US$30bn will be invested initially in the natural gas sector to build capacity to produce 20mn tonnes per year of LNG, with first exports due to start in 2018.

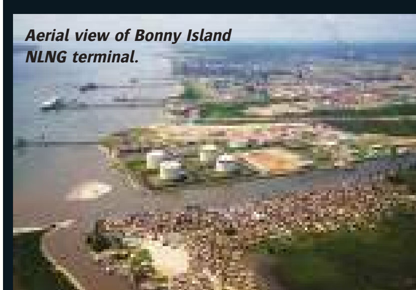
Gulfsands sees good result at Moroccan well

GULFSANDS PETROLEUM HAS confirmed as a gas discovery the Douar Ouled Balkhair 1 gas exploration well (DOB-1) in northern Morocco. It said that during testing of the discovery, gas flowed to the surface at rates in excess of 10mn cfd. DOB-1 has now been suspended as a future gas production well. The company also reported that its Dardara Southeast 1 well (DRC-1) in northern Morocco has flowed at 7.1mmcfd of gas following well perforating, completion and clean-up operations.

NLNG monetises four trillion cfg

THE NIGERIAN LIQUEFIED Natural Gas (NLNG) Ltd has monetised four trillion cubic feet of Nigerian gas since first production in September 1999. The company has delivered US$20bn in dividends to its shareholders, the largest of which is the NNPC, the state hydrocarbon company.

NLNG Ltd reeled out these figures in a video documentary recently. NLNG was the world's fourth leading exporter of liquefied natural gas (LNG) in 2012. The documentary notes that the NLNG plant in Bonny, in eastern Nigeria, consists of six gas liquefaction trains which, at peak operation, require 3.5bn scfd and can deliver 22mn tonnes per annum (TPA) to customers worldwide. It produced 19mn TPA in 2012. Gas flows into the Bonny LNG plant through transmission lines from processing facilities operated by NLNG's three European shareholders: the AngloDutch major Shell, the French explorer TOTAL and Italy's largest company ENI, as well as the Nigerian independent Niger Delta Petroleum. Shell provides gas from onshore Gbaran Ubie, Soku and Bonny fields, as well as deepwater Bonga and shallow water EA fields. ENI contributes from the Obiafu Obrikom (OB-OB) Integrated Gas Centre, a gathering point for gas molecules from Idu, Akri, Kwale, Irri, Tebidaba and Ebocha fields, all onshore. TOTAL, the French major, transfers gas to the NLNG Plant from its onshore Obite, Ibewa and Obagi fields as well as deepwater Akpo field and shallow water Amenam-Kpono field. Niger Delta Petroleum supplies gas from the Ogbele marginal field, onshore.


Aerial view of Bonny Island NLNG terminal.

Aminex moves closer to 1st gas production from Kiliwani

INDEPENDENT OIL AND gas firm Aminex has edged closer to first commercial gas production from its Kiliwani North field in Tanzania, after reporting that the pipeline construction from Songo Songo has been completed. The firm also reported that Tanzanian Petroleum Development Corporation is now constructing the skid metering unit within the boundaries of the Kiliwani North Development Lease prior to tying-in the Kiliwani North-1 wellhead. Pressure testing of the pipeline is expected to begin shortly and the final construction equipment required to connect KN-1 is also expected soon. The KN-1 well, when connected to the export pipeline, is expected to produce at least 20mn cfd of gas. Gas from KN-1 will be processed at Songo Songo and then be sold in the Dar es Salaam to Mnazi Bay pipeline.

Aminex CEO Jay Bhattacherjee commented in a company statement:

"As the Dar es Salaam to Mnazi Bay pipeline nears completion and the final stages of construction are now occurring on the Kiliwani North-1 well, we look forward to first commercial gas production from the field which will place the company in the position of being the first new Tanzanian gas producer in recent times."

Anadarko proves more pay offshore

ANADARKO HAS ISSUED an update on its exploration and development operations offshore Mozambique.

Late last year the Orca #4 appraisal well was completed on the Orca discovery in Offshore Area 1, after encountering natural gas pay in two reservoirs.

Analysis is under way to define future appraisal requirements and an optimum potential development scenario.

Late last year, drilling of the Tubarão Tigre #2 began, the first appraisal well of this 2014 discovery.

During 4Q, the government of Mozambique gazetted its Decree Law, designed to help provide the appropriate framework for a

stable business environment for investors, customers, financiers, and construction contractors. This is expected to benefit Anadarko as it advances its large-scale LNG project to harness gas from its various deepwater fields.

The Offshore Area 1 partners also continued to progress long-term LNG sales agreements, recently adding non-binding heads of agreement (HOAs) with customers in Asian markets. The HOAs in place now cover a total of more than 8mn metric tons/yr.

In block CI-103 offshore Côte d'Ivoire, appraisal drilling on the Paon discovery has been encouraging, Anadarko says. The Paon-3AR, drilled 5.9 km downdip to the discovery well encountered more than 28.6 m of pay.

Vaalco produces from second offshore Gabon development well

VAALCO ENERGY INC has first production from Etame 10-H, the second development well drilled from the newly installed Etame platform offshore Gabon.

The horizontal development well was drilled to a measured depth of 3,144 m while intersecting more than 180 m of high quality reservoir within an oil-bearing portion of the Gamba Sand. Following completion operations, the well was tested at the rate of approximately 3,200 bpd on a gross basis with negligible amounts of water and no hydrogen sulfide. The well is currently being produced at about 3,000 bpd.

Image source: Wintershall

The contracted jackup Transocean Constellation II is being mobilized to drill additional development wells from the Southeast Etame/N. Tchibala platform, beginning with the Southeast Etame 2-H well in the Southeast Etame field.

Following the mobilisation of the jackup, Vaalco plans an extended well test of the Etame 8-H well, drilled in 4Q 2014, to confirm and quantify the presence of H_2S, which was detected during the initial 17 hour flow test. The well test is expected to occur later in 1Q 2015.

Bowleven to start drilling in Cameroon

BOWLEVEN, THE WEST Africa-focused oil and gas firm, expects to start exploration drilling onshore Cameroon shortly.

The Edinburgh-based firm said drilling will start on the first well on the Bomono licence, Zingana, in February following "some minor logistical issues which have now been resolved".

In December Bowleven said drilling operations were expected to commence on Bomono around the end of the year.

The company, led by chief executive Kevin Hart, said civil engineering activities continue with the preparation of the second well site, Moambe.

The well will be the first drilled onshore Cameroon by Bowleven, which has focused activity in the waters off the country to date.

The bulk of the well costs will be paid by privately-owned Africa Fortesa Corp, in exchange for a 20 per cent stake in the licence.

AIM-listed Bowleven has funding in place to carry its agreed share of up to around US$15m of the cost of the wells.

The company is waiting to complete a US$250mn deal to sell a total 50 per cent interest in the Etinde permit off Cameroon, which it agreed in June.

The company is awaiting formal written notification and gazetting of a decree by Cameroon's president Biya approving the deal.

On 9 January Bowleven said the formal decree approving the assignment of interests in Etinde to Russia's LUKOIL and Cameroon's New Age had been signed by the president. It noted then that formal written notification and the gazetting of the decree was the final condition of the Etinde farm-out.

Tender Oil & Gas inks 2 PSCs in Senegal

SERBIA'S TENDER OIL & Gas Casamance SARL (TOG), a Tender Group subsidiary, has recently signed a production sharing contract (PSC) with Senegal's Ministry of Energy and Petrosen - the national oil company of Senegal. With the approval of the president of the Republic of Senegal, Macky Sall, the PSC was signed for two onshore blocks – Saloum and Senegal Onshore Sud, totalling 28,897 sq km – it gives TOG license and exclusive rights for hydrocarbon exploration for the next eight years.

Initial exploration investment is expected to increase during the development and production phase, resulting in drilling wells for new oil and gas production sites on Senegal soil. If commercial discoveries are made, the Republic of Senegal could benefit in profit share and in various tax revenues.

"If prospects on these blocks prove to contain commercial quantities of oil and gas, it will contribute to the continued economic growth of Senegal, helping create new jobs for Senegalese people, provide additional taxes and royalties to fund government programmes, and reduce the country's reliance on imported energy supplies," said Gehrig Schultz, president of TOG management board.

"Tender Group is constantly searching for additional promising and challenging geological areas. We believe that this partnership is an opportunity to expand our strong presence in the region and this new strategy allows us to increase our knowledge about the favorable geology of Senegal," added Ovidiu Tender, owner of Tender Group.

As part of the agreement, TOG will intensively train industry specialists to ensure high quality work and will support national Senegalese social programmes in order to contribute to the prosperity of the region. Part of the obligatory US$42mn investment made by TOG will be allocated to these actions. TOG holds a 90 per cent working interest in the two areas, with Petrosen holding the remaining 10 per cent.

TOG's goal is to lead 2-D seismic exploration in the area and re-process old data to discover new drilling opportunities. When commercial discoveries are made, Tender Oil & Gas will look for exclusive rights to oil and/or gas production for between another 25 and 35 years.

NDPR strikes oil onshore Nigeria

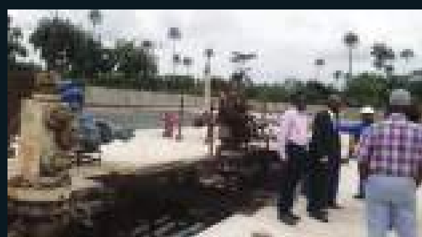
NIGER DELTA PETROLEUM Resources (NDPR) has discovered crude oil in Ogbele-9 appraisal well onshore eastern Niger Delta in Nigeria.

Gas from Ogbele is currently being produced from the G3 reservoir in Ogbele-1 appraisal well.

According to NDPR, the results of Ogbele-9 arrived just months after the company found 117.95 metres of net gas sand in Ogbele-8 appraisal well.

Ogbele-9 is expected to be completed and put into production but technical challenges have impeded progress at work, revealed the Nigerian company.

Layi Fatona, managing director of NDPR, said, "Although the field, which commenced production of crude oil in 2005, also provides 736,238 cu m of gas to the Nigerian Liquefied Natural Gas system in Bonny, Ogbele has not been considered primarily a gas field."



NDPR's first asset, Ogbele Field.

Samson Ojehonmo, an energy analyst, added that the recent oil discoveries have made the Ogbele field emerge bigger than initially defined in 2005.

East Africa to auction more blocks in 2015

EAST AFRICA IS riding a wave of change in the management of exploration and production rights of its newly struck oil and gas resources amid growing pressure for transparency and accountability.

In a latest development, Uganda has launched an oil-exploration licensing round for six blocks in its Lake Albertine Rift basin. The blocks on offer include at least four lucrative discoveries through an open competitive bidding process, energy and minerals minister Irene Muloni has said, adding that new licenses would be issued by the end of 2015.

"We have an estimated 6.5bn barrels of oil in place from exploration work in less than 40 per cent of the Albertine Graben. However, less than 10 per cent of the Graben is currently licensed and the six blocks targeted for this maiden licensing round have good data coverage," Ms Muloni added.

The blocks on offer cover a total of 2,982 sq km along Uganda's western border. Companies are expected to submit bids for the blocks over the next three months and those with successful bids will proceed to commence talks with government.

The development comes just after Uganda selected a unit of Russian defense conglomerate Rostec to build a 60,000 bpd-day refinery.

"Low prices will not stop us from continuing with our preparations," Ms Muloni told reporters in Kampala. "Oil prices are usually cyclical, hopefully by the time we start production, the trend will be upward."

Neighbouring Tanzania, a hotspot for natural gas exploration, has already received bids for some of the eight oil and gas blocks it offered in its latest competitive bidding round. CNOOC Ltd Gazprom were among companies that submitted bids for the blocks on offer in the fourth round. Statoil and ExxonMobil, which have made big gas discoveries off Tanzania, submitted a joint bid for one of the offshore blocks.

CNOOC will battle with Statoil and ExxonMobil for offshore block 4/3A, which covers 2,620.3 sq km. Gazprom applied for block 4/3B offshore Tanzania, covering an area of 3,045 sq km.

Abu Dhabi state-owned investment fund Mubadala applied for offshore block 4/2A, which covers an area of 3,630 sq km, while another UAE firm, Ras Al Khaimah Gas LLC, has submitted a bid for the Lake Tanganyika North block, with a size of 9,670.2 sq km. Four offshore blocks, 4/3B, 4/4A, 4/4B and 4/5B, did not attract any bids.

Winners of the latest bidding round will be subjected to new production sharing agreements (PSA) terms that toughen some of the conditions for energy firms seeking to explore and develop the east African nation's big gas prospects.

Tanzania has so far signed 25 PSAs with some 17 international energy companies, including BG Group, Statoil, Brazil's Petrobras, Royal Dutch Shell, Exxon Mobil and Mubadala Petroleum.

Kenya also plans to switch to bidding rounds to license its oil exploration blocks, moving away from one-on-one negotiations with firms, as interest in its economy increases following a recent oil discovery.

"Once we have the new law in place we shall put up several blocks that we have mapped out for bidding," said Martin Heya, head of petroleum at Kenya's energy and petroleum ministry.

Kenya has mapped out at least eight additional exploration blocks that will be put up for bidding under the proposed laws. Uganda and Kenya are on track to become oil exporters by late 2018 or early 2019.

KANFA secures EPC contract for FPSO Yinson

SEVAN MARINE ASA reported that its subsidiary KANFA AS has been awarded a Letter of Award (LOA) for the engineering, procurement and construction (EPC) contract for four process modules for the FPSO Yinson Production. The contract is expected to have a duration of 15 months with a contract value of approximately US$50mn.

The FPSO Yinson Production will be deployed at the recently sanctioned Offshore Cape Three Points Block (OCTP), located in the Tano Basin, around 60 km off the cost of Ghana. The OCTP Block is operated by Eni's subsidiary Eni Ghana and the joint venture partners; Vitol Upstream Ghana Limited and Ghanaian state-owned Ghana National Petroleum Company.

This contract award marks the continued recognition of the KANFA Group as a leading independent process, design and engineering group for the Offshore Oil & Gas Industry.

FPSO Yinson Production. Image: Wessel Blokzijl/Shipspotting.

Mozambique extends bid round until April 2015

MOZAMBIQUE HAS EXTENDED the deadline for submission of bids in its fifth open lease sale to 30 April 2015. The initial deadline of 20 January 2015 was announced at the launch of the bid round in London in late October 2014.

Industry regulator National Petroleum Institute (INP) says the extension is to allow companies additional time to complete applications, as a number of them have complained about the tight time frame of the bid round.

The announcement of bid round extension comes days after a new cabinet was assembled by new President Filipe Nyusi. The cabinet excludes Esperança Bias. The ministries of energy and mineral resources have now been merged under Pedro Couto, deputy minister of finance in the previous government.

Last December, the outgoing cabinet approved a new Petroleum legislation, which is an extensive revision of the 2001 Petroleum Law, essentially responding to uncertainties around financing terms, the development of LNG Facilities, the LNG Facilities Agreement, the main terms for consortium companies to develop LNG Facilities, the unitising of cross boundary facilities, LNG facilities contracts, the prioritisation of mega projects, the Final Gas Master plan, Government revenues and pricing formulas. The terms of the bid round will be largely governed by this law.

In the new law, Mozambique has set a royalty rate of 10 per cent on oil and six per cent on gas, but these rates will be reduced by half for domestic market obligation output.

The 15 blocks on offer in this bid round are located in the prolific offshore Rovuma basin, as well as offshore Zambezi and Angoche basins and onshore around the Pande-Temane concession and Palmeira.

There are 74,724 sq km of acreage in this round. In the deep-water areas 11 blocks in the northern Rovuma Basin, Angoche Basin and Zambezi Basin are available, with the other four being onshore. Three blocks – R5-A, R5-B and R5-C – are also up for grabs in the prolific Rovuma offshore basin, close to Areas 1 and 4 where Anadarko and Eni made their large gas discoveries, now under development. In the Angoche area, two blocks – A5-A and A5-B – are on offer, while there are six blocks in the central Zambezi area: Z-5-A, Z5-B, Z5-C, Z5-D, Z5-E and Z5-F.

Ghana's OCTP project gets go-ahead

President Mahama launches Cape Three Points Integrated Oil & Gas project.

ENI'S OCTP PROJECT in Ghana gets the go-ahead, with first oil expected in 2017.

Eni has signed an agreement with parties that include the Ghanaian government to proceed with the Offshore Cape Three Point integrated oil and gas project in Ghana.

Eni, Vitol, Ghana National Petroleum Corporation, Ghanaian President Dramani Mahama and minister of petroleum Emmanuel Armah-Kofi Buah signed the agreement for the project, which is expected to produce first oil in 2017 and first gas in 2018. Peak production is expected to be 80,000 boed in 2019.

A deep offshore development, the OCTP project is located approximately 58 km off Ghana's coast. It comprises oil and gas non-associated gas fields and will access around 1.45 tcf of gas and 500mn barrels of oil in place.

Eni CEO Claudio Descalzi commented:

"The OCTP development is a robust integrated oil and gas project that will provide the reliable energy source needed to accelerate the economic growth of Ghana by delivering a domestic solution to feed the power sector."

Sacoil completes Phase 1 of Lagia in Egypt

SOUTH AFRICA-BASED oil and gas firm, SacOil Holdings, through its subsidiary, Mena International Petroleum Company Limited, has successfuly completed the phase 1 of the field development operations at the Lagia oil field in Sinai, onshore Egypt, on time.

The aim of phase 1 was to stimulate and re-complete the five existing production wells at the Lagia oilfield in order to increase production. Operations started on the 4th January 2015 and initial production indications are positive. Sacoil is confident that the targeted average production of 350 bpd will be achievable from these five wells once they are in sustained production.

The oil produced from the Lagia field is trucked to the GPC (General Petroleum Company) facilities, which is owned by Egyptian General Petroleum Corporation, approximately 300 km from the Lagia field. Payments for delivered crude are paid directly to Mena, the Cyprus-based company that holds 100 per cent interest in the field.

Following the successful completion of phase 1, the wells remain on production and SacOil is preparing and planning a second phase of field development and production optimisation to start by June 2015.

This second phase includes the installation of steam facilities for a thermal recovery process on the existing production wells and the drilling of up to five additional thermal wells at the Lagia oil field, with the intention of further enhancing production and the recovery of oil at the oil field.

Dr Thabo Kgogo, SacOil CEO, said this success of the company's development operation at the Lagia oil field is a key milestone for SacOil.

"It marks our transformation from an exploration and production company into realising revenues from the sale of crude oil."

The Infield Systems Ltd. Rig Count tracks industry-wide offshore rigs engaged in drilling and related operations, which include drilling, logging, cementing, coring, well testing, waiting on weather, running casing and blowout preventer (BOP) testing.

FEBRUARY 2015 - OFFSHORE

	FEBRUARY 15	JANUARY 15	VARIANCE	FEBRUARY 14	January 14	VARIANCE
Country	**Offshore**	**Offshore**	**From Last Month**	**Offshore**	**Offshore**	**From Last Month**
ANGOLA	20	19	1	21	22	-1
NIGERIA	16	17	-1	16	17	-1
GABON	5	5	0	5	5	0
CONGO (BRAZZAVILLE)	4	4	0	3	4	-1
MOZAMBIQUE	1	1	0	2	2	0
GHANA	2	2	0	1	1	0
CAMEROON	1	1	0	5	4	1
EGYPT	14	14	0	15	18	-3
TUNISIA	2	2	0	1	2	-1
SOUTH AFRICA	1	1	0	1	1	0
TANZANIA	1	1	0	1	1	0
EQUATORIAL GUINEA	1	1	0	0	0	0
NAMIBIA	0	0	0	1	0	1
LIBERIA	0	1	-1	1	0	1
COTE D'IVOIRE	1	1	0	1	1	0
LIBYA	2	2	0	1	1	0
BENIN	1	1	0	2	2	0
KENYA	0	0	0	1	1	0
MOROCCO	1	1	0	1	1	0
MAURITANIA	0	0	0	1	1	0
TOTAL	73	74	-1	80	84	-4

Source: Infield Systems Ltd.

FES International wins contract from Saipem for Egina project

UK SUBSEA ENGINEERING firm FES International, a global provider of fluid transfer systems, has won a US$2mn contract to supply Bend Stiffener Connectors (BSCs) to oil and gas contractor Saipem.

The BSCs will be used by global energy company, Total, at its third deep offshore development off the coast of Nigeria. The field is currently under development and the production is scheduled to begin by the end of 2017.

The Egina project consists of five dynamic umbilicals and the BSCs will connect them to the FPSO vessel.

FES International provides a range of BSCs to assist the installation of bend stiffeners on offshore deep sea drilling operations. Products are tailored to suit the specific and individual requirements of both the project and the end user.

Rob Anderson, managing director at FES International, said: "We have a successful track-record of working with Saipem, and are delighted to have been chosen by them once again. Repeat business like this is an affirmation of the quality of our products and services.

"We've provided fluid transfer solutions for Total projects all over the world, such as CLOV, Martin Linge and Ichthys and we're proud to be adding this one to the growing list."

FES International has started work on the BSC contract which will be delivered by 17 May 2015.

DeepOcean in Ghana gig

DEEPOCEAN GHANA LTD, a Ghanaian company with 51 per cent Ghanaian-owned share structure, has been awarded a contract to provide the services of a Multi Purpose Construction Vessel (MPV) to Tullow Ghana Limited.

The scope of work for the contract is inspection, survey and subsea construction on the Tullow operated deepwater Jubilee and TEN Fields offshore Ghana. The contract includes subsea tree and jumper installations in approximately 1,100 - 2,000 m water depth. Following the signing of the contract, DeepOcean Ghana is currently mobilising the Rem Forza, a state-of-the-art subsea construction vessel for a six-month charter from March–August 2015, with the possibility of extension into 2016.

Mads Bårdsen, executive vice president international of DeepOcean, commented: "Tullow Ghana Ltd is a strategic client to us, and winning this contract is the first great achievement in the long term strategy for our company in West Africa and specifically Ghana.

"DeepOcean Ghana is supporting Ghana's local content agenda by accelerating participation of Ghanaians in the oil & gas industry and delivering in-country support activities. These include having Ghanaian crew onboard the vessel Rem Forza from the beginning of the contract, ensuring transfer of knowledge and building capacity for the future. DeepOcean Ghana has a strong ambition to develop further businesses in Ghana with Tullow and other clients", Mr. Bårdsen further stated.

The contribution of geophysical ground investigation to the development of onshore oil and gas facilities.

Engineering geophysics in downstream projects

DIFFICULT MARKET CONDITIONS make it seem inevitable that some proposed African downstream oil and gas projects will go no further until prices rise. For the projects that do proceed, however, there will be increased pressure to get things right, to avoid unpleasant surprises and to deliver on time and to budget. Building a reliable ground model and a good understanding of geohazards is fundamental to safe and cost-effective construction and long term operation of a facility.

As part of a well-planned and sensibly sequenced ground investigation, geophysical surveys can make a very significant contribution to the development of oil and gas facilities. And because modern geophysical technology is generally lightweight, modular and highly portable it is well suited to being amongst the first on the ground at remote sites with limited support facilities.

Despite low prices there remains a high level of investment in oil and gas facilities on the African continent. Projections published in the 2014 International Energy Review indicate that investment in oil and gas infrastructure in Africa will be comparable to that in the Middle East (US$2.3 and US$2.6 trillion respectively over the next two decades).

Whilst resource productivity, oil price variations and political factors may represent the overriding risks to developments, there is a growing realisation that uncertainty relating to ground conditions can also have a first order impact on major infrastructure developments. Inadequate knowledge of geotechnical conditions or geohazard risk can increase construction cost and can disrupt operations after completion. Reliance on 'traditional' site investigation techniques, based on in situ drilling and probing with associated laboratory based testing of soil and rock samples, can leave an incomplete picture and a need for interpolation (possibly educated guesswork) between known points. Addressing this, a growing number of developers are specifying increasingly sophisticated geophysical surveys as a key element in the site investigation process. In turn, the site investigation industry is bringing new technology and combinations of methods to the table.

Pre-construction seismic survey for LNG plant.

The most significant area of project risk during construction relates to uncertainty in the ground.

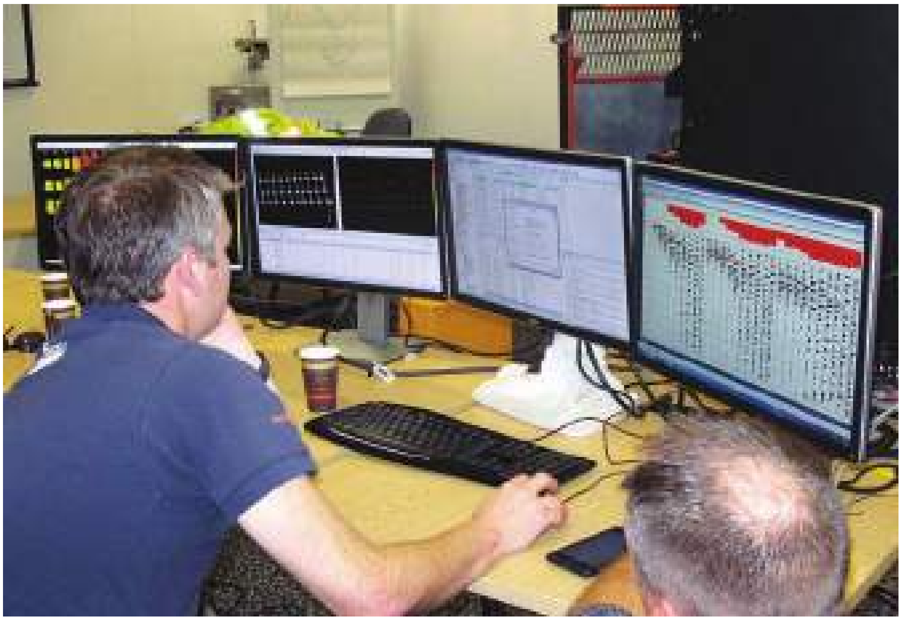
Due to the disparate scale and value of demand between the resource exploration and the engineering/geotechnical sectors, investment in the former has long outstripped that made in the latter. Geotechnical specialists such as Fugro, however, are adept at 'borrowing' acquisition tools and data processing power from the exploration sector and transposing them into scaled down, yet very capable packages for geotechnical scale (typically top kilometre) investigations.

For the last five years, the engineering geophysics team at Fugro has been engaged in significant ground investigations for oil and gas clients in eastern and western sub-Saharan Africa. These projects have generally included integrated bundles of geospatial and geotechnical survey along with associated geo-consultancy.

A common theme and a key element in the success of these projects is the fusion of non-intrusive geophysical and carefully targeted intrusive surveys. Working in this way, clients have been provided with comprehensive ground models characterising ground layering, structure and hydrogeological and engineering properties, together with a workable understanding of development risk associated with geohazards such as active faulting or cavities.

Build the ground model before the infrastructure

The relationship between investment in robust and appropriately timed - usually meaning early - ground investigation and the delivery of projects which are on time and on budget is well documented. Furthermore, it is well recognised that the most significant area of project risk during construction relates to



Data processing power is crucial to 3D seismic surveys which can acquire over 2000 channels.

uncertainty in the ground. The same risks affect most types of development from pipelines, terminals, storage facilities and refineries to associated ports and other transport systems. These can lead to:

- Sub-optimal positioning of key facilities over faults, voids or weak ground, where more suitable conditions were available nearby;
- Design of inadequate foundations due to over-estimation of ground stiffness and uniformity;
- Overdesign and unnecessary expense due to under-estimating ground quality;
- Problems later in the life of the asset such as ground movement due to lack of understanding of seismicity or groundwater.

With most new African facilities being built on previously undeveloped sites where spatial constraints are usually less onerous than in Europe or North America, there is generally some degree of flexibility in siting the downstream facilities. It is therefore prudent to 'design out' possible challenges rather than face the problem of having to 'build-out' of them with heavily engineered (and more expensive) solutions later.

Ground risk comes in many forms: within the context of this article three examples (seismic risk, karstic risk and the challenges encountered in coastal transition zones) are summarised, together with an overview of some appropriate geophysical options.

Seismic risk

Developers of major energy projects must now operate within a different framework following the Tohuku earthquake and resulting tidal wave which devastated Japan's Fukushima nuclear power station. Whilst the consequences of earthquake damage to refining, gas liquefaction and associated facilities may not be as catastrophic as damage to nuclear power plants, it is a significant risk that the industry takes seriously. It is particularly relevant in East Africa with significant levels of seismic activity associated with the East African Rift System. Key geophysical approaches include:

- 2D and 3D seismic reflection methods to characterise stratigraphy and structure including faulting for seismic hazard studies;
- Surface wave seismic methods to characterise lateral and vertical variations in soil stiffness across a proposed development site;
- Borehole geophysics for detailed correlation with known geology and physical properties;
- Use of high resolution seismic sources such as vibroseis and receiver arrays to maximise resolution (geological detail) in seismic images.

Karst, cavities, weak ground

The construction of any downstream infrastructure in areas of geology prone to karstic solution can be affected by significant and highly unpredictable variations in the stiffness of soil and rock at shallow to medium depth. Together with the possible presence of open cavities, this poses a significant risk to the construction of foundations and the stability of surface structures.

Identification of such unpredictable variations or discrete features by drilling or probing alone can be like seeking a needle in a haystack. A more effective approach can be to take advantage of the rapid coverage and high sampling density of geophysical techniques to screen a site before selecting hotspots for verification by intrusive investigation.

Key geophysical options in this scenario include:

- Microgravity to map variations in ground density related to dissolution features;
- Resistivity tomography to map variations in electrical properties related to dissolution features;
- High-resolution multi-component 3C seismic technique for detection of features through scattering / diffraction analysis.

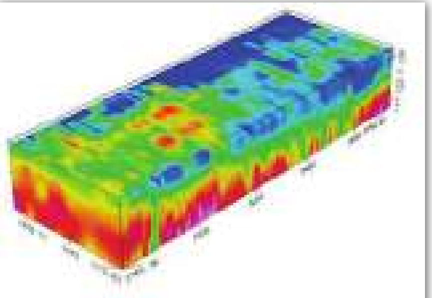
It is in the area of seismic data collection and processing that engineering geophysicists have gained most from the technology and skills developed in the exploration arena. Fugro has just invested in a wireless seismic system capable of running more than 2000 channels to acquire comprehensive 2D and 3D datasets. With a range of acoustic sources and the benefit of oilfield data processing protocols providing high resolution at depth, the system can be used efficiently at sites with difficult surface terrain to illuminate cavities and geological structure that would probably have remained undetected with any other approach.

Transition zone challenges

The interface between land and water represents a range of challenges in terms of reliable site characterisation. Site investigations in the coastal transition zone require the fusion of marine and land-based surveys.

Historically there has often been a data gap where water levels are insufficient even for shallow draft survey vessels to work effectively and where surf, tides and soft mud or sand prevent drilling or other vehicle-based surveys. This gap can have a significant impact on oil and gas developments because it leaves designers of pipelines, jetties and other coastal facilities

Coastal transition zone seismic survey.



Ground stiffness plot derived from surface wave seismic survey.

guessing about the ground below or adjacent to their structures.

In recent years the range of geophysical options for use in this challenging intertidal zone application has grown to include:

- Rapid walkover surveys of near surface (to 5m depth) using magnetic and electromagnetic methods to map buried objects such as utilities, unexploded ordnance or unrecorded foundations;
- Shallow profiling using high resolution techniques including electrical resistivity tomography, surface wave seismic, refraction seismic and reflection seismic.

Most of these can be conducted by teams working on foot, sometimes with the support of low ground pressure vehicles to reach as far as the low water mark in order to maximise overlap with marine based methods.

Post development

Whilst the biggest site investigation investments will invariably be made at the start of a project, there are situations where information is needed later in the asset lifecycle. Factors that can stimulate the need for information mid-life or later include:

- regulatory or cultural changes, such as the post-Fukushima transformation of attitudes to seismic risk modelling;
- a change of use or plant upgrade may require the evaluation of geotechnical parameters such as the adequacy of foundations or the mapping of buried utilities;
- transfer of ownership may require ground investigations as part of the due diligence process.

Summary

Developers understand that most construction risk lies in the ground. Compared to traditional approaches based on drilling and excavating holes and taking an educated guess at the continuity of conditions in the intermediate gaps, geophysics can yield a better understanding with less operational disruption and lower risk in terms of safety and environment. ■

Author: Simon Brightwell, Fugro geophysics marketing manager: Africa Caspian Europe.

High pressure surface debris filter unit

IT IS ESTIMATED that debris—everything from iron scale to cement chips to workers' gloves—in the wellbore during and after completion operations accounts for more than five per cent of downhole tool failures in the Gulf of Mexico. Globally, the percentage is even higher.

Tool failures can cause time-consuming and costly trips, the loss of production zones, or, in some cases, the loss of an entire well.

"The cost of catastrophic failure is never greater than during completion operations," said Mike Adkins, Baker Hughes completion fluids product line technology manager. "To guard against these incidents, Baker Hughes has designed a versatile, unique high-pressure surface debris filter unit that removes solids from completion and fracturing fluids, and protects downhole tools and equipment by keeping the fluids free of damaging debris."

"The unit can reduce the rate of downhole completion tool failures caused by debris, minimising the likelihood that wellbore debris will diminish production or cause downhole tool failures," added Patrick Thibodeaux, senior operations manager. "The system connects directly to the rig's standpipe manifold, downstream of rig tanks and high-pressure pumps."

The unit works in land, shelf, and deepwater environments, and can operate safely and efficiently in applications up to 10,000 psi (690 bar), providing protection from potentially damaging debris during high-pressure pumping operations. In deepwater operations, an additional unit can be connected to the boost line to remove debris before it is pumped into the riser.

Each unit is operated by a trained Baker Hughes employee who can also do maintenance and repairs when needed.

"Designed and built for use in the Gulf of Mexico, the unit has received a lot of great feedback from operators there, and it has the potential for applications globally," added Jacques Camel, fluids filtration supervisor.

Enchancing oil recovery techniques

BP IS NOW operating the world's first robotic coreflooding system. The Core Flood Robot is the most recent addition to BP's programme of enhanced oil recovery (EOR) research facilities.

Coreflooding is one of the most important techniques used to identify and evaluate EOR technologies. It measures the effectiveness of water or gas injected into an oil-bearing rock sample to displace oil. This can be used to assess the potential for water flooding in an oil field.

"The EOR technologies being developed by BP are vitally important to help increase global oil supplies," said Ahmed Hashmi, BP's head of upstream technology. "We believe this step-change in our core-flooding capability will hugely improve the speed and efficiency with which we can deploy new technologies to recover more oil from reservoirs."

BP has had a large-scale in-house coreflooding laboratory in the UK for many years, where reservoir samples can be tested at high pressure and temperature 'reservoir conditions,' and different reservoir types can be evaluated. The new robotic coreflood system operates for 24 hours a day, seven days a week.

The complete automation and work-flow optimisation in the new Core Flood Robot enables hundreds of coreflood tests to be performed each year, rather than dozens as in the past, and greatly enhances BP's ability to evaluate a continuous stream of new EOR technologies. This should reduce the time spent developing new technologies by at least 50 per cent.

The Core Flood Robot is operated by the same team that developed LoSal EOR, BP's breakthrough reduced salinity waterflooding technology. More than 45 coreflood tests were performed in validating the LoSal EOR effect, before field trials in Alaska.

World's first hydraulic pipe recovery tool

CHURCHILL DRILLING TOOLS has launched the revolutionary HyPR (Hydraulic Pipe Recovery) system for the rapid and cost-effective recovery of stuck pipe.

Stuck pipe situations cost operators hundreds of millions of dollars a year in wait times. The HyPR tool can cut that cost significantly by enabling operators to get back on track much more quickly.

HyPR was developed following extensive collaboration between Churchill Drilling Tools, deepwater and Gulf of Mexico drilling teams since 2013.

When drilling challenging wells, stuck pipe situations can be a costly interruption, incurring mobilisation wait times and uncertain recovery attempts and delays.

The HyPR tool offers the simplest method to recover the drill pipe rapidly and to begin side-tracking right away. It also delivers a clean cut for operators wanting to maximise BHA recovery options.

The HyPR system consists of a robust full strength sub, strategically positioned in the drill string. It is severed in around an hour by launching and pumping through a HyPR jetting dart, which lands inside the sub.

The dart takes only a few minutes to arrive and, with a relatively short period of pumping, will part easily under a small loading, simultaneously producing a perfect fish-neck for subsequent operations.

The expected mode of use is to set a kick-off plug, before coming out of hole with the recovered pipe. However the system also provides excellent jarring and internal wireline access for further recovery operations.

The HyPR tool comes in a range of sizes and connections to suit any drill string configuration. It is a natural partner to Churchill's highly successful DAV (Dart Activated Valve), which can be positioned below to allow circulation to first be regained in pack-off situations. It is also compatible with a wide range of drilling jars.

The system contains no explosives or high energy sources and no specialist equipment or personnel are required. The cost-saving benefits are significant for most programmes; however it is particularly useful in expensive or remote locations where external assistance is more costly to mobilise.

Revolutionising the use of fibre optics in oil and gas industry

OPTASENSE, PROVIDER OF distributed acoustic sensing (DAS) OptaSense, at the recently held ADIPEC, introduced the new technology of fibre optics, until now used in the telecommunications industry, into oil and gas wells.

The DAS technology utilises fibre optic cable which acts as a distributed microphone, with high spatial resolution over long distances.

The DASHFP (hydraulic fracture profiling) service is used within hydraulic fracture operations where OptaSense technology not only improves the operational efficiency of hydraulic fracture stimulation but also provides a real-time monitoring capability to verify well integrity.

David Hill, CEO at OptaSense, revealed, "The idea is you install fibre optics within the well, either on casing or on the production string.

Listening to the sound inside the well will give you an idea of what is happening there. When the well comes on to the production, the fibre can provide the status of the oil and gas flow. We can also evaluate the well using the same fibre and interrogation equipment. We can take images of the sub-surface, which allows us to evaluate how the reservoir is developing over time."

The OptaSense DAS system directly measures and monitors the performance of wells from head to toe in real-time. The system also detects, localises and characterises barrier failure, apart from fluid communication behind casing, casing collapse, and leaks through or between casing strings through pressure drops and temperature change, which are unnoticed by conventional monitoring methods.

Technology

Oil prices may be down but the maritime industry is certainly not out in Africa's busy offshore sector.

Africa's emerging maritime trends

THE SHIPPING AND marine industries continue to expand and evolve in support of Africa's dynamic offshore sector. This means ongoing technology advances and efficiency improvements right across the board, from safety and security, through to storage and propulsion. It's driven by ongoing investment in Africa's offshore industry.

Of course, the oil price slump means not all projects will go ahead, at least for now, but there's still plenty to look forward to as Africa's offshore industry evolves.

Big producers like Nigeria and Angola, as well as those in North Africa, continue to attract offshore spending, while there is escalating activity too in new territories such as Sierra Leone and Liberia.

The emergence of an east African deepwater gas province is another exciting development.

All this means international service providers and offshore drillers have extended their presence in the regional Africa market in support of the oil companies and their activities.

Foreign players such as Topaz Energy and Marine, a leading offshore support vessel firm owned by Renaissance Services of Oman, has been quietly building up its West African fleet in recent years in response to this demand.

It is joined by many others, from offshore drilling specialists through to offshore supply and logistics companies.

Local involvement

One important trend is the advance of indigenous maritime companies, in an area typically denominated by international names.

The Norwegian ship builder Havyard recently delivered the African Inspiration to Marine Platforms in Nigeria.

In Nigeria, this is part of the initiative to involve more local firms in the oil and gas industry, including the technically more demanding offshore environment. Nigerian shipping firm Marine Platforms Limited is another to build up its fleet in support of the country's brisk offshore business. Norwegian ship builder Havyard recently delivered a new subsea support vessel, the African Inspiration, to the Lagos-based company. The Nigerian firm offers well services, deepwater subsea solutions and the leasing of ships for various offshore assignments.

When the contract was signed in 2013, many years had passed since the last time a Norwegian shipyard had delivered a vessel to an African shipping company. But Marine Platforms - which also has an operations base in Port Harcourt and a technical office in Aberdeen, Scotland - has been busy securing vessels with other Norwegian shipping companies too.

The latest Havyard 857 Subsea IMR (Inspection Maintenance and Repair) ship is 113 metres in length and will be used for installation, maintenance and repair work on oil installations on the seabed.

African capabilities

The emergence of indigenous shipping and marine industries is visible elsewhere too.

South Africa's docks have become important hubs for the energy industry as well, engaged in repairs and maintenance work.

With foreign investment, more modern vessels are also being built at places like Damen Shipyards Cape Town, now a part of one of the world's leading shipbuilding groups.

Currently, the local yard can build vessels up to 60 metres in length, and has produced tugs,

Petrofac wins two deals with Algeria's Sonatrach

PETROFAC HAS WON two strategic services agreements with Algerian state-owned oil firm Sonatrach.

The first deal is for a five-year contract in which Petrofac will provide a range of multi-discipline engineering design and procurement services in support of Sonatrach's upstream hydrocarbon development programme. Petrofac said it anticipates the contract will cover the early definition of new projects, detailed engineering and services in support of project execution. Approximately 100 personnel will support the contract throughout its duration.

The second agreement sees Petrofac and Sonatrach commit to establish an Algerian joint venture to undertake engineering and project execution of selected upstream and downstream developments. The JV is expected to be finalised by mid-2015, with first project activity during the fourth quarter of this year.

Craig Muir, managing director of Petrofac's Engineering & Consulting Services business commented:"Our track record in Algeria extends more than 15 years and over that time we have had the opportunity to undertake many different types of work. From EPC [engineering, procurement and construction] projects at one end of the spectrum, through operations and maintenance and engineering services, underpinned by our strong local technical training capability."

Working at Damen Shipyards in Cape Town.

Offshore ports are the way forward - Khalifa.

research vessels, modular barges and pontoons.

It recently completed two FCS 5009 patrol boats, the first of their kind to be built locally. "This continues our policy of building in Africa for Africa," said Friso Visser, Damen's sales manager Africa.

He said the versatile patrol boats have consistently shown themselves to be an ideal solution for patrolling an EEZ (Exclusive Economic Zone). This is especially important in areas where there are densely packed maritime boundaries and with lots of oil and gas about, such as the prolific Gulf of Guinea.

Experts are predicting a rise in offshore disputes as the industry pushes out into ever deeper waters, both in West Africa and in eastern Africa.

Most recently, two cases, involving Kenya and Somalia, and Ghana and Côte d'Ivoire, have been referred for arbitration.

Security concerns

Indeed, while safety has always been top priority in the maritime sector, security is now high on the agenda too.

While the International Maritime Bureau's 2014 annual report shows reported global piracy to be at its lowest level in eight years, there's still plenty to watch for, not just off the coast of Somalia, but in West Africa too, where there were 41 reported incidents alone.

Many further attacks went unreported, the IMB says. Five vessels were hijacked, including three tankers, one supply ship and a fishing vessel. In Nigeria, 14 of the 18 reported attacks involved tankers and vessels associated with the oil industry, mostly product tankers. A lot of piracy activity was reported during the year in the waters to the south and west of the Brass oil export terminal.

Vessels were also hijacked in and around Ghanaian waters, while seven vessels were boarded whilst at anchor in Pointe-Noire, Republic of the Congo, another key oil port.

Finding ways to beef up onboard security is likely to be high in the minds of all those working in the offshore industry and in the associated maritime industries. The energy sector is already extremely security conscious, and vessels have deployed armed security guards, but the busy seas off places like Nigeria means policing remains fraught with difficulty.

Offshore ports

One possible solution to some of the problems Africa faces, from bottlenecks to security, is the development of offshore ports, which already exist in other parts of the world.

With a limited amount of coastline suitable for deepwater ports, it could make sense to bring the port out to the ship, many experts argue.

Similarly, floating LNG (liquefied natural gas) or FLNG ports, have long been mooted by the energy industry, but have taken time to develop because of the complexity and safety considerations. That looks set to change after Golar LNG signed a December agreement with upstream operator Perenco and state firm Société Nationale de Hydrocarbures (SNH) for the development of an FLNG terminal 20 km off the coast of Cameroon.

The project will process 500 bcf of natural gas from the offshore Kribi fields, to be exported to global markets via the FLNG facility Golar HIlli, now under construction at the Keppel Shipyard in Singapore. Starting in 2017, it will produce 1.2mn tonnes of LNG per annum for export over an approximate eight year period, with liqueified petroleum gas (LPG) for the local market.

In what will mark the first floating LNG export project in Africa, it's a technical leap for all, including Cameroon, which will be joining the small number of LNG exporting nations. The country has struggled for years to find solutions for its stranded offshore gas.

Continued growth

Golar is one of the world's largest independent owners and operators of LNG carriers. It also delivered the world's first Floating Storage and Regasification Units (FSRU) based on the conversion of existing LNG carriers. At the start of this year, the company signed a deal with Nigeria LNG Limited (NLNG) for two time charters, more evidence that business goes on despite the oil price slide.

NLNG is to retire earlier than planned three of its smaller and less efficient LNG carriers in favour of more modern and technically advanced ships.

New innovations in LNG carriers include significant reduction in boil-off and fuel efficiency improvements.

Golar LNG has signed an agreement with SNH and Perenco Cameroon for the development of a floating liquefied natural gas export project located 20km off the coast of Cameroon and utilizing Golar's floating liquefaction technology.

With Africa's energy sector still a showcase for all the latest offshore kit from around the world, expect to see more of this take root among local economies.

South Africa's Nelson Mandela Metropolitan University and the South African International Maritime Institute recently took control of an 11 tonne Wärtsilä 20 engine, which will form the centrepiece of the school's training facility for future maritime specialists.

This remains an international field but Africa's engineers and mariners are learning fast.

Floating LNG ports have taken time to develop...but that looks set to change.

While Africa's refinery capacity remains limited (with just over 50 refineries) compared to many other parts of the world, the threat of corrosion remains just as pertinent, particularly in relation to the older plants. Kjell Wold, Emerson Process Management, looks at some of the challenges and solutions.

Tackling corrosion in Africa's refineries

WHETHER IT IS in cooling water systems and side-streams, desalting units, flare systems or distillation units, corrosion has the potential to have a significant impact on African refinery operations, bringing risks to the integrity and safety of plants and rising maintenance costs. The Saudi Aramco Journal of Technology, for example, estimates that 36 per cent of maintenance costs in refineries are linked to corrosion remediation and repairs.

Uncontrolled corrosion over time also increases the chances of accidents and unplanned shutdowns.

In this article, we will examine the different forms of internal corrosion and the specific challenges they pose as well as the corrosion monitoring solutions designed to address them.

Different types and challenges of corrosion

There are many different types of corrosion African refineries are vulnerable to. These include general corrosion in carbon steel lines and vessels; localised corrosion in stainless steel units; and naphthenic corrosion in distillation units. Such types of corrosion issues can also vary according to the age of the refinery, its design specifications, and the quality of the crude that is being processed. In addition, changes in operational temperature and velocities can also influence plant performance and corrosion.

Internal corrosion also depends on the service of the pipe/vessel and the materials used. Carbon steel piping within the refinery, for example, will suffer from uniform corrosion, depending on water content, the efficiency of desalting, and the use of corrosion inhibitors. This will also be the case in many of the refineries' early streams, side streams and cooling water pipes.

Another common problem in high temperature distillation units is 'naphthenic corrosion', that normally initiates itself as localised corrosion attacks but which may later form front lines where the localised attacks develop into larger attacked areas. Over time, metal loss will appear through a combination of localised corrosion and more uniform distribution at the internal pipe wall.

Finally, the quality of the feed (crudes) can also affect corrosion in the plant. Different crudes have different corrosion properties, linked to the 'acid content' of the crude (TAN number). As acid content is linked to the crude price and lower price crudes often have a higher acid content and are more corrosive to the plant materials, refineries that buy crude in the spot market (opportunity crudes) often need a proactive corrosion protection strategy. This strategy must be related to the blending of crudes, material selection, monitoring and inspection.

There are many different types of corrosion African refineries are vulnerable to - the Sapref refinery in Durban.

Different crudes have different corrosion properties, linked to the 'acid content' of the crude (TAN number).

So given these challenges and the different types of corrosion, what strategies and solutions are in place to address corrosion in African refineries today?

Probes and ultrasonic sensors

One of the most common corrosion monitoring technologies used in refineries today are intrusive probes and coupons. In refineries, retractable style probes are most commonly used - in particular, Electrical Resistance (ER) and Linear Polarization Resistance (LPR) probes. Typical locations for these probes are in side-streams, low temperature process piping and heat exchanger inlets with Emerson providing transmitters for both ER and LPR probes (see figure 1).

Figure 1 - Emerson's CorrLog wireless corrosion transmitter for ER and LPR probes.

ER probes are based on measuring changes in the resistance of the probe's measurement element. As the metal element corrodes, the thickness is reduced and the resistance increases. Reference elements inside the probe are then used to compensate for temperature fluctuations.

ER probes' advantage is that they have a high resolution (down to 10s of nano-meters of metal loss) and hence the response to changes in corrosion rates is fast. ER probes can also be used in most environments (oil, gas and water) and are available with a high temperature rating.

The disadvantage of ER probes, however, is that they are intrusive and that the measurements are local. The probe is therefore most likely to be useful if the corrosion is uniform and it is often difficult to pick up localized corrosion with an ER probe.

LPR probes are based on calculating the current response to a small polarisation of the probe's working electrode in a two- or three- electrode configuration. The corrosion rate is proportional to the current response measured and corrosion rates can be determined from only one measurement.

Due to their high resolution and fast responses, intrusive probes are important for active corrosion management as well as the verification and optimisation of corrosion inhibitor use. The use of intrusive probes should be avoided, however, in cases where internal composition is chemically aggressive, such as in alkanising unit side-streams. For such locations, non-intrusive ultrasonic and Field Signature Method (FSM) devices are a good alternative.

Field Signature Measurements

Finally, there is Field Signature Measurement (FSM) corrosion monitoring – a non-intrusive method for monitoring corrosion, erosion, or localised attacks and well suited for high temperature refineries. FSM is most commonly focused on critical applications, such as naphthenic corrosion monitoring at high temperature distillation units. A typical location of FSM in a refinery would be mainstream or downstream of the furnace after the apex of the bend.

FSM is based on the feeding of an electric current through a selected section of the structure to be monitored. This is achieved through non-intrusive sensing pins distributed over the areas to be monitored. By inducing an electrical current into strategically located pipe sections, the induced electric current creates a pattern determined by the geometry of the structure and the conductivity of the metal.

Voltage measurements on each pin pair (up to 384 pins can be applied in a matrix) can then be compared to the 'field signature' that provides the initial reference, and changes in the electrical field pattern can then be monitored. Conclusions can thereby be drawn relating to the general wall thickness and the initial signs of metal loss.

FSM's ability to distinguish localised attacks and general corrosion in real-time as well as the ability to detect corrosion rates much earlier than traditional corrosion methods is a significant benefit. This allows corrective action to be taken before any damage occurs and is crucial to African refinery operators in preventing any shutdowns.

> Corrosion remains a continuous challenge in African refinery operations today.

The rise of online corrosion monitoring

Whereas traditional corrosion monitoring is carried out via corrosion coupons, where a portable meter interprets probes off-line every two to four weeks, refinery operators today require access to frequent, real-time data for optimised trending and process correlation.

In the case of Emerson's FSM solution, for example, we have introduced an on-line system and on-line data logger used with a wide range of wireless communications solutions. The result is higher data collection frequency, thereby increasing the accuracy of the system; and an online system which allows remote and wireless data communications direct to the operators' offices.

The plot below, for example, (see figure 2) illustrates how online FSM data is used to optimise corrosion inhibitor control in a case where the refinery is processing opportunity crudes. It illustrates how inhibitor dosing is related to changes in corrosion rates, and how a different TAN mix of crudes has an effect on the corrosion in the distillation units. The first period is used to create a good baseline for the monitoring, and later data is used to optimise the mix of opportunity crudes.

Furthermore, the growing acceptance of the WirelessHART communications standard has allowed the online upgrading of plants at an affordable cost. This enables different monitoring functions to be integrated within the same wireless network. The more applications there are, the better it is, since communication goes in a mesh where the signal is routed in the most convenient way between the WirelessHART transmitters to the gateway.

At Emerson, both intrusive probes and ultrasonic devices are available within the WirelessHart infrastructure, allowing for the combining of different monitoring technologies within one integrated WirelessHART system.

A new refinery probe

For all the benefits of today's corrosion monitoring solutions and their recent technological developments, however, limitations still remain, such as a lack of integration between different corrosion monitoring infrastructures and limited communications options. This also comes at a time when African operators are more actively focusing on corrosion and integrity management.

It's with this in mind and building on previous technology developments that Emerson has developed a new refinery probe-based system that integrates seamlessly with existing monitoring systems.

The system consists of high quality ER and LPR probes as well as weight loss coupons - devices where pre-weighed steel samples are inserted into the pipe or vessel for a given period, then cleaned and weighed after retrieval.

ER and LPR monitoring functions are also available on the same instrument and a 20-meter cable provides added flexibility with respect to positioning, optimised signal routing, easier maintenance and probe replacement. The system also has high resolution and fast response rates – so important for efficient corrosion inhibitor control.

The system also comes with advanced wireless capabilities and is compatible with the WirelessHART protocol as well as other Emerson data management software.

Finally, the system is part of a complete asset integrity solution and works alongside FSM and Emerson's Rosemount P/T transmitters and repeaters.

The result is a simplified, flexible wireless-based corrosion monitoring system that operates effectively across the asset and reduces maintenance costs. The new probe-based system was recently deployed on a Polish refinery where the high resolution allowed for the observation of fast moving corrosion trends with corrosion rates increasing to 65 micrometers within just 14 days.

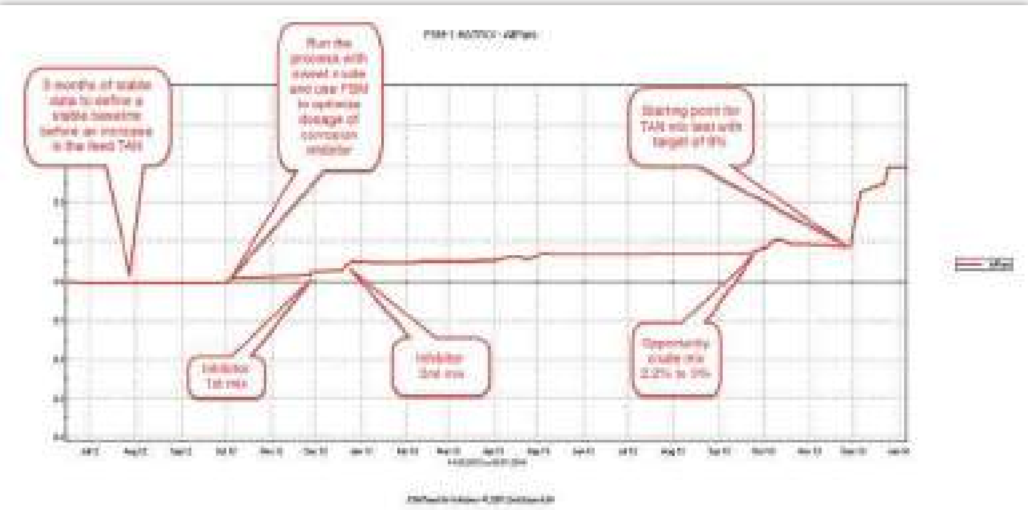
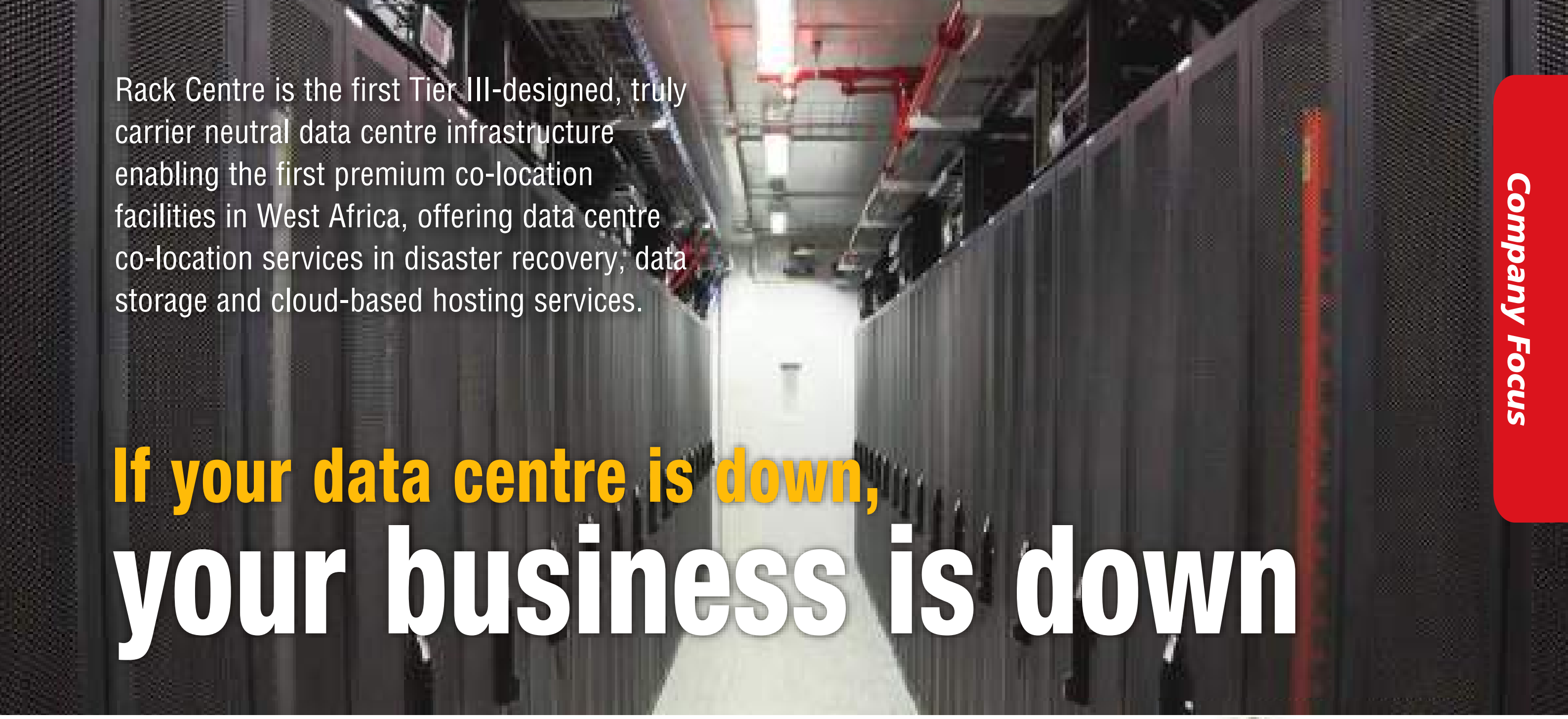


Figure 2 – An example plot for how online FSM data can be used to track and optimise the use of corrosion inhibitors when processing opportunity crudes.

A continuous challenge

Corrosion remains a continuous challenge in African refinery operations today – not only for maintenance and control but also as a potential risk for people and assets if not properly managed.

In such cases, each refinery must adopt its own monitoring and control strategies to meet their own specific needs. From intrusive probes and coupons, including the new refinery probe, through to the latest Field Signature Method (FSM) developments and WirelessHART technology that is providing a catalyst for integration, African refinery operators are finally starting to get the choices they need when it comes to addressing corrosion challenges. ■



Rack Centre is the first Tier III-designed, truly carrier neutral data centre infrastructure enabling the first premium co-location facilities in West Africa, offering data centre co-location services in disaster recovery, data storage and cloud-based hosting services.

If your data centre is down, your business is down

RACK CENTRE HAS a proven 100 per cent uptime; the technology invested in provides clients guaranteed levels of uptime, power and service availability. Co-locating within Rack Centre allows companies to avoid fixed infrastructure investments and to leave the growing complexity of managing power and environmental issues to specialists.

Why build a data centre when it takes millions of US dollars to build an efficient data centre, a key asset, but non-earning asset.

As a truly carrier-neutral facility, Rack Centre has multiple telecommunication connectivity service providers, such as Broadbased, MainOne, MTN and Vodacom. This allows its clients the flexibility of connectivity choices from various ISPs and also provides a robust connectivity redundancy and resilience in Rack Centre.

The Internet Exchange Point of Nigeria (IXPN), Nigeria's leading internet exchange point is also connected into Rack Centre, making Rack Centre the only carrier neutral co-location data centre in Nigeria providing a platform for Nigerian Internet Service Providers (ISP's), exchanging traffic at a lower cost and resulting in an improved quality of service through lower latency and high performance.

The managing director of Rack Centre, Ayotunde Coker, commented: "Rack Centre is a quality, carrier neutral facility that intends to keep raising the bar for data centre providers in Nigeria with a string of firsts; first to be Tier III design certified, first carrier neutral Tier III site and now the first Tier III data centre to sponsor and establish an Internet Exchange Point".

Rack Centre's energy-efficient data centre cooling technology offers the lowest Power Usage Effectiveness (PUE) of 1.5 vs industry standards of 2.5. This is achieved through the implementation of an advanced air optimiser which is a sophisticated mechanical cooling and building management system. The cold isle doors have a patented automatic louvre technology which matches cooling to server demand. This contributes to environmental sustainability and lower energy costs.

Ideal location

The Rack Centre facility is ideally located in Oregun with easy access to the main commercial areas of Lagos and is situated on a 20,000 sq m green field private estate. The data centre site is 30 metres above sea level, one of the highest points in Lagos.

The Rack Centre facility is ideally located in Oregun.

Ayotunde Coker managing director, Rack Centre Ltd.

Uncompromised security is a crucial requirement and Rack Centre is within a private estate secured by manned guards with world class ten levels of physical security, and offers comprehensive perimeter and building security with biometric verification and extensive CCTV, all of which is recorded and archived.

Rack Centre's vision is to be the leading data centre in sub-Saharan Africa; delivering robust co-location services to world class standards. Within a short period of time, Rack Centre has been recognised as the premium data centre facility in West Africa offering reliable service and appreciated for having the most competent and highly motivated personnel in the industry.

Awards

Finalist and only African company nominated in the Data Centre Dynamics Awards for Europe, Middle East and Africa (EMEA) Region for 2014. The Data Centre Dynamics Awards recognise innovation, leadership and best practice in the global data centre industry.

Achieved Leadership and Governance award from The Institute for Government Research Leadership Technology. ■

Rack Centre is 100 per cent owned by Jagal, a Nigerian conglomerate holding that operates leading energy businesses and manages a diverse portfolio of investmentsNigerian conglomerate.

Once in production, the digital oil field of today provides round-the-clock monitoring, ensuring optimum performance. However, intelligent wells are only as clever as the technology that surrounds them.

Smart, intelligent wells for optimum performance

LIKE MOST PARTS of the oil and gas business, drilling has gone very high tech. Intelligent wells - ones that include a vast array of computer sensors, and other gadgets - give split second feedback to drillers, providing vital insight and information at the touch of a button, via a PC monitor.

In such a high cost environment (oil wells never come cheap) it's a valuable advance for operators and all those involved, including any nervy investors back home.

Yet intelligent wells are only as clever as all of the technology that surrounds them.

It has given rise to the age of the digital oil field, an umbrella term for all and any technology-centric solutions that permit companies to leverage limited resources.

And, once in production, the digital oil field of today provides round-the-clock monitoring, ensuring optimum performance, at least that's the theory.

Although it is still people that man the machines, the international energy industry is underpinned on all fronts by modern digital technology.

This is what makes it possible to find and extract hydrocarbons deep at sea and in other challenging locations.

Africa's oil and gas industry has been great at pushing the frontiers here, transforming deepwater Angola and Nigeria into world-class oil provinces.

Intelligent wells are only as clever as all of the technology that surrounds them.

It also makes things possible that may once have been deemed impossible.

Finding oil in landlocked Uganda, for instance, was dismissed by some as folly not that long ago; and yet now we know there is plenty of oil and gas locked away in underground reservoirs.

Research and development

Behind these success stories, and often grand undertakings - no one can fail to be impressed by the sight of those mighty offshore rigs - are international companies that push the frontiers every day back home in the laboratory.

Research and development spending on new oil drilling technologies of all kinds is immense, but merited given the potential scale of cost savings to be made out in the field.

Among other advances, it has spawned a wave of new directional and horizontal drilling techniques, all controlled by technology, that has made finding previously out-of-reach resources accessible.

The world's biggest driller, National Oilwell Varco (NOV), has wholeheartedly embraced this technological revolution.

It recently unveiled the newest addition to its 'Ideal Rig Series', an initiative aimed at overcoming today's drilling challenges through continual innovation.

Its Ideal Prime Rig is packed out with field proven innovations in land rig technology, such as a more powerful top drive and more efficient pipe handling capabilities.

NOV's Ideal Prime Rig is packed out with field-proven innovations in land rig technology.

And yet there is still plenty of room for more in terms of automation, experts reckon.

NOV's vice president of automated drilling applications, Tony Pink, told a recent conference in the Middle East that the drilling business as a mechanical system is still only about 25 per cent efficient.

"If we can get back some of that 75 per cent, we can really increase our performance," he said.

NOV's drilling automation system includes applications for drilling optimisation, such as closed-loop control of drill string vibration, automated steering, control of downhole weight on bit and ECD management.

Data is transmitted through wired drill pipe and to the rig's control systems for real-time operations.

The system also supports mechanical specific energy optimisation, the amount of energy put in versus the amount of energy put out.

Onshore challenges

Africa's diverse landscape means these and other solutions are always welcome.

It certainly presents many unique challenges for drillers, from the swamps of Nigeria's delta region, to the blistering heat of the Sahara desert.

In Algeria, there's plenty of drilling coming up, with a spate of rig deals announced recently, as Algerian state energy company Sonatrach pushes on with big plans.

It plans to intensify exploration by drilling 125 wells a year with a target of increasing production to 225mn tonnes of oil equivalent by 2019, it announced in December.

Last year, German-based rigs and equipment manufacturer, Bentec won the largest single contract in its history to deliver seven desert drilling rigs to Enafor, an Algerian drilling services company, acting on behalf of Sonatrach.

All are to be equipped with Bentec equipment, including top drives, pumps, drawworks, power control rooms and electrical controls.

More recently, Drillmec, part of Italy's Trevi Group, is to provide a series of rigs, including two high powered 3000HP units, again for Enafor. The two 3000HP rigs are specially designed and intended for deep drilling where high temperatures and pressures exist.

Needless to say, keeping cool is always an essential part of the process with any drilling, but especially so in such an environment. US-based Newpark Resources announced a US$350mn contract with Sonatrach recently to provide drilling fluids as part of Algeria's big drilling push.

Offshore challenges

There are different challenges to be faced in the offshore environment, where well integrity, for instance, takes on a whole new meaning.

The cost of offshore operations means intervention is hugely costly, underpinning the need for reliable, dependable and 'fail proof' well technology and other systems.

All of these are vital for the future success and profitability of any well, offshore or onshore.

Regulators and operators alike are constantly pushing for higher quality and stronger structural and casing integrity.

One company, Meta, has scooped an armful of awards for some of its products, including a unique downhole isolation technology, Metalmorphology.

"With the ability to deliver gas-tight, axial load bearing, metal-to-metal seals our technology has redefined what's possible in well integrity and meets these industry demands," says Meta's chief executive Kevin Stewart.

It won an Innovation of the Year Award at the 2014 Africa Oil & Gas Awards in recognition of the firm's contribution to the deepwater and ultra-deepwater drilling sectors.

Massive technology advances have enabled Africa's offshore success thus far and continue to drive exploration efforts further out to sea.

Metalmorphology is the process of shaping metal downhole to provide a metal-to-metal, gas-tight seal for the life of the well.

In other parts of the world, this opens new opportunities too, such as tackling the extreme cold of the Arctic, or in the exploitation of unconventional resources like shale gas, which has boomed in the USA.

Industry consolidation

Mastering all this technology can be a lucrative business.

Schlumberger, the largest international oil services group, recorded profits of US$7bn on revenues of US$45bn in 2013.

These are challenging times though with a number of leading drilling and service companies teaming up as the oil price environment puts pressure on margins.

Industry consolidation is on the up, following the US$38bn Halliburton and Baker Hughes tie up, and with Technip making a move for fellow French firm, CGG.

General Electric is also looking to snap up subsea drilling technology from Oceaneering International. It is buying the Subsea Electric Actuator product line, which focuses on electric valve actuators, which are fitted to the subsea flow control systems.

There is a possibility that weaker oil prices could dent research spending, although, on the flip side, consolidation could improve cost savings and economies of scale.

Whatever the year brings, drilling technology - from data monitoring, software and modeling, through to waste handling and environmental management - is here to stay. ■

Creating a mobile worker with ComPro+

OFFSHORE COMMUNICATION IS, and will always be, challenging. More and more Ex gadgets are flooding the market, such as Ex smartphones and Ex tablets. These devices by themselves won't solve the problem. To utilise them you'll need your own private offshore GSM network.

The network, ComPro+, will be set up at your facility and will cover 90 per cent of the area, above and below deck. It can be as basic or as elaborate as you need and will provide you with all means necessary to create your mobile worker.

You can set up the system to provide mobile communication through voice (telephone) and data (sending emails, documents, photo's, video, etc). Everyone carrying a device will be 100 per cent reachable, including for the outside world when ComPro+ has been connected to the rig telephone system.

You can add numerous options to personalise communication as you see fit: eg, there is a man-down option, the system can be connected to your fire & gas detection system and tablets can be added to facilitate paperwork being handled on the spot, saving valuable time in trips to the office.

To make sure ComPro+ is used to its fullest potential, it has been combined with an Ex Zone 1 certified smartphone, SmartPro Tough, and it's big brother, TabletPro Tough, an Ex IP68 and Zone1/Zone2 certified tablet. Being Android devices they can easily be connected to your existing systems, making the most of your offshore communication and creating your mobile worker.

New well integrity service

SCHLUMBERGER HAS RELEASED its Invizion Evaluation well integrity service, which helps operators evaluate zonal isolation by using integrated drilling, cementing and well logging data.

"One key component in achieving zonal isolation is cementing, which can impact productivity, help prevent sustained casing pressure and annular flow, and mitigate loss of well control issues," said Amerino Gatti, president, Well Services, Schlumberger. "The Invizion Evaluation service combines all available data from open hole, cementing placement, and acoustic logs for cement evaluation in an integrated workflow. This service supports customer decision making during the well construction and completion phases to help ensure a robust cement barrier."

The Invizion Evaluation service uses real-time and post-job data to help identify zonal isolation issues that could impact well integrity. To perform well, pad or field analysis, petrotechnical experts can evaluate drilling surface parameters, formation rock properties, cement barrier placement, and cased hole cement evaluation logs.

Field tested in a wide range of field locations, including offshore environments in the Gulf of Mexico and Alaska, unconventional wells in Colorado and the Eagle Ford Shale, the Invizion Evaluation service enabled customers to confirm that cement placement was achieved as planned. The service also allowed them to identify zonal isolation issues, understand the reasons the issues existed in the short and long term, and minimise the potential impact on well integrity.

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