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EUROPEAN OIL & GAS

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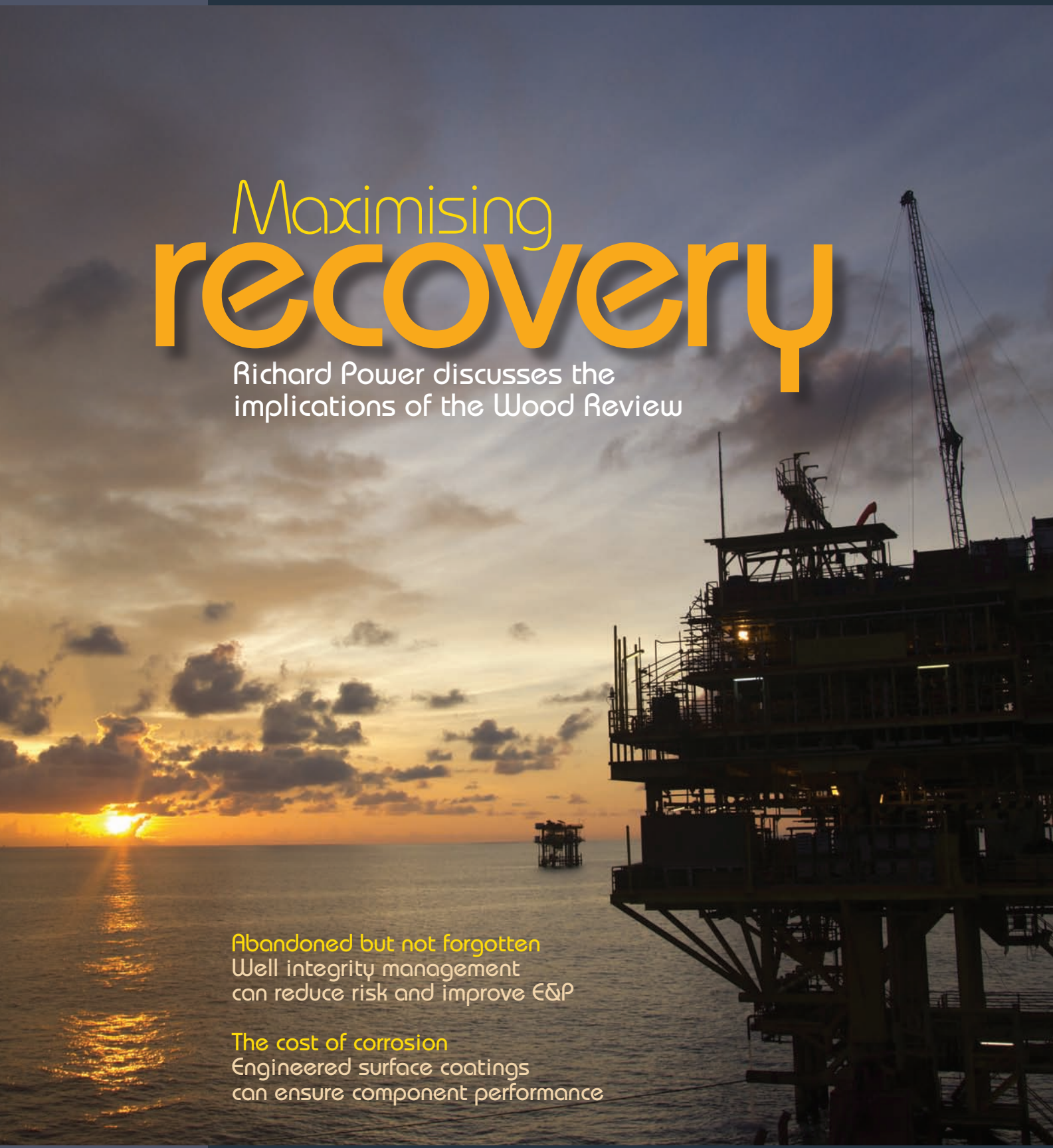
Maximising recovery

Richard Power discusses the implications of the Wood Review



Abandoned but not forgotten
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> "the key to achieving its goals will be the recruitment of suitable skilled personnel, as well as how the various high level issues are put into practice industry-wide"

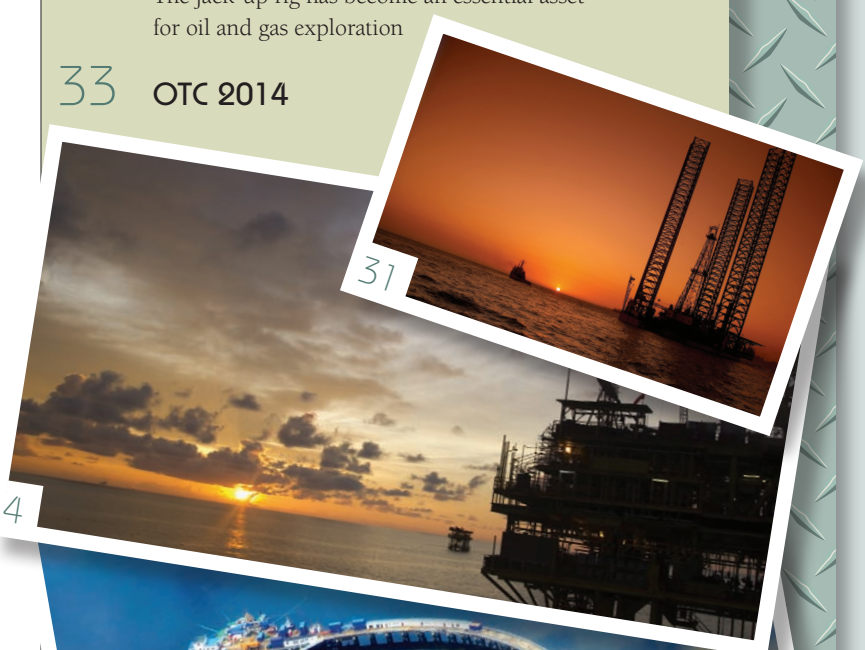
Much has been made of the UKCS being in a pivotal period, reaching peak oil, experiencing declining exploration and facing a number of other key challenges. Recognising this, earlier this year Sir Ian Wood delivered his groundbreaking review on maximising economic recovery (MER) announcing "The UKCS is facing a new set of challenges, which are not insurmountable, but will become more difficult to address if we do not act quickly."

The recommendations, including establishing a new regulator to oversee MER, fostering further collaboration and co-operation, developing sector strategies and encouraging greater commitment from Government and industry, have been met positively by the sector. The oil and gas industry is challenging however, and with that in mind this issue we speak with Richard Power of law firm Berwin Leighton Paisner, who points out some of the complexities in implementing the review.

"As with everything the devil will be in the detail. We have a report with some very high level recommendations and the key to achieving its goals will be the recruitment of suitable skilled personnel, as well as how the various high level issues are put into practice industry-wide," he explains, before highlighting some of the potential issues for consideration. While there is little doubt that the review will bring clear benefits to the industry, Richard's analysis makes it clear that there may be some way to go before we can reap the rewards.

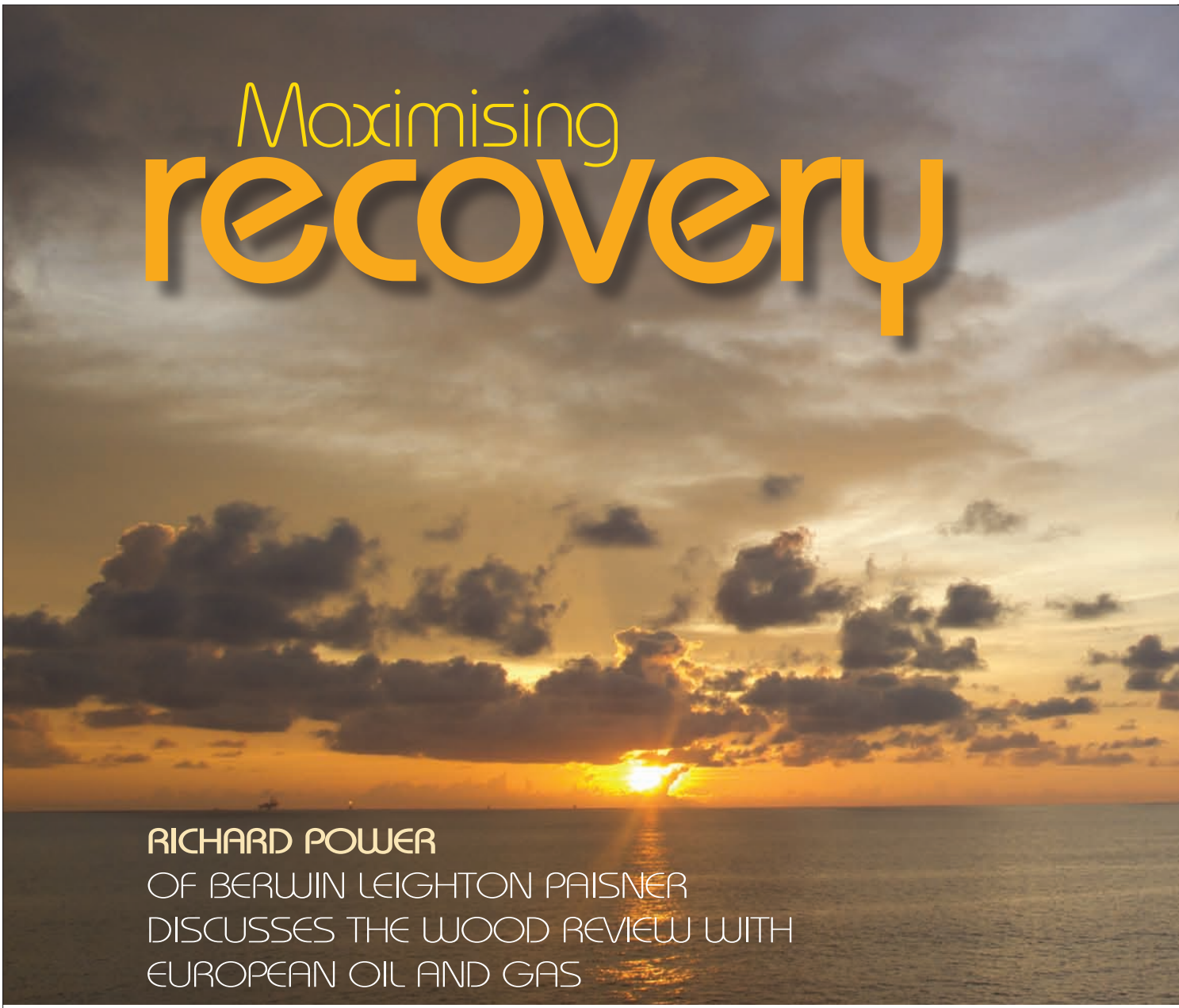
EDITORS LIBBIE HAMMOND & MATT HIGH

Regulars



Profiles

Maximising recovery



RICHARD POWER OF BERWIN LEIGHTON PAISNER DISCUSSES THE WOOD REVIEW WITH EUROPEAN OIL AND GAS

Earlier this year Sir Ian Wood delivered his groundbreaking review on maximising recovery from the UK Continental Shelf (UKCS). Recognising the importance of the national oil and gas industry, particularly its significant contribution to the economy, energy security and long-term employment, the UK Government announced the review in July of 2013.

This was chiefly in line with assessments of the region, which is one of the world's most mature basins, that noted that while some 42 billion barrels of oil and gas have been produced and a further 12 to 24 billion could still be produced, exploration has declined sharply over recent years on the back of a number of key challenges facing the sector. While investment continues and near-term prospects remain strong it is vital that we make the most of opportunities in the sector by maximising oil and gas recovery.

After working closely with a wide range of companies in the UKCS the final review set out a number of clear recommendations for the next phase of UKCS exploration and production, with Sir Ian Wood noting that: "The evidence that I have received has been consistent and clear. The UKCS is facing a new set of challenges, which are not insurmountable, but will become more difficult to address if we do not act quickly. We must strengthen the capacity and capability of our stewardship regime to significantly enhance collaboration across the UKCS if we are to meet the demands of maturity and diversity, and maximise the economic benefits for both the country and the industry."

The review, which has been received positively by the industry, sets out Sir Ian Wood's key proposals for maximising the next phase of the UKCS' oil and gas recovery in a number of recommendations:

- Government and industry to develop and commit to a new strategy for Maximising Economic Recovery (MER) from the UKCS
- To create a new arm's length regulatory body
- That the regulator should take additional powers to facilitate implementation of MER
- To develop and implement important sector strategies – exploration, asset stewardship, regional development, infrastructure, technology, decommissioning

Below
Richard Power
of Berwin
Leighton Paisner

As highlighted, the recommendations have received large-scale industry support, with the Government suggesting that full and rapid implementation could deliver at least three to four billion barrels more than would be recovered without it over the next 20 years, potentially bringing more than £200 billion additional value to the UK economy. However, with an industry as complex as the oil and gas sector, there are likely to be challenges in implementing these recommendations. Chief among these could be the creation of a new regulatory body itself, particularly with the review announcing that the role of the new regulator would be licensing, supervision and stewardship, and that it would remain low on bureaucracy yet high in skills and experience, and strong and pragmatic. It is hoped that the regulator will ultimately aid in establishing a strong relationship with HM Treasury, enhancing exploration programmes, improving E&P performance, tackling spiralling costs, and encouraging better technology.

To further analyse the review *European Oil and Gas Magazine* recently spoke with Richard Power of international law firm Berwin Leighton Paisner LLP. Richard is head of the oil and gas commercial disputes team, which forms part of a wider oil and gas industry focus group within Berwin Leighton Paisner that works on various aspects of the industry, such as transactional and regulatory advice, planning and environment and disputes.

"Looking at the industry as a whole over the last couple of years I think that the review does an excellent job of identifying the key challenges and issues facing the offshore sector in the future," he explained by way of an introduction. "Essentially, the industry remains a major part of the UK economy but there have been concerns that while there have been high levels of investment we have also witnessed decreasing production efficiency, aging infrastructure and obstacles to further E&P from the sharing and optimisation of that aging infrastructure in order to get the oil and gas to market."

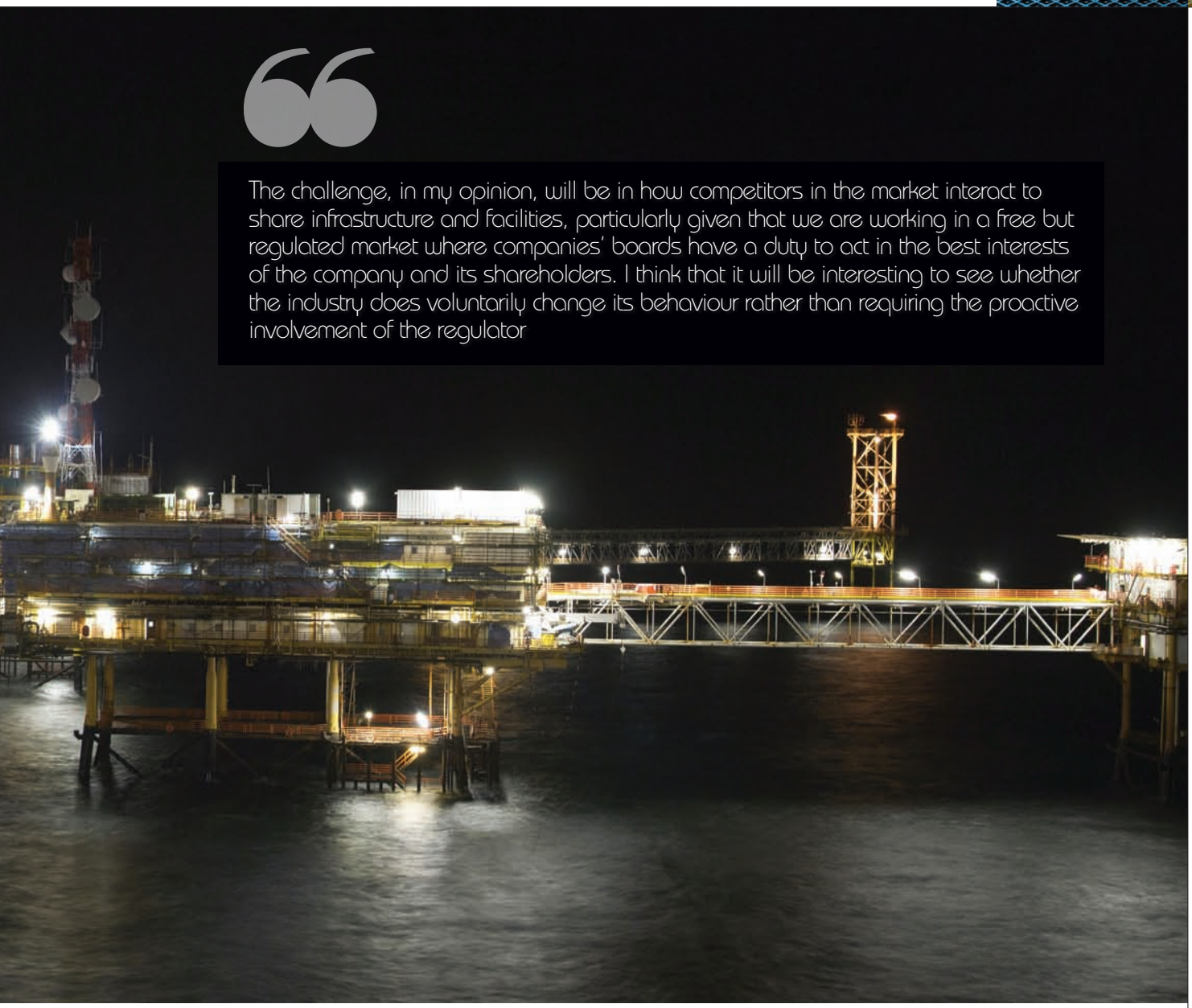
As Richard highlighted, the review has been largely welcomed by the industry, although some of the points may be contested. For example, the formation of a new regulator – which must remain a third party yet be very close to the industry – could prove to be counterproductive and

add extra costs in its funding and operation. The manner in which the regulator engages in commercial disputes could potentially prove challenging, adding additional complications to an already complex industry.

"Primary behind the recommendations is MER of course, and to achieve that you will undoubtedly have to have a well-resourced regulator to oversee that," said Richard. "The challenge will be for the new regulator to implement these high level recommendations in a manner that actually achieves the goals that are set out in the review, and to do so in a cost-effective way that doesn't inadvertently increase the potential for disputes and increase costs, which could ultimately act as a disincentive to investment and new entrants into the market."

Richard was particularly keen to highlight areas around disputes, which he felt could potentially cause issues. "Naturally, the review identifies that disputes are seen as a clear negative to further investment. In terms of the regulator, what is proposed is that disputes relating to matters relevant to a licence or the potential for collaboration should be brought to the regulator for mediation within six months of them arising. The regulator will try to mediate the dispute, and if that doesn't result in an agreement, the regulator can then make a recommendation that isn't binding, but if the regulator decides that the rejection of the recommendation is inconsistent with MER UK it can then impose sanctions.

"As a dispute resolver, the main issue that I foresee with that approach is that, firstly, mediation and dispute resolution mechanisms like this are already available and working very well," he continued. "They are quite often built into contracts, and where they are not and the dispute is subject to litigation in England and Wales, under the Civil Procedure Rules you are actually obliged to consider alternative dispute resolution methods like mediation. This isn't really a new approach, and the potential problem I see is the effect that the threat of sanctions would have on the parties' openness with the independent third party who is assisting them in brokering the deal. For example, if you know that if a deal isn't struck, the third party mediator can go on to make recommendations that could result in penalties, then my concern is that parties will not fully engage in mediation



> The challenge, in my opinion, will be in how competitors in the market interact to share infrastructure and facilities, particularly given that we are working in a free but regulated market where companies' boards have a duty to act in the best interests of the company and its shareholders. I think that it will be interesting to see whether the industry does voluntarily change its behaviour rather than requiring the proactive involvement of the regulator

because they wish to keep their cards close to their chest in case there isn't a settlement of the dispute and they get penalised, partly or wholly on the basis of what they have said during the mediation.

"Secondly, as I've already mentioned, the regulator's involvement in itself could be counterproductive because as well as the already present legal costs of resolving the underlying dispute, you could potentially then have extra levels of costs incurred in interacting with the regulator and making submissions to them and so on. So, the key challenge I think for the new regulator will be to not add extra layers of regulatory burden on top of the already expensive business of resolving disputes."

It remains to be seen how the new regulator will develop and what potential issues may arise in its operation, but there's little doubt it will experience some of the challenges of all regulators. "It has been recommended that the regulator must be proactive to encourage industry participants to co-operate and collaborate effectively, to break the logjam in commercial negotiations and interaction. I think the challenge of all regulators is how to do that with the minimum of bureaucracy and interference, which to me seems like a big challenge. Any additional compliance which is required by a regulator, or requirement on industry participants to deal with the regulator more closely, tends to create an additional financial burden, which should be avoided."

On a wider scale, resolving and reversing financial burdens are another key aspect of the Wood Review, particularly after recent increasing investments but falling exploration rates. One potential contradiction is that while the regulator is expected to tackle spiraling costs, at the same time companies and the industry must fund that regulator themselves. There seems the distinct possibility that this could cause potential issues, especially as the review said it would be sensible for the industry to fund the regulator, while many industry interviewees felt that the Government should in fact pay at least some proportion of the costs. One proposal around this is that in response to paying the industry will be granted appropriate service level agreements that outline the quality of support and delivery they can expect from the regulator.

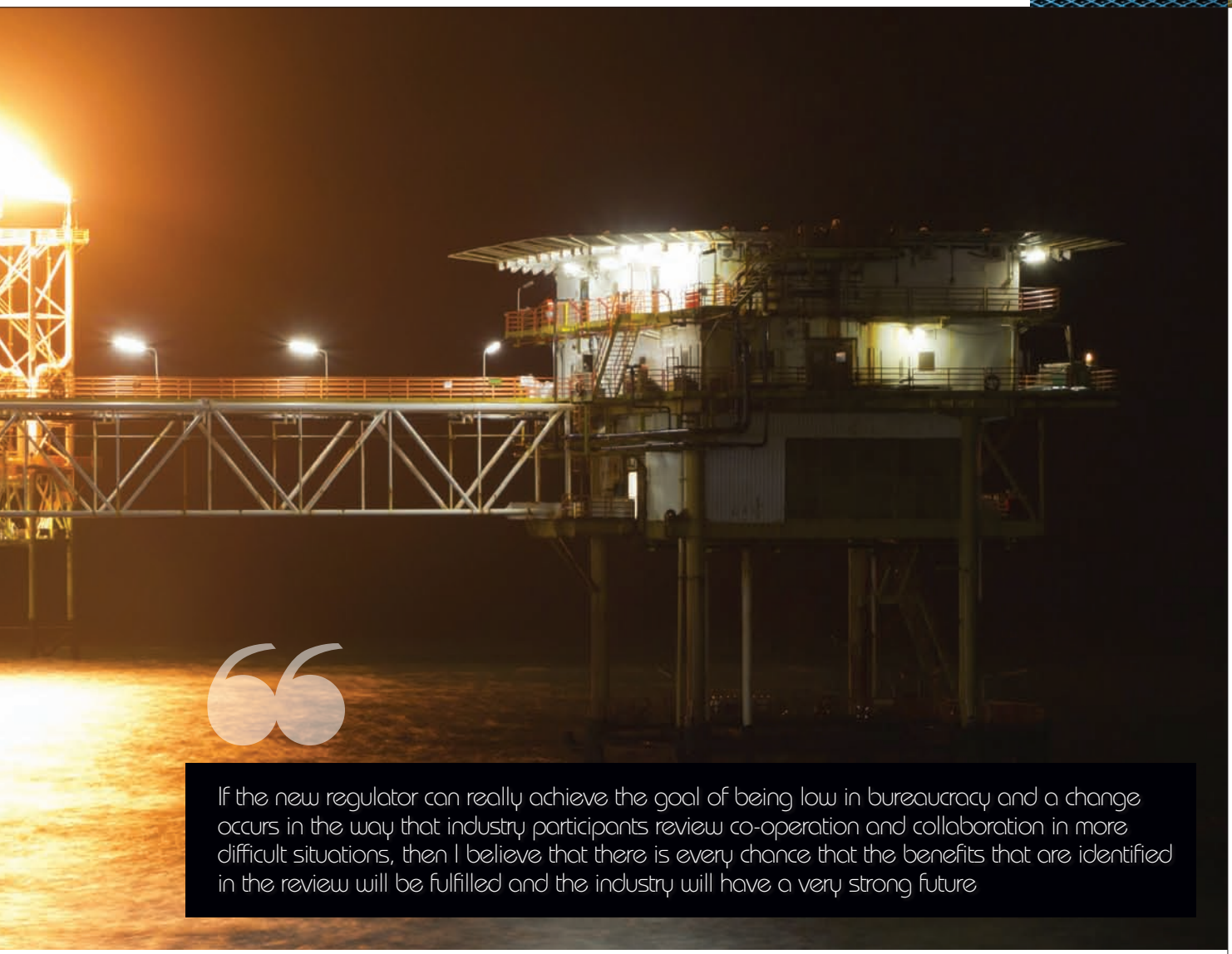
"In my experience as a dispute resolver, this signals to me a further layer of potential disputes and difficulties," Richard pointed out. "For example, if you are funding the regulator and have such service level agreements then what happens if, as an industry participant, you feel that the regulator is actually falling below that level? Of course you can challenge, but this will in itself create a dispute, which just adds further layers of potential problems. There are a number of instances in the report like this, where it is difficult to understand how you achieve one aim without having a knock-on effect on another issue."

One suggestion for MER, particularly in reducing financial costs, is the sharing of infrastructure and a stronger emphasis on co-operation in the industry. This point is interesting in that the industry is already well known for its co-operative and collaborative spirit, particularly as nowadays simple economics make it unlikely that there are many businesses capable of exploring, extracting and bringing to market without the need for co-operation. "Sir Ian Wood notes that 'interviewees take a more constructive approach to risk as between the supply chain than they do with competitors in the market', and I think that is the key issue - people will naturally co-operate within the supply chain because there is a shared interdependency there," Richard explained.

"The challenge, in my opinion, will be in how competitors in the market interact to share infrastructure and facilities, particularly given that we are working in a free but regulated market where companies' boards have a duty to act in the best interests of the company and its shareholders. I think that it will be interesting to see whether the industry does voluntarily change its behaviour rather than requiring the proactive involvement of the regulator."

While regulation of course has a role to play across all industries could there be alternatives that may result in greater productivity or that may minimise disputes or problems? Richard was keen to highlight tax breaks to exploit fields, as is the practice in Norway, as a possible answer. "It seems to me that it would give companies the prospect of fiscal incentives that encourage exploration, the adoption of new technologies, and involvement in frontier regions. Norway is a great example of this, where companies without production automatically receive the tax relief in cash for exploration, which is particularly beneficial for smaller companies.

"In the final Wood Review there is actually an indication that industry interviewees spoke of the benefits of tax breaks and fiscal support from the Government for investment into infrastructure and exploration, with



> If the new regulator can really achieve the goal of being low in bureaucracy and a change occurs in the way that industry participants review co-operation and collaboration in more difficult situations, then I believe that there is every chance that the benefits that are identified in the review will be fulfilled and the industry will have a very strong future

recommendations for the regulator to work co-operatively with HM Treasury to advise and develop appropriate fiscal incentives to encourage investment. Interestingly, the fact that the Government has already introduced tax breaks for the decommissioning sector has reportedly given rise to a surge in new field development, with a capital spend of £14 billion last year. Of course, fiscal measures always take time to creep through, so whilst measures that have been taken are already paying dividends I think that tax breaks and incentives will play a key role in achieving MER for the UK in the future."

Of the future, how the recommendations and proposals of the report develop over the coming months and years will be interesting. Undoubtedly many of Sir Ian Wood's key points will help the UK achieve MER, as has been acknowledged by the positive reception of the industry. However, there are still areas that could prove problematic or need refining, such as the establishing of a new regulator as well as fine tuning the complex area of dispute resolution. Ultimately, the UKCS is in a pivotal stage with challenges that must be addressed and the Wood Review will prove beneficial to the industry.

"As with everything the devil be in the detail," said Richard. "What we have is a report with some very high level recommendations and the key to achieving its goals will be the recruitment of suitably skilled personnel, as well as how the various high level issues are put into practice industry-wide. If the new regulator can really achieve the goal of being low in bureaucracy and a change occurs in the way that industry participants review co-operation and collaboration in more difficult situations, then I believe that there is every chance that the benefits that are identified in the review will be fulfilled and the industry will have a very strong future," he concluded. O&G

BERWIN LEIGHTON PAISNER

Richard Power is a partner in the International Arbitration & Commercial Disputes Group at Berwin Leighton Paisner (BLP), five times winner of 'UK Law Firm of the Year' in the last decade. BLP is a leading international law firm with a reputation for innovation in legal services, and with offices in Abu Dhabi, Berlin, Brussels, Frankfurt, Hong Kong, Moscow, Paris and Singapore, the firm's international footprint was extended further with openings in Dubai, 2012 and Beijing, 2013, helping it meet the needs of clients in an increasingly internationalised market.

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Above: Nigel Jenkins, who will become the new chief executive of Decom North Sea on 1st July

Leading the industry

The Board of Directors at Decom North Sea (DNS), the offshore oil and gas decommissioning forum, are pleased to announce the appointment of a new chief executive to lead the organisation as it further strengthens its position as the representative body for the decommissioning industry.

Nigel Jenkins will take up the post on 1st July and replaces Brian Nixon, who is retiring after playing an instrumental role in establishing DNS as the voice of the decommissioning sector.

Mr Jenkins' previous roles include board leadership positions with AMEC and AECOM and most recently as board director with KDC Contractors, which has a long and successful track record of working on decommissioning projects on and offshore. He also served as a director with DNS from 2011 to 2013.

Mr Jenkins said: "I am excited about the future of offshore decommissioning. The recent Wood Review highlighted the need for operators, the supply chain and regulators to work together to develop innovative decommissioning solutions, maximising the value derived from the North Sea. Decom North Sea has become the representative body for the industry and is uniquely positioned to meet this challenge. I am looking forward to leading the organisation through this fascinating period."

Above: Scott Macknocher, managing director of Ennsub (left) with Barry Stewart, director and general manager at ROVOP

Technological leader

Ennsub, the independent subsea design, engineering and technology company, has been awarded a multi-million pound contract by leading independent ROV service provider ROVOP.

The deal involves the design and manufacture of two ultra-deepwater workclass ROV launch and recovery systems to be installed into global oil and gas subsea construction specialist Ceona's new-build multiple lay vessel, the Ceona Amazon.

The scope of work involves the provision of fully integrated deployment systems capable of operating in heavy-weather conditions through the use of high-speed electric winches providing Active Heave Compensation (AHC) capability.

The equipment, which is estimated to take around six months to design and build, will be installed into the Ceona Amazon during Q3 2014 and will commence operation in January 2015 when the vessel is due to come into service.

Scott Macknocher, managing director of Ennsub, said: "Our focus since the inception of Ennsub has been to develop industry-leading equipment and products which reflect the criticality of reliable subsea operations and we believe that this award recognises this ambition.

"We are particularly pleased to be associated with ROVOP, whose success is no coincidence given the experience of those involved, their approach to equipment and technology, and their strategy of high-end and focused ROV service provision."

Digital debate

Global experts gathered at SPE Intelligent Energy 2014 to discuss the flow of new ideas, processes and technologies that will form the foundation of future smart achievements in the digital oilfield.

Under the theme 'Aspirations and Accomplishments', the programme provoked vibrant debate enabled by panel discussions, special sessions and interactive Q&As. Delegates considered the growing importance of digital energy in increasing asset value while improving health, safety and environmental performance.

Co-chair Steve Roberts, vice president of the Field of the Future Technology Flagship at BP said: "SPE Intelligent Energy 2014 represented an opportunity to check-in with colleagues and peer companies on the upstream journey towards applying smart, autonomous digital technologies to our key work progresses and operations. The conference heard about continued delivery of value through early adopter examples and recognised that some of the accomplishments over the past decade have now become embedded as part of normal working practice."

Egbert Imomoh, 2013 President of SPE (Society of Petroleum Engineers) said: "There is so much that we can learn from events such as SPE Intelligent Energy and I was extremely impressed by the technical content, networking and discussions displayed at this year's event."

WANDFLUH

CORROSION PROTECTION FOR HYDRAULICS AT THE HIGHEST LEVEL

Oil and gas production is increasingly developing in regions where the ambient conditions make high demands on the installations and tools. Installations have to reliably operate also temperatures of up to -60°C or withstand the climate and the seawater on offshore production or transportation facilities.

Many drive functions are performed hydraulically in these installations and therefore provide the necessary power within a small installation space. Wandfluh has a wide range of hydraulic valves, which have been tailored to the requirements of these special ambient conditions. In the field of surface protection, the external valve components are manufactured out of seawater resistant stainless steel. With this „K9“ standard, Wandfluh provides all important valve functions: from the directional valve via the leakage-free poppet valve right up to the pressure and flow control valves. The adjustment of the valve may take place manually or through a solenoid. If movements are to be made with changing speeds or with variable forces, the necessary valves are also available with a proportional function. Specifically in oil and gas applications electrically actuated valves are naturally utilised in explosion-hazard areas. Therefore, for the solenoid a corresponding protection has to be provided, which encapsulates possible sparks and limits surface temperatures, to exclude any ignition source. For this purpose Wandfluh provides a solenoid with many international and national certifications and corresponding certificates. By the zinc/nickel surface coating, a maximum degree of corrosion-protection is assured (> 800h salt-spray test according to EN ISO 9227), which enables a problem-free use of the solenoid also in a corrosive atmosphere.

Figure 1
Ex-protection poppet valve
Electrically actuated and stainless
Type AEXd22060b K9

Figure 2
Manually operated pressure valve made of stainless steel
Type BVDPM22 K9

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BORNEMANN GEWINDETECHNIK

At temperatures below -50 ° C and in stormy seas research heavy duty winches will continue to function and lower measuring sensors, containers or scientific tools on special cables down to the ocean floor in depths of 5000 meters and more. In this environment the scientists of the Alfred Wegener Institute for Polar and Marine Research (AWI) feel at home. Since 1980 the AWI explores the relationship of the global climate and particular ecosystems in the icy worlds of the Arctic and Antarctic. Here, the institute is present with several research stations, ships, aircraft, and a high-caliber team of international scientists from different disciplines.

For various research projects special equipment of the highest quality is required that can operate without compromise in the harsh arctic environment. If components are needed for the manufacturing of such special equipment, the Alfred Wegener Institute also relies on high quality custom made components from Bornemann Gewindetechnik.

For a subsea winch that lowers special cables up to 2500 meters down Bornemann Gewindetechnik manufactured a custom diamond screw made out of titanium. Dipl.-Ing. Lochthofen from the Deep Sea Ecology and Technology Division of the AWI: "With the use of conventional stainless steels such as 1.4571 or 1.4404, the composition of the material can be ensured only to a limited extent. Therefore, we decided to use titanium in order to ensure that corrosion problems would be ruled out by almost 100 per cent."

Bornemann Gewindetechik also supplies other customers from Germany, Norway, the Netherlands, and Scotland that manufacture offshore winches with custom made diamond screws. Some of the diamond screws that are used for heavy loads are up to Ø240mm in diameter and more than five meters long. "The production of these special and critical components has been a specialty of our company since several decades. We even designed and constructed special machines for the production of these parts", says Sergii Goman, international sales manager at Bornemann Gewindetechnik. **www.bornemann.de**

Above: Mark Wood, Atkins' project manager and senior process engineer

Strong relationship

Atkins, one of the world's leading design, engineering and project management consultancies, has been awarded an engineering support contract covering three of Maersk Oil's UK assets in the North Sea.

The Gryphon FPSO, Global Producer III FPSO and Janice FPU are planned for major offshore inspection, repair and maintenance (IRM) works this year, in addition to field expansion works. Maersk has committed to this plan by contracting a dedicated Dive Support Vessel (DSV) for 365 days.

In order to ensure this is completed safely and on time, a team of eight process engineers from Atkins will support Maersk Oil in developing the scope, maintenance plans, commissioning procedures and providing a technical interface between the dive vessel and Maersk Oil's assets. The Atkins team will be managing the scopes through to completion with the provision of offshore engineers and a project management role.

Atkins' project manager and senior process engineer, Mark Wood, commented: "This is a truly multi-faceted contract involving many challenges as we seek to assist Maersk Oil with the enhancement of their existing North Sea assets.

"The agreement builds on a strong record of process engineering support to Maersk Oil over many years so is further testament to our great working relationship. We look forward to delivering successful and incident-free campaigns for each of their assets."

Building skills

With skills shortages being widely reported there has been an increased demand for online management programmes with oil and gas specialisms as mid-career executives act to seize the wealth of opportunities available in the sector.

Dr Roula Michaelides, director of studies for the online MSc in Project Management, University of Liverpool, recently said: "Companies are increasingly focused on both the short and long term benefits of strategic project management to ensure they can deliver and execute the million dollar projects planned worldwide.

"In the last three years, the University of Liverpool has witnessed a growing demand from postgraduate students at executive level for fully online management degree programmes that contain oil and gas specialisms. The online programmes currently have students in management positions at some of the world's most well known companies such as BP. Introduced in 2009, the University of Liverpool's online programmes that include an oil and gas specialism have seen student numbers grow significantly.

"This level of uptake suggests an emerging class of executives within the energy sector who see an opportunity to build their skill set while learning on the job, putting them in a prime position to move up through the ranks and grasp opportunities as they arise."

Above: Michael green, business development manager at Jee

History of expertise

Jee Ltd, a leading independent multi-discipline subsea engineering and training firm, has been awarded a contract in support of a $14,000M seven-year development. The contract, with a major offshore pipelay and subsea construction company, is as a result of recent oil field operations in Canada.

Jee will fulfil the detailed design scope of the company's engineering, procurement, construction and installation (EPCI) contract for the subsea pipelines, as part of the offshore loading system (OLS) for the development. It will provide engineering services, including detailed design and stress analysis on three 24-inch offshore loading lines, which will be installed in 90m of water, as part of a piggable loop.

The scope of work includes Jee engineers reviewing survey information to define and finalise multiple pipeline routes and reviewing all pipeline FEED documentation. In addition the contract involves Jee executing operational stress analysis and pipeline walking analysis, as well as performing any necessary engineering for extra protection of the pipelines to mitigate damage or external disturbance.

Michael Green, business development manager at Jee said: "This contract is a direct result of Jee's engineering capabilities, as well as the quality of our work. With a history of expertise in subsea design, we are looking forward to working on the project, as well as continuing to expand our subsea projects within this developing region."

Abandoned but not forgotten

DR LIANE SMITH EXAMINES HOW WELL INTEGRITY MANAGEMENT NOT ONLY REDUCES THE RISK ASSOCIATED WITH DECOMMISSIONING, BUT CAN IMPROVE RECOVERY RATES, WELL DESIGN AND CONSTRUCTION

Oil and gas fields have a dynamic well population: Throughout their life, there will be wells shifting between producing and non-producing status. The latter might include wells shut-in for workovers and wells that have been abandoned - either temporarily (suspended) or permanently (decommissioned). Even in younger fields, there can be a large number of exploration or wild cat wells that were not built for long life and that will need to be abandoned or shut-in.

An ongoing challenge for operators is to be able to distinguish between safely abandoned wells and those that are not correctly treated. There are many wells that have been inadequately abandoned over time, especially before more concern was placed on this activity. Even today, a well that is shut-in or abandoned cannot be assumed to be safe.

Suspended wells can encounter a variety of problems and, in the worst cases, even those that have been permanently plugged and abandoned (P&A) can start to leak. There are numerous possible causes. Thermal and pressure cycling over the years can generate micro annuli or cracks in the cement seal or other formations above the reservoir while leak paths can develop from the inside of the wellbore outwards, or in the plugs themselves if they have not been positioned or tested properly.

Nevertheless, provided there is some structure left at the surface, there is scope for monitoring the condition of an abandoned well – even if it means using a single pressure gauge to ensure there is a reading of nil above a plug or well head. Best practice is to continue to monitor abandoned wells for a number of years, and a well integrity management system enables operators to do this efficiently and effectively.

Well integrity management systems exist both at a documentation and software level. They combine well operating and production data within a framework for decision-making, management processes and organisational structure. They also enable operators to maintain a full history of their wells. Analysis of historical data not only provides critical intelligence for managing abandoned wells safely, but also helps operators get more from their assets.

Levels of suspension

There are many reasons why a producing well might be shut-in. Shut-ins are often necessary to perform routine maintenance of surface facilities, equipment or pipelines, rather than the well itself. The operator might also be experiencing lower than expected rates of recovery.

Meanwhile, well integrity issues arise from sources such as scaling, corrosion, failed well barrier equipment, or sustained annulus pressure. The latter is the number one killer of wells and can lead to an external leak or, at worst, result in a blowout. Even if no leakage occurs, the risk is that when pressure within the well rises above the design limit at which it is safe to operate (i.e. the safe operating envelope), a failure

of well barrier equipment can be too risky or costly to repair and therefore the well has to be abandoned.

When there is a need to stop the well flow temporarily, there are different methods of well suspension. If a well is being shut-in to stop flow for a short period, this is achieved by simply closing the surface safety valve (typically, the upper master valve). If the well has to remain suspended for a long period of time however, then a heavy liquid such as brine is pumped in to prevent fluid flow. This can then be removed at a later date to recommence flow. Suspended wells may re-enter service several years later should reserves be deemed economically recoverable due to advances in technology, the development of new techniques, or the operator's own capability.

If permanent abandonment is required, the well is plugged by setting mechanical or cement plugs in the wellbore at specific intervals to prevent fluid flow. The P&A process usually requires a workover rig and cement to be pumped into the well to restore the natural integrity of the formation that has been penetrated.

Properly plugged wells can save the operator substantially through avoidance of lost production from fields that are candidates for high-technology recovery projects. If a well is not properly abandoned, it may provide pathways for brines, hydrocarbons or other fluids to migrate up the well and into shallow drinking water aquifers or to surface, leading to the technically challenging and costly task of re-entering the abandoned well to plug a leak.

Growing focus

Historically, the plugging and abandoning of oil and gas wells has not been subject to detailed integrity considerations. In the US, reports suggest that tens of thousands of abandoned wells are badly sealed, either because they predate stricter regulation, or because rules were violated. In Texas, which is home to more than 355,000 oil and natural gas wells, there are about 15,000 inactive wells, some of which have been sitting idle for more than 20 years. Classified as 'orphaned' by the Texas Railroad Commission (RRC), these wells are now subject to plugging by the RRC, which spends between $6 million and $8 million annually to clean up 1300 to 1600 orphaned wells.

In regions such as the North Sea and Asia Pacific, the growing number of aging assets has also meant operators must adopt more robust approaches to managing well abandonment. The UK's Department for Energy and Climate Change (DECC) estimates that as of 2012, there were 740 suspended wells in the UK Continental Shelf, and that the total infrastructure to require decommissioning includes around 5000 wells and more than 3000 pipelines. Industry body Oil and Gas UK believes the cumulative expenditure for this decommissioning could rise above £30 billion over the next 30 years.

Oil and Gas UK has prepared guidelines to steer operators on the considerations that need to be taken when suspending operations in a well for a limited period of time, O&G

the requirement to re-enter the well safely, and abandoning a well. The guidelines provide minimum criteria that should be applied at wells in the UKCS to ensure full and adequate isolation of formation fluids both within the wellbore and from surface or seabed.

There are also guidelines on qualification of materials for the suspension and abandonment of wells written by the Well Suspension and Abandonment workgroup of the Well Life Cycle Practices Forum. Similarly, there are regulatory standards in US jurisdictions that require specific provisions for plugging and documenting oil and natural gas wells before they are abandoned. P&A regulations vary to some degree among states, but all prescribe the depth intervals that must be cemented, as well as the materials that are allowable in plugging practices.

Taking responsibility

Despite industry consensus that the processes and regulation relating to the abandonment of wells needs to be vastly improved, wells continue to be plugged at lowest possible cost and in accordance with the minimum requirements mandated by regulators. Ultimately, P&A work takes capital to complete and provides no return on investment for operators.

While P&A is sub-contracted by most operators to specialist firms, in regions such as the US and Europe, the OSPAR Convention is the current legal instrument guiding international co-operation on the protection of the marine environment and mandates that an abandoned well remains the responsibility of the owner. It is common that ownership of assets are transferred during the life of a field, but the liability for those assets may or may not transfer to the new owner depending on the commercial arrangement.

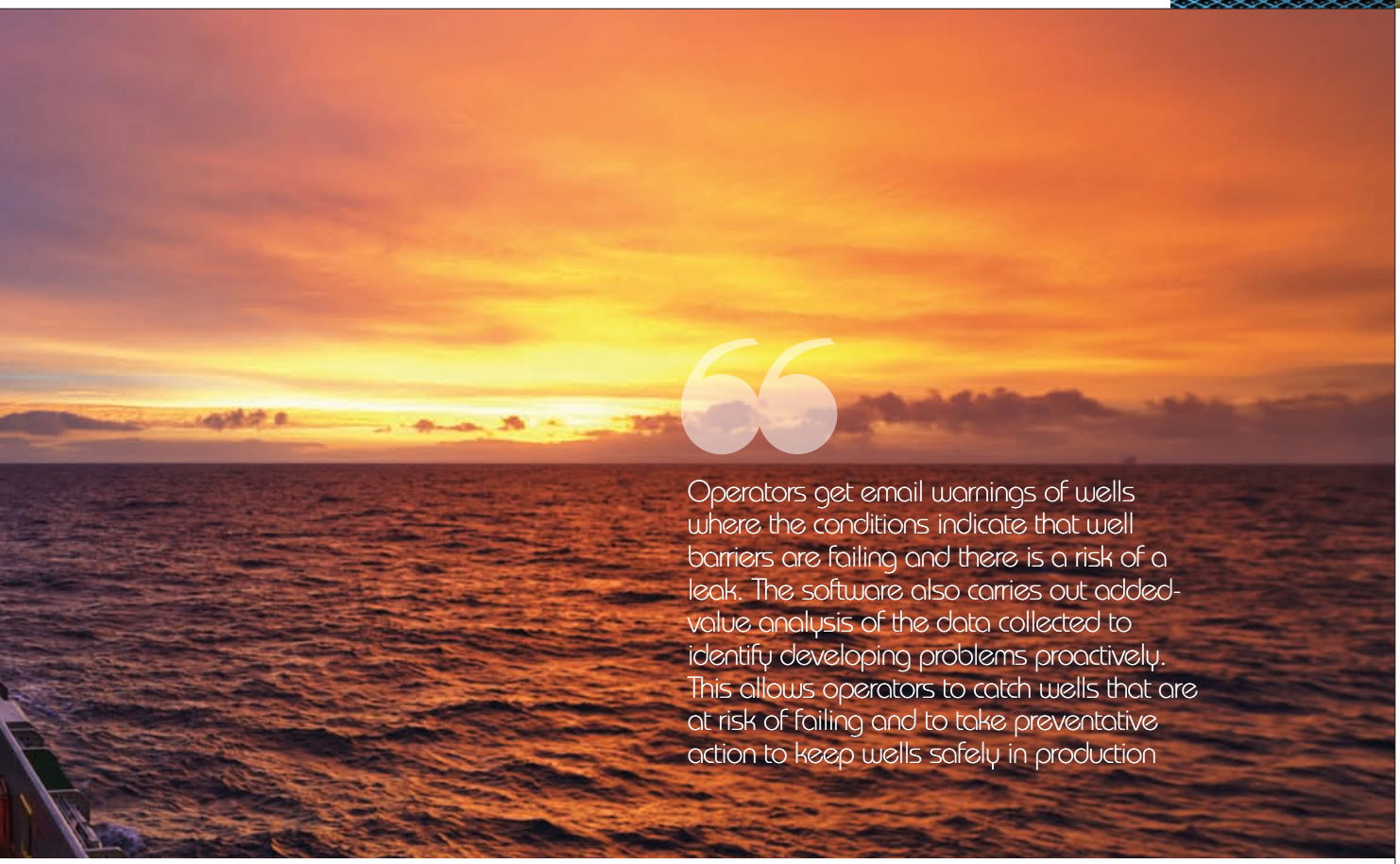
According to a report published by the UK's Royal Academy of Engineering in 2013 examining decommissioning in the North Sea, should ownership of an asset be transferred, liability transfers to the new owner in the vast majority of cases. However, there are limited cases of it remaining with the seller. For example, should a new owner default, liability transfers back to the original licence holder. As such, the report notes that there is a generally accepted understanding within the industry that, 'if you put it there, you take it away'. Operators must therefore take the utmost care to protect the environment at all stages of the P&A process if they are to avoid potential remediation or litigation costs should issues with an abandoned well arise at a later date.

It is worth noting that recent high profile events in the Gulf of Mexico and the North Sea occurred during operations related to well abandonment.

These events have served to highlight the importance of adopting a robust asset integrity management strategy that includes suspended and abandoned wells. Indeed, it is the responsibility of the operator to ensure the integrity of their wells continuously throughout their whole design life – from design and construction, to operation and abandonment.

Getting ahead of the curve

Scaling, corrosion and failed well barrier equipment are all common issues that call for great vigilance to minimise the risk of leakage. The fact is that thermo dynamics always catches up with you: when there is a piece of unprotected



Operators get email warnings of wells where the conditions indicate that well barriers are failing and there is a risk of a leak. The software also carries out added-value analysis of the data collected to identify developing problems proactively. This allows operators to catch wells that are at risk of failing and to take preventative action to keep wells safely in production

steel in the ground it will corrode. Any new engineering system will have some failures due to human error or material defects. There will also be a steady rate of failures corrected by normal maintenance and repair, before the ultimate end of life through corrosion or fatigue damage.

However, many oil and gas operators find that the level of well 'infant mortality' is far too high - wells come into service and quickly develop various integrity issues. Routine equipment leak testing and annulus pressure monitoring is also identifying a high frequency of failures with maintenance running at an above optimum rate. As a consequence, many wells are reaching the end of their cost-effective life before the originally planned design life is achieved. Tools that allow well integrity to be controlled at every step of the way tackle all these problems and result in wells achieving their correct design objectives. Bringing in an advanced well integrity system enables operators to consolidate all of their well data and manage the full lifecycle of their wells.

Using web-based well integrity management software with smart functionality, it is possible to acquire information from multiple sources – including third-party databases and legacy systems – and display it in a single management dashboard. This provides an instant view of current well integrity status as well as historical key performance indicators (KPIs) at a well, field or enterprise level.

Operators get email warnings of wells where the conditions indicate that well barriers are failing and there is a risk of a leak. The software also carries out added-value analysis of the data collected to identify developing problems proactively. This allows operators to catch wells that are at risk of failing and to take preventative action to keep wells safely in production. It also helps operators to ensure a safe and effective P&A or well suspension at first attempt because the well condition is known in detail.

Provided a well was suspended properly, and that the operator has a full history of the materials used, equipment installed, and what damage the well has sustained over the course of its life, it may also be possible to recover and re-design it in a safe and efficient way. With advances being made in drilling and well design, temporarily abandoned wells can prove extremely valuable assets moving forward. Crucially, using historical well integrity data to improve front end processes and equipment selected based on past performance and lessons learned can drive down operating costs, optimise maintenance, reduce workovers, and increase profitability of well operations in the long term. O&G

WOOD GROUP INTETECH

Internationally-renowned engineer, Dr Liane Smith (FREng) is the director and founder of Wood Group Intetech. Wood Group Intetech is a leading asset-integrity company and a pioneer in corrosion modelling and well integrity management services and solutions. Dr Smith is a Fellow of the Welding Institute (UK) and was honoured with a Fellowship of NACE (USA) in 2009 for her pioneering work in the field of corrosion modelling in the oil industry. In 2011 she was elected by her peers as a Fellow of the Royal Academy of Engineering in the UK for her contribution to the international development of well integrity management.

For further information please visit:
intetech.com

The cost of corrosion

USING ENGINEERED SURFACE COATINGS TO MINIMISE CORROSION AND WEAR, AND ENSURE MAXIMUM COMPONENT PERFORMANCE AND RELIABILITY

Metal corrosion is a costly fact of life in the oil and gas industry. Surface deterioration of the metal components used in offshore production processes can lead to premature and often sudden failure with the risk of costly, unscheduled downtime and the threat of hydrocarbon leaks. In the following article Andrew Courtney of Surface Technology, part of Norman Hay plc and a global industry leader in specialist engineered surface coatings, looks at the issue of corrosion and the preventative steps that can be taken in component design, specification and manufacture. He will also explain how minimising corrosion can optimise component performance and reliability, significantly reducing operational downtime in critical offshore applications.

Corrosion can be defined as the gradual destruction of materials by chemical reaction with their environment. According to the United States Cost of Corrosion Study, produced by NACE International, one of the world's leading authorities on corrosion engineering and control, corrosion costs the US oil and gas exploration and production industry $1.4 billion a year. To put the cost of corrosion to the offshore industry in closer perspective, as far back as 2000, retrospective bolt preservation on each of its North Sea assets accounted for costs of between £150,000 and £250,000.

For oil and gas producing operations, there is no escaping the challenge of corrosion; steel is susceptible to corrosion and the harsher the environment, the more accelerated the corrosion process becomes. As offshore exploration moves into deeper and more hostile waters, so the potential impact of corrosion increases. The greater difficulty maintaining components in increasingly remote and challenging environments requires the need for extended component life. Components that have enhanced resistance to the effects of corrosion are now essential as they increase service life and reduce the need for costly maintenance. Developments within the industry, aimed at reducing offshore development costs, involve reduction in platform weight and increasing use of satellite wells and subsea manifolds, all of which require specific attention to corrosion prevention.

Any surface deterioration on the metal products used in key applications can lead to premature and often sudden failure. In addition to corrosion, wear is another factor, typically from abrasion and impact, and while each is damaging enough on their own, they can combine to cause aggressive damage – pitting, roughening, grooves, dents, cavitation and cracking to name but a few. Individually, corrosion and wear are problematic, combined the sum can be greater than the parts.

In offshore oilfields, metal structures and components are under constant attack from a variety of sources from drilling muds to water and carbon dioxide to acid. Much metal loss in oilfield casings is caused by crevice corrosion. Although

Below
Andrew Courtney of Surface Technology

> While corrosion is inevitable, it can be inhibited by the application of specialist engineered coating solutions to extend the service life of components and control maintenance costs. Steps taken at the product finishing stage will minimise the risk and effects of corrosion and so optimise performance and longevity.

corrosion will initially be uniform across the surface area of the metal, in time it will accelerate in any small crevice in the metal. Crevice corrosion often starts at drill-point joints, tubing or casing collars. Pitting equally causes vulnerability when a small scratch, impurity or deformity in the metal can start the corrosion process. Corrosion that starts with pitting can ultimately progress into cracks in the metal, which can be accelerated by tensile stress, resulting in stress corrosion. Corrosion fatigue, when metals are subjected to alternating stresses in a corrosive environment, can affect all types of welded connections on drill ships, drilling and production rigs and platforms.

With an issue as significant in terms of both cost and productivity, we cannot afford to think in terms of rectification. We are, instead, looking at surface engineering – the treatment of material surfaces to change their properties or characteristics to achieve improvements in performance - eliminating corrosion by design. When considering offshore and subsea components, engineered surface coating solutions can be employed to achieve, amongst other things, improved corrosion and wear resistance. As such, it is a discipline that should be applied throughout the design, specification and manufacturing process as an integral part of component development to ensure that the specific needs of the operational environment are addressed.

While corrosion is inevitable, it can be inhibited by the application of specialist engineered coating solutions to extend the service life of components and control maintenance costs. Steps taken at the product finishing stage will minimise the risk and effects of corrosion, and so optimise performance and longevity.

Although there are a number of options, including changing the environment by the use of inhibitors, cathodic and anodic protection – even using more highly alloyed specialist stainless steels – the application of corrosion-resistant coatings is perhaps the most widely used way of protecting steel. The choice of coatings includes organic, metallic or inorganic and there is a wide variety to choose from.

Specialist engineered coating solutions can address issues

of corrosion, gall resistance or fouling problems. Applications typically include Christmas trees, subsea connectors and seals, riser systems, clamps, seat, seals and valves, hangers, threaded components such as nuts and bolts, as well as manifolds and valve bodies.

Coating options offshore

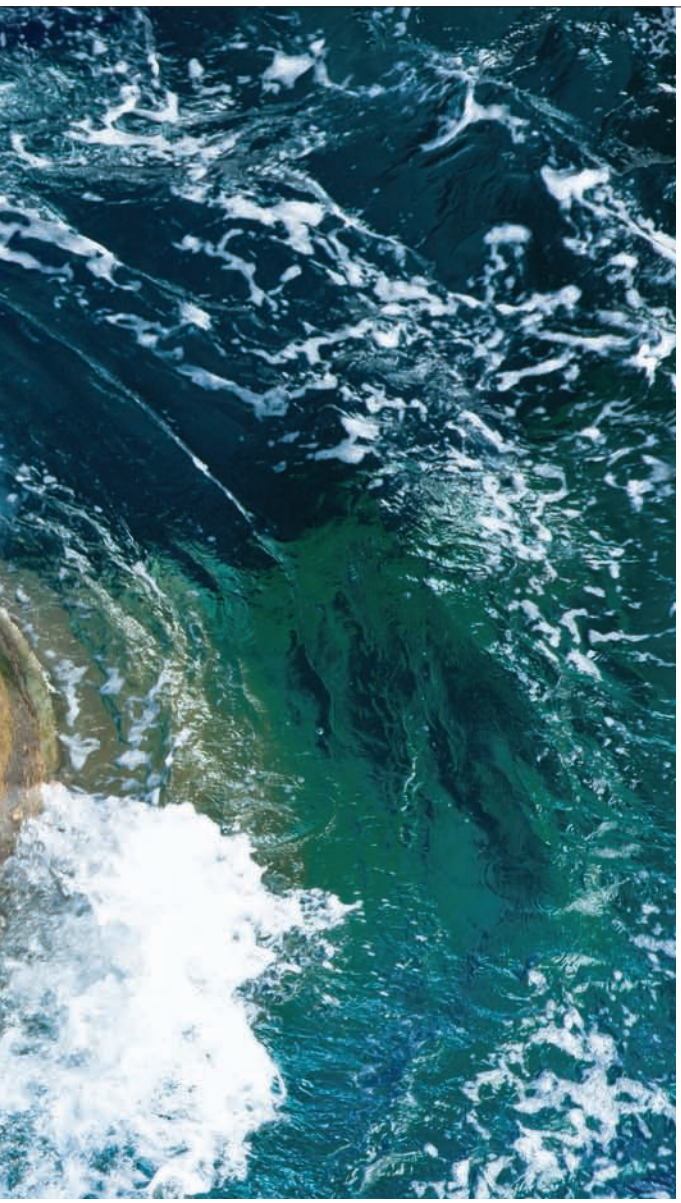
Thermal spray coatings exhibit high resistance to corrosion and wear in extreme applications and are increasingly being used in the oil and gas industry. The use of thermal spray to apply coatings, such as High Velocity Oxy Fuel (HVOF), is one of the most commercially viable and allows the control of various parameters including powder particle velocity and temperature, which influence coating properties such as residual stress, bond coat strength and microstructure.

Another coating system used to provide corrosion resistance, often to offshore structures on-site, is Wire Arc spraying. Wire-Arc thermal sprays provide a dense and strong metal coating and they are an excellent choice for protection against corrosion. Galvanically active coatings such as Zinc and Aluminium can be applied using the Wire-Arc process.

The Wire-Arc process involves two wires that are driven into an electric arc to form molten particles of spray and are forced out of the gun by compressed air onto the substrate. The Wire-Arc spray process is known as a 'cold' procedure, as the substrate temperature can be kept low throughout.

Wire-Arc metal spraying is also used to apply non-slip coatings to protect both infrastructure and employees and is typically applied to walkways and tread plates. Thermal Spray Aluminium (TSA) is also applied using a wire-arc spray gun.

Fluoropolymer coatings are a blend of high performance resins and fluoropolymer lubricants, such as polytetrafluoroethylene (PTFE). This type of coating offers a superior dry film lubricant that produces a smooth, hard, slick surface and provides excellent corrosion and chemical resistance, often used to meet the environmental demands within the offshore oil and gas industry. Fasteners are particularly suited to PTFE coating, with its ability to provide a combination of high corrosion resistance combined with accurate torque loadings. Well head equipment operating under extreme conditions can also take advantage of PTFE high performance coatings, both for corrosion resistance and



its load bearing and release properties.

Armourcote is an engineered coating solution developed by global leader in specialist surface coatings for the oil and gas industry, Surface Technology, to inhibit corrosion and provide surface release for marine equipment. The brand was originally established with the introduction of proprietary composite coating systems developed to overcome the inherent softness of the materials used for surface release and friction control applications. These composites were first developed using fluorocarbon and fluoropolymer coatings and have subsequently been extended to include high load bearing, high temperature precision deposited dry film lubricants.

Benefits include improved wear resistance and lower friction, leading to improved abrasion resistance. The reinforcement peaks take up loads and any wear and abrasion that occurs exposes more of the fluoropolymer coating. The peaks of reinforcement are continuously smeared with the coating, which results in a smooth wear and abrasion-resistant, low-friction finish.

Where greater levels of corrosion protection are necessary for operations in hostile and demanding environments advanced multi coat, anti-corrosion paint systems are often specified, which complement other protective surface coatings to overcome these serious situations. The anti-corrosive qualities of epoxy paint systems make them suitable for providing marine barrier protection on subsea equipment that will be permanently immersed or in the splash-zone. Epoxy systems are also resistant to chemical attack, making them useful on equipment such as pipelines and chemical tanks.

Responding to the challenge

The oil and gas industry has well-established processes that have been used for many years to provide high levels of corrosion resistance.

Surface Technology facilities in key oil and gas manufacturing and production areas in the UK, Australia, Malaysia and Dubai are able to support the industry with dedicated application knowledge and expertise across the full range of coatings used in the industry.

This ability to offer finishes including thermal spray coatings, engineered coatings and anti-corrosion paint systems in conjunction with surface preparation and finishing, gives our customers a one-stop-shop for their entire surface finishing needs.

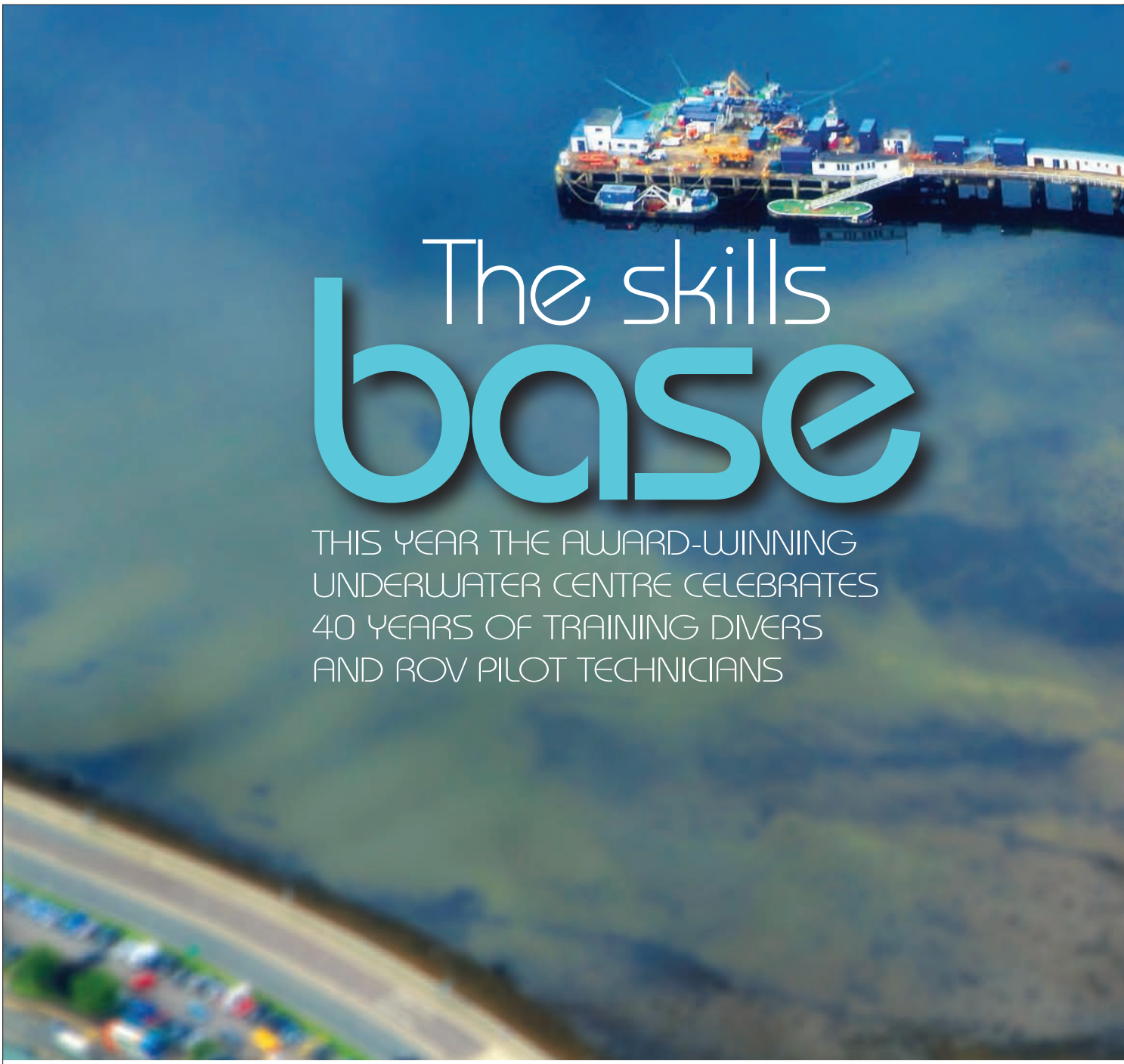
Our experienced, skilled and qualified workforce applies these finishes in strict adherence to the specifications and quality assurance requirements demanded by our customers. We inspect and ensure that our work complies with the requirements of Norsok, NACE and ICORR as expected by customers in this industry.

With an ageing asset infrastructure, a constant need to improve productivity and a move towards increasingly hostile production environments, preventing corrosion is vital in every step of the offshore oil and gas production industry. Having more than 50 years' experience serving this market globally, providing a complete range of engineered surface coatings combined with extensive technical knowledge and application advice, Surface Technology is well placed to help the industry mitigate the threat of corrosion and meet its key challenges of extending equipment life, reducing downtime and reducing operating costs. O&G

SURFACE TECHNOLOGY

Andrew Courtney is from Surface Technology, which has more than 40 years' experience in the development and application of high performance surface treatment for a wide variety of applications, with particular expertise in providing surface treatment solutions to customers in the aerospace, automotive and oil and gas sectors, both within the UK and internationally. Surface Technology is part of Norman Hay plc, a global chemicals, sealants, surface coatings and engineering group.

For further information please visit:
surfacetechnology.co.uk
normanhay.com



The skills base

THIS YEAR THE AWARD-WINNING UNDERWATER CENTRE CELEBRATES 40 YEARS OF TRAINING DIVERS AND ROV PILOT TECHNICIANS

The training of competent workers for the global oil and gas industry has never been more important, what with the ongoing skills shortage that continues to affect the industry and dominate headlines, as well as continued developments in technology and equipment used in the sector.

Keeping ahead of the game in terms of training the personnel required to work in increasingly difficult operational environments is essential, and something which requires vision, planning, and investment on the part of both employers and training providers.

The Underwater Centre in Fort William, on the West coast of Scotland, is one such training facility. This year it will celebrate its 40th anniversary, after first opening its doors in 1974 to provide commercial diver training and as an underwater trials facility. In the 1990s, ROV pilot technician training was introduced to its portfolio, adding to the Centre's oil and gas training capabilities.

Steve Ham, general manager of the Centre, said: "It is hard to imagine that the coming year could be any more busy or exciting than the one just past for us all at The Underwater Centre, but already 2014 is shaping up to be just that.

"A great many students have passed through our doors over the past 40 years, many of whom have gone on to work throughout the world in a variety of different positions within the subsea industry. We are very proud of what we have achieved and it is our aim to build on that success.

"In more recent times, the Centre has risen to the challenge of catering for increased demand from the global oil and gas sector for skilled and competent commercial divers and ROV pilot technicians, and it is very important that we keep that momentum going."

Continuing collaboration with industry has required the

Centre to invest considerably in staff and facilities to cope with the volume of students now passing through its doors. This year already it has welcomed eight new members of staff, providing a wide range of new expertise and experience to its fast-growing student population, including three instructors in the diver training team and a graduate trainee dive support technician, who will assist with the maintenance and upkeep of the diving equipment and help with the numerous subsea trials which take place at the Centre. The ROV team has also increased with the arrival of three new members, who will instruct on the ROV courses, as well as assist in the development of a new training course in work-class ROVs (WCROV).

There has been a significant increase in the number of students at The Underwater Centre in recent years; in 2013, more than 522 students passed through its doors, undertaking courses including ROV, air and mixed gas diving, diver medic and Assistant Life Support Technician - the highest number of students the Centre has had in its 40-year history. 85 per cent of air diving students secured jobs in the industry in the first three months following graduation. Numbers for this year are already looking very healthy, with air diving courses fully booked this year.

Much of Steve's time is spent working with the sector, listening carefully to its wants and needs, ensuring that the courses on offer are in line with market requirements. Graduates must be equipped with the skills required for undertaking subsea engineering, inspection and monitoring operations to prepare them for working in a competitive and challenging industry.

One of The Underwater Centre's recent success stories was securing £490,000 from the Scottish Government as part of a Skills Development Scotland initiative to train new commercial divers in a bid to help alleviate the skills shortage.

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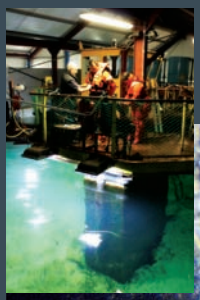
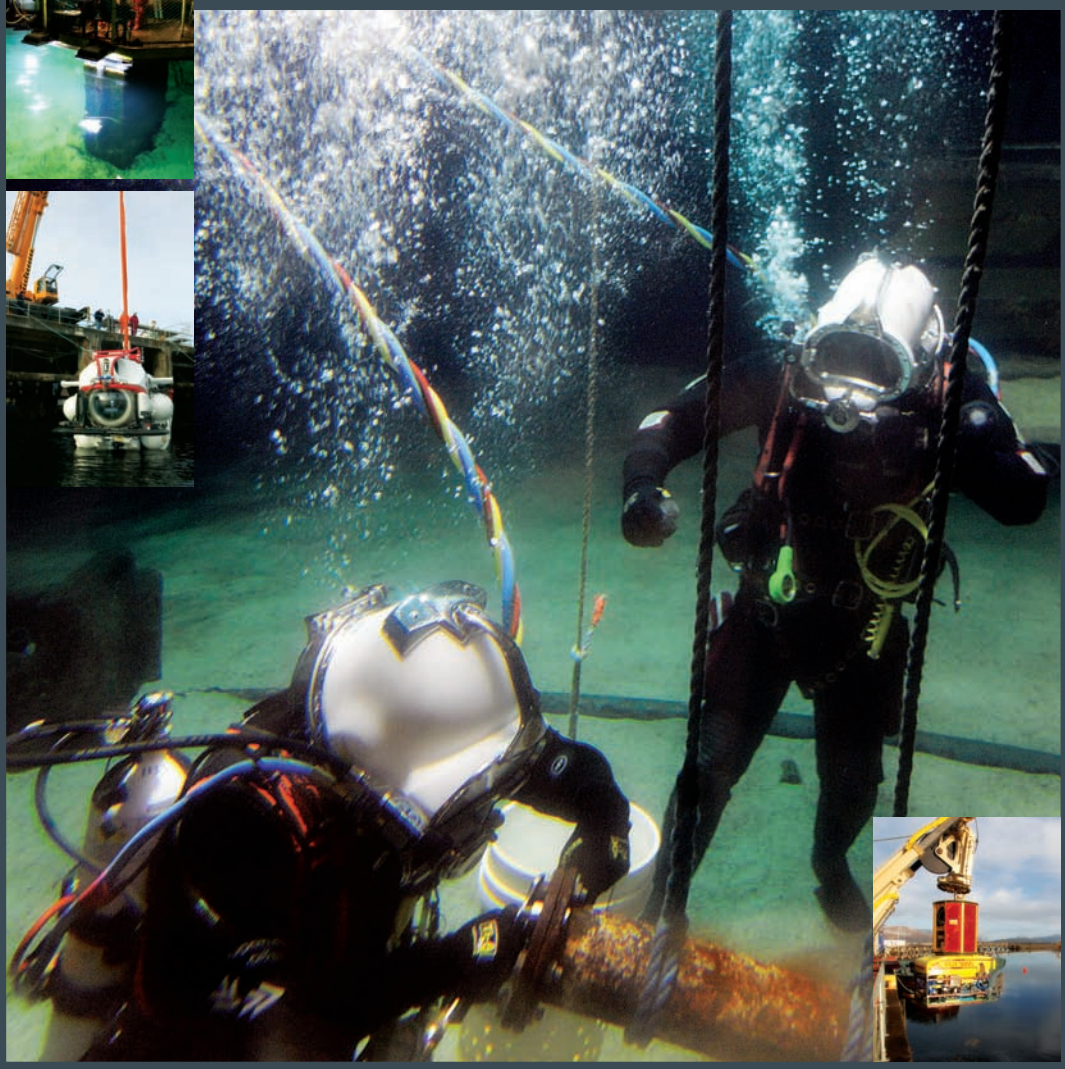




The Centre was able to offer more affordable training packages to students, and the courses were designed with the industry in mind; the 11-week Construction Package or the 13-week Premium Industry Package provided training in the statutory components of the Health and Safety Executive's commercial diving curriculum, as well as training in the use of subsea tools and practical exercises in carrying out construction and maintenance tasks underwater, such as subsea welding and cutting, and rigging and slinging operations.

The final tranche of students graduated in January and the majority have now secured work in the subsea sector.

"The SDS funding was hugely beneficial, not just to us as a training provider, but also to the guys who were able to take advantage of it," he said. "In recent years the barrier to entering the subsea industry as a diver has been a financial hurdle, rather than one of aptitude. The Underwater Centre identified an opportunity to work with Skills Development Scotland to train Scottish-based candidates to become commercial divers, and they provided a funding package that meant that training became significantly more accessible.

"The project sought to create a means for workers to transfer their land based skills in engineering, fabricating and construction to the subsea sector. In 2012, before the funding was available, we trained eight Scottish candidates to become

commercial divers. In 2013, this figure exceeded 60 candidates.

"To change career and undertake new training at any time of life can be a huge investment for many people, so by offering this grant to potential diving students we were able to take away some of the risk and target participants on their past experience and aptitude."

Following discussions with diving contractors in the UK and worldwide, the Centre has recently added a number of new courses to its portfolio for the coming year, including the Introduction to the Principles of Bolt Tensioning, which is now being delivered as part of the HSE commercial diving courses. A surface course using equipment donated by Mach 10, arranged by Alan Melia (now with Global Diving), bolt tensioning is a large and important part of what students will do once working in the subsea sector.

Another is a course in WCROV training, which will begin at The Underwater Centre in June 2014, and which will be taught in a contextual experience environment. The objective is to provide a structured learning experience that accurately replicates the offshore working environment but within controlled surroundings, allowing more timely competence achievement and a faster throughput of ROV personnel to more senior ranks.

Current ROV pilot technician training offered by the Centre goes beyond the International Marine Contractors Association (IMCA) guidelines, and includes training in the latest fibre-optic termination equipment, including hot melt and fusion splicing, which are used in the repair of the main umbilical. Live ROVs are used in all field work and they are flown in tidal conditions with varying currents. Students learn how to mobilise the ROV, create flight logs and navigate by sonar, as well as search for various wrecks and structures on the bed of the loch. They also undertake diver observation, a key skill which is an important part of offshore work, as well as sector searches and structure inspections.

ROVs are a mainstay of the global and European oil and gas markets, working on all aspects of the sector from drilling through to decommissioning and, over the coming years to 2018, the European offshore market is expected to see capital expenditure in this area increase by 84 per cent compared to the previous five years (Source: Infield Systems' OFFPEX Market Modelling System).

It is predicted that this dramatic increase in capital expenditure, driven by a significant rise in pipeline and subsea completion expenditure, will correlate with a rise in ROV demand. Despite the fact that the European market is primarily a shallow water region with a large market for dive support, ROVs can out-compete divers in some cases due to the ability of ROVs to deploy and be recovered faster than saturation divers. This, in combination with increasing ROV demand in waters too deep for saturation divers, means ROV demand will continue to increase.

Steve said: "We have worked with several organisations to create the ROV industry Training Academy, which we believe will transform the way ROV training is done. Students will receive realistic industry-led training at the Centre, which will speed up considerably the time it takes to become competent offshore. To put it into perspective, it can take up to five years to become a fully trained ROV pilot technician. This is because 95 per cent of the training is on the job, and undertaken while working offshore.

"The courses we have planned will offer students the double advantage of being able to train using the two WCROVs, as well as the equipment, expertise and assistance that several organisations have kindly provided. They will also be able to undertake marine-based training on Loch Linnhe. We are extremely grateful for the continued support we have received from industry, which has allowed us to offer the current and relevant training there is."

Students will continue to receive practical experience of flying inspection-class ROVs in an open-water, tidal environment, as well as learning how to take their technical understanding and know-how and applying it to the repair and maintenance of ROVs. Also, by training ROV pilot technician students in the same subsea location as commercial diving students, both come into the industry with valuable experience of a similar operational environment that they will be working in offshore.

Towards the end of last year, the Centre took delivery of three new vessels to meet the demand for its commercial diving and ROV pilot technician training courses, including two ferries – the Loch Sunart and Loch Scavaig – and the Ben Crom, which is used as a workboat to support trials, and as a vessel some companies hire to train their own staff. One of the barges will be fitted out with two WCROVs and supporting launch and recovery systems (LARS). It will be used for WCROV training and will provide realistic training for students learning how to launch the work-class systems from a vessel.

Steve said: "The Underwater Centre is always looking at ways of improving the service it provides, making sure that its courses are relevant and tailored to give companies the confidence that they will have the skilled workforce they need. It is very important that they can be sure that the personnel that they recruit have received training and experience which is relevant to their industry. The industry is constantly evolving and moving forwards in terms of skills and technology, and it is important that we continue to do the same. The next 40 years will be very interesting indeed." O&G

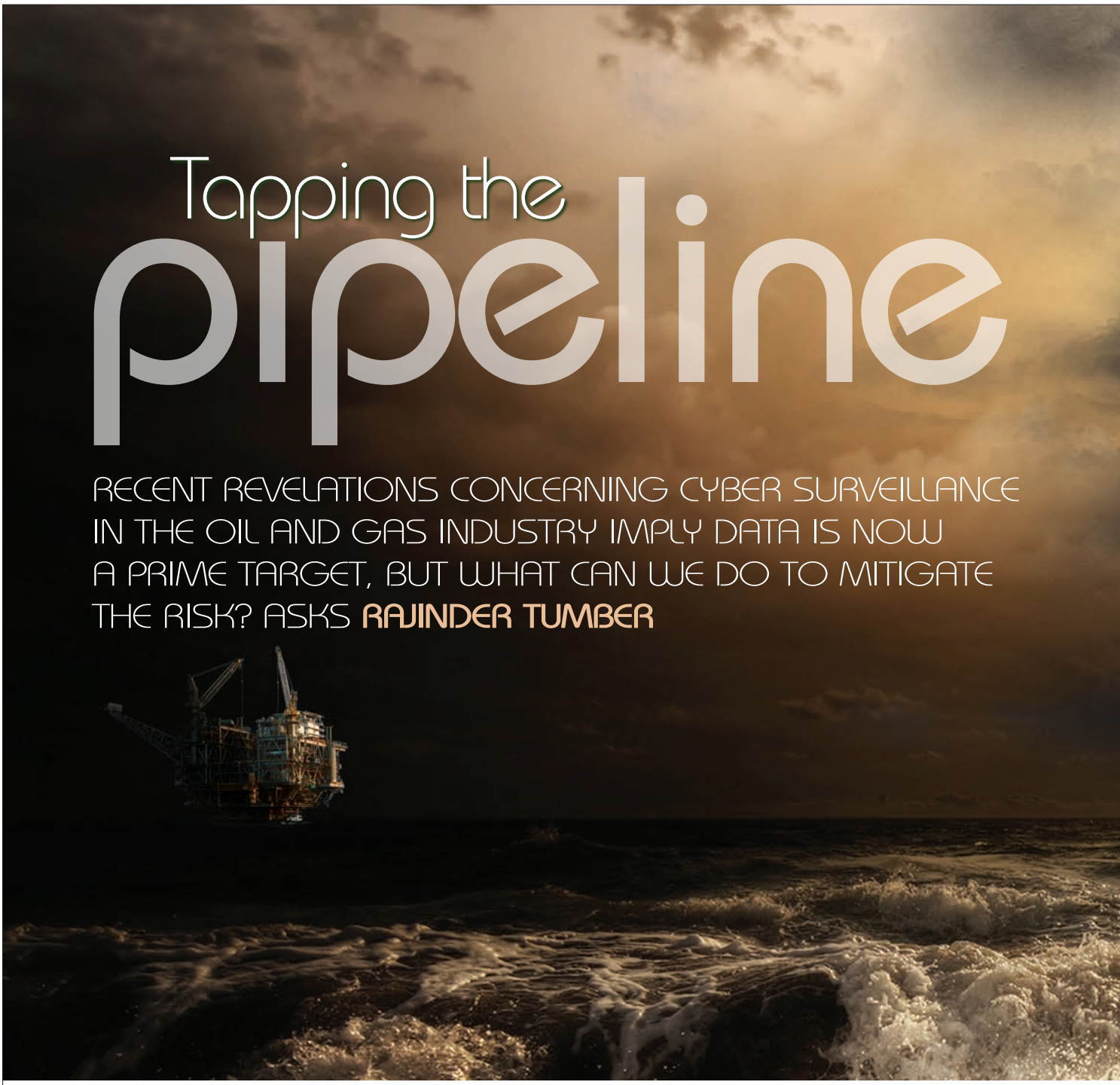
THE UNDERWATER CENTRE

The Underwater Centre, in Fort William, Scotland, was established in the 1970s to provide commercial diving training and as an underwater trials facility. Providing training in both air and mixed (saturation) diving, certified by the Health & Safety Executive to give graduates internationally recognised certification, The Underwater Centre also offers training in key subsea skills. It has also been providing ROV pilot technician training since the 1990s, which runs in accordance with guidelines set out by the International Marine Contractors Association (IMCA).

For further information please visit:
theunderwatercentre.com

Tapping the pipeline

RECENT REVELATIONS CONCERNING CYBER SURVEILLANCE IN THE OIL AND GAS INDUSTRY IMPLY DATA IS NOW A PRIME TARGET, BUT WHAT CAN WE DO TO MITIGATE THE RISK? ASKS **RAJINDER TUMBER**



The evidence for commercial and state-fuelled cyber espionage is growing, from the Icefog 'hackers for hire' which recently hit three US energy companies, to the US National Security Agency (NSA) PRISM surveillance of Total. Cyber surveillance can provide access to highly valuable assets, from intellectual property concerning reserves and exploration sites to the supply and demand of oil.

Data has never been more valuable, as state actors, hactivists, terrorists and competitors all vie for the information required to disrupt, devalue or destabilise energy supply. It is therefore imperative that suppliers and associated organisations begin to acknowledge the threat, understand attack vectors and their vulnerabilities and take action to mitigate these risks.

The last decade has seen US defence planning increasingly concerned with the risk of energy shock, with a major threat being a possible shortfall in global oil output by 2015. Soon after this study, FBI documents obtained through the Freedom of Information Act by the Partnership for Civil Justice Fund (PCJF), confirmed a "strategic partnership between the FBI, the Department of Homeland Security and the private sector" designed to produce intelligence on behalf of "the corporate security community." These FBI documents and those surrounding PRISM suggest corporate espionage has moved up the agenda and that information is liable to become of even greater importance as the demand for energy grows.

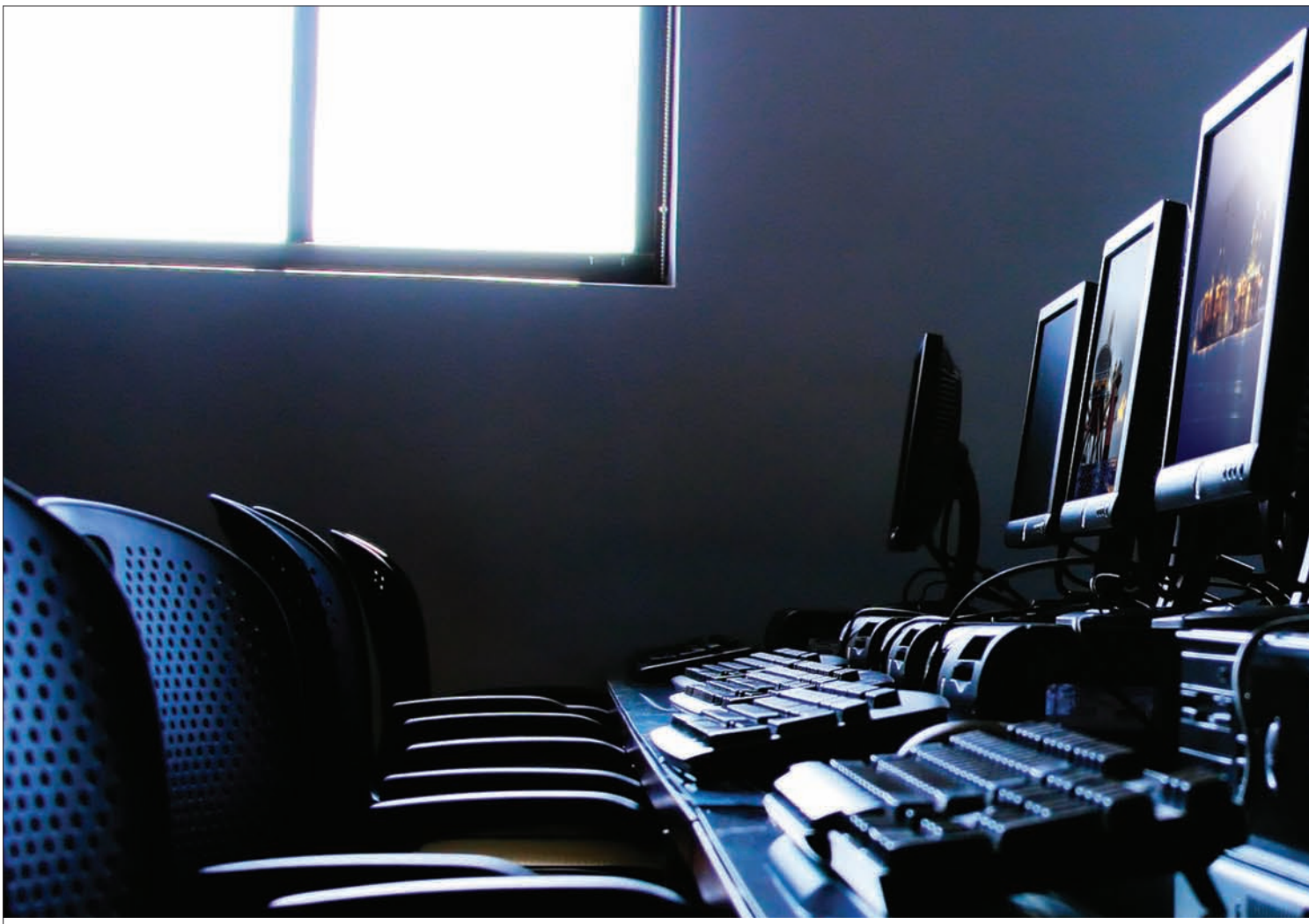
Knowledge is power, as shown in 2007, for instance, when Shell had its data hacked by a spy ring located in Houston, Texas. A group of Chinese workers, who were on Shell's payroll, were also secretly working under orders from the

Below
Rajinder Tumber, security assurance officer at Auriga

Chinese government. They were seeking information to help build oil infrastructure in Africa, where they established agreements on gigantic reserves with various under-developed countries, such as Sudan, which possesses large oil deposits in the Darfur region.

More recently, French oil and gas giant, Total, was revealed to be a surveillance target of the NSA programme, PRISM. While the nature of the surveillance was not disclosed, the French courts investigating PRISM are looking at charging the NSA with “fraudulent access and maintenance of an automated data processing system,” the “illicit collection of data of a personal nature,” “attacks on privacy," and "violations of the secrecy of correspondence”. If Total was subjected to any of these surveillance methods it is fair to assume its data and communications were intercepted and analysed without its knowledge. What confidential information could have been taken? What was the real purpose for targeting Total and perhaps other players within the industry? We may never know but as PRISM data is also fed to the Five Eyes intelligence alliance, formed by a top-secret intelligence sharing agreement between the US, UK, Canada, Australia and New Zealand, it’s highly likely that Total's confidential information has been shared among these five countries.

PRISM gathers the majority of its information from the nine major US Internet firms by monitoring email, video and voice, file transfers, logins and social networking details. But the NSA has also placed software on almost 100,000 off-net computers around the world, allowing the US to conduct surveillance using radio frequency technology on communications that do not rely on the internet. It is not inconceivable that such a software network could be used



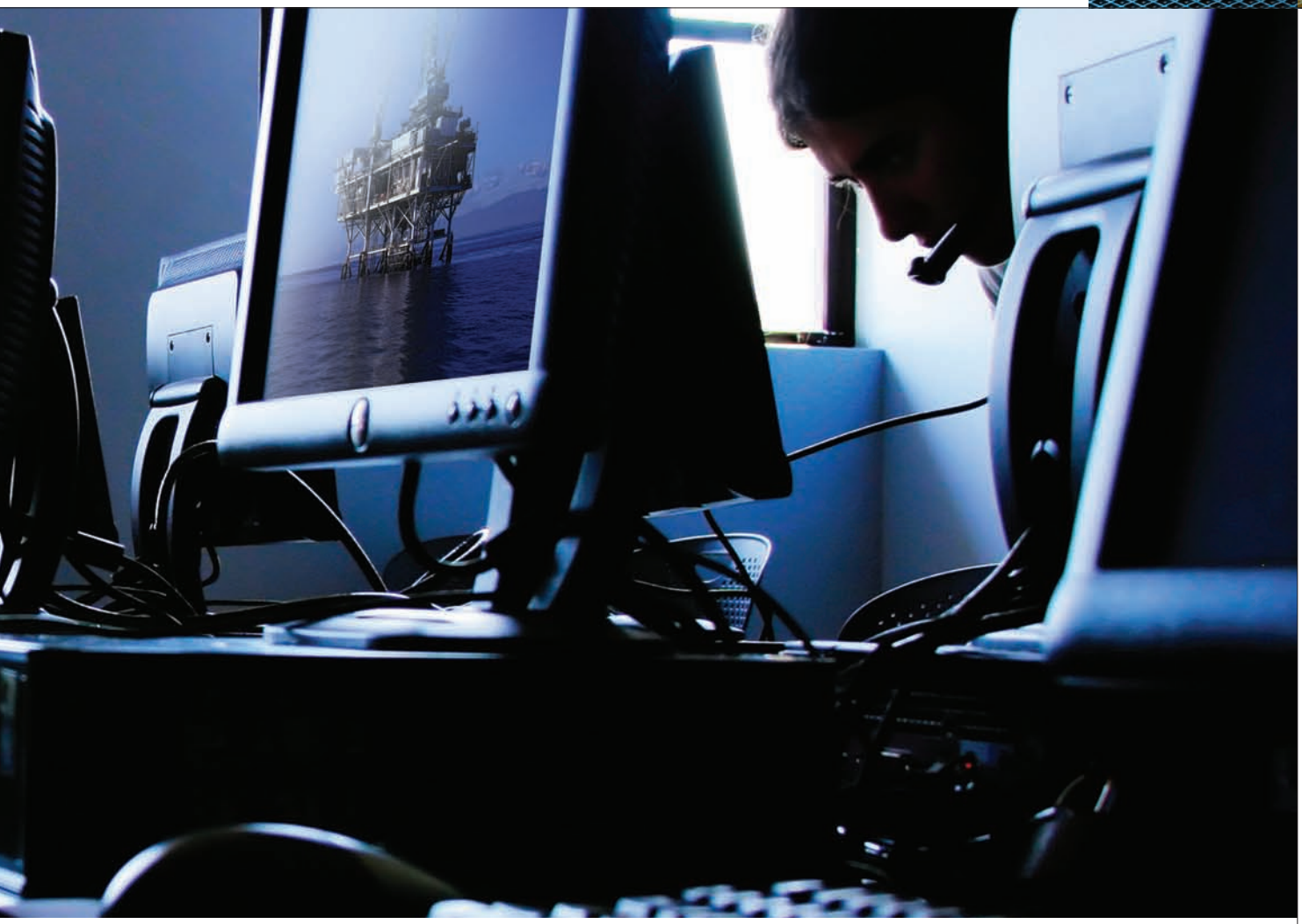
to create a digital highway for launching cyber attacks and malware onto previously sacrosanct systems such as SCADA and control systems.

Further evidence of targeted malware came to light at the end of January when it was disclosed that so-called watering hole attacks were carried out to spread a remote access Trojan (RAT) called HAVEX. Waterhole attacks have been used in a number of cyber espionage cases over recent years and target websites that are a popular resource to specific users. By injecting Java script into the website, its possible to redirect users with running unpatched browsers or vulnerable versions of Java to a bogus website controlled by the hacker. The payload is downloaded on to the end terminal.

According to the Crowdstrike 2013 Threat Report, HAVEX has been used to target numerous oil and gas companies across the US, Europe, the Middle East and Asia. HAVEX sends system information to a command and control centre and harvests passwords from browsers as well as establishing backdoors on infected endpoints to enable the hacker to deploy additional malware. Unlike most malware, HAVEX is surprisingly sophisticated. It features RSA public key cryptography enabling it to encrypt and authenticate malware files and queries the BIOS of the systems inside the organisation (the boot-up software run by a terminal) potentially enabling the attackers to overwrite or replace the BIOS and maintain persistent access. The sophistication of the code and pattern of deployment has led Crowdstrike to speculate it originates from Russia.

The Java exploit was also used by the Icefog attackers to target three US oil and gas suppliers last year. Kapersky Labs revealed that employees were duped by a phishing email that contained a Microsoft Office exploit but once inside the system, the attackers launched Java-based attacks and set-up backdoors to the command and control systems. The exploit was found to be regularly sending out system information to a domain called lingdona.com/news. Eight Internet protocol addresses belonging to the three oil and gas companies were found to be communicating with this domain address, despite the fact two of the users were running patched versions of Java. Potentially, this could have enabled the Icefog hackers to set-up an Advanced Persistent Threat (APT), monitoring and extracting files or changing system settings at will over a sustained period of time, had it not been discovered.

Thankfully, of the three companies notified, two are now clear of the infection but these examples go to show how real the threat can be. Cyber espionage is a growing threat in a sector where resources are in high demand. Today, harder-to-extract oil and gas continues to be discovered, and current technology and techniques may not be equipped to fulfil the task. Additionally, new frontiers with ample deposits of oil and gas are known to exist under harsh terrain, e.g. shale beds, deep seas, and even the ice and snow in the north. To exploit these new frontiers, the advancement of technology is



becoming more important in this industry. If an organisation has been working upon innovative technology, how can it protect its patents for inventions, copyrighted drawings, software code, user manuals and trade secrets?

The incentives are there but what can we do as an industry to mitigate the risks? Firstly, it is advisable to undertake a complete overhaul of security using specialist consultancies, suppliers and auditors. Given the sophistication of the attacks, reliance upon the usual annual security audits will not provide adequate protection. Seek advice from respected independents with experience in the field who can perform the kind of deep penetrative testing needed to spot APTs.

Secondly, ensure a Defence in Depth strategy is adopted, beginning with the SCADA or control system, which should be surrounded with an effective electronic security perimeter before hardening the devices within. This security perimeter should comprise both managerial and technical controls, set at primary, secondary and deeper defence layers. Layers of defence must consider the electrical, environmental and operational requirements of the SCADA and control systems, as well as remain within the boundaries of ANSI/ISA99, NERC CIP and IEC Standards.

Security is fundamentally about processes and people. So it is also crucial to implement security controls to protect against the theft of intellectual property by insiders as well as outsiders. Employee vetting and security incidents must be examined thoroughly. An aspect that can often be overlooked, for example, is the recruitment and redundancy process. How do you instil security best practice in new staff and how are access privileges terminated when they leave?

It's clear that state actors and commercial entities are carrying out cyber espionage on an unprecedented scale, with ever more sophisticated techniques at their disposal. The energy sector needs to stop thinking of itself as a supplier and adopt the mantle of guardian of a precious resource. By applying the same levels of care and protection to the data pipeline as those awarded to an oil or gas pipeline, it becomes possible to thwart such attacks and create a form of counter-espionage. OGG

AURIGA

Rajinder Tumber is security assurance officer at Auriga, the data, ICT and security consultancy. Auriga combines information security and assurance with business process management to offer a unique form of consultancy capable of analysing and securing valuable data. The company has worked on some of the most demanding projects in the UK and offers a range of services from compliance to risk management to business transformation. Auriga consistently improves security and business functionality as well as delivering measurable return on investment.

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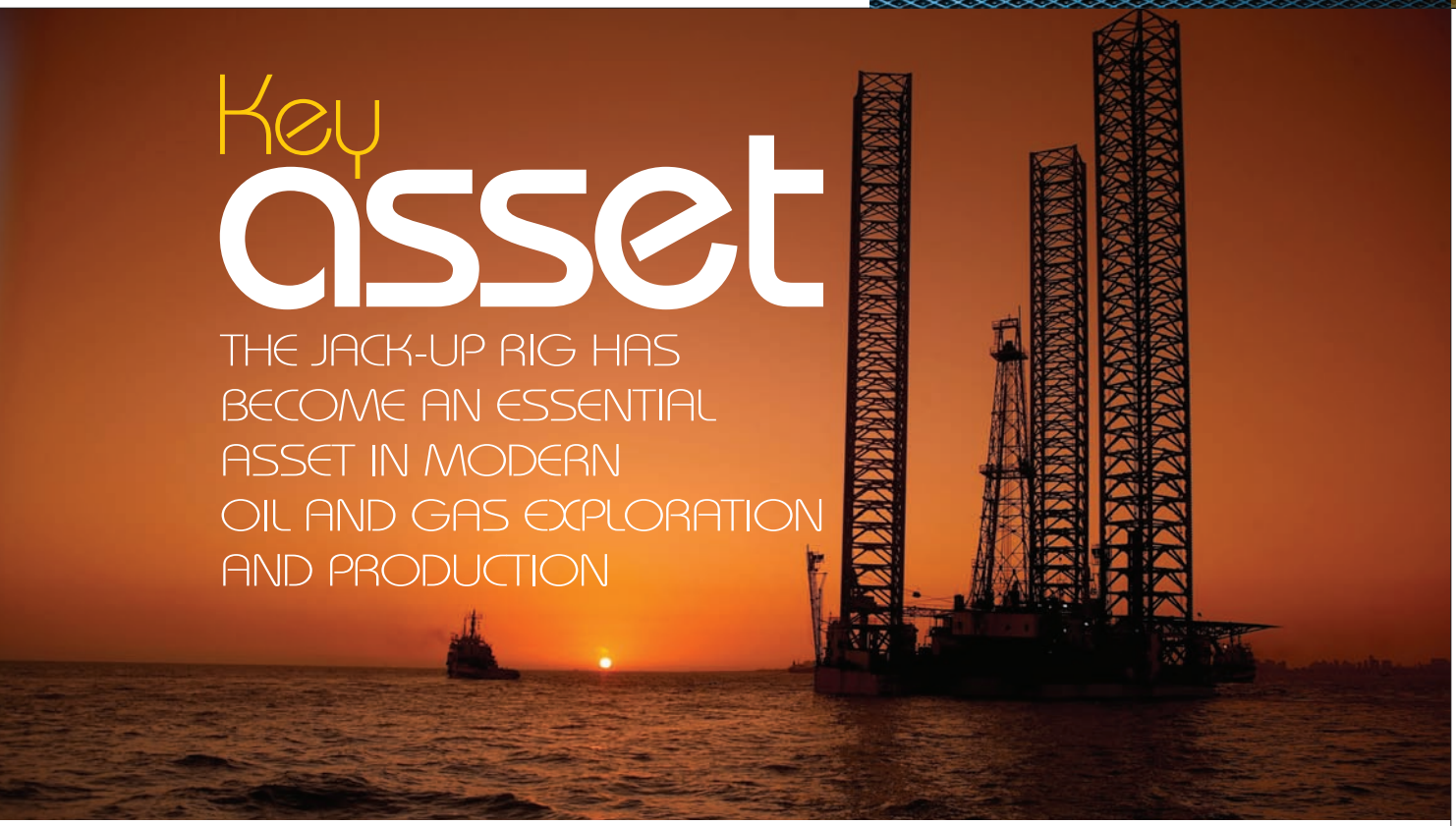


Key asset

THE JACK-UP RIG HAS BECOME AN ESSENTIAL ASSET IN MODERN OIL AND GAS EXPLORATION AND PRODUCTION

riginally conceived in the 1950s to carry out civil construction work in shallow waters, the jack-up rig has become an essential factor in global E&P operations, with growing oil demand due to rising population rates, increasing E&P expenditures, and improving worldwide economic conditions continuing to boost the growth in the jack-up rig market. In response to such demand, the jack-up has witnessed an incredible evolution from its early incarnation to the modern, state-of-the-art systems capable of operations in the harsh oil and gas environments of today.

The jack-up rig is a mobile, self-elevating drilling platform equipped with legs that can be lowered to the ocean floor until a foundation is established to support the drilling platform. Once this is established the whole platform is 'jacked up' the supporting legs in order for it to be above the highest expected wave heights in the operating environments. Until recently jack-up rigs have been subject to maximum water depths of 350 to 400 feet according to their leg length, while at the other end of the spectrum some have hulls that allow them to drill in water depths of as little as ten feet. Units vary principally in such areas as leg length, drilling mode capabilities, and seabed/leg interaction.

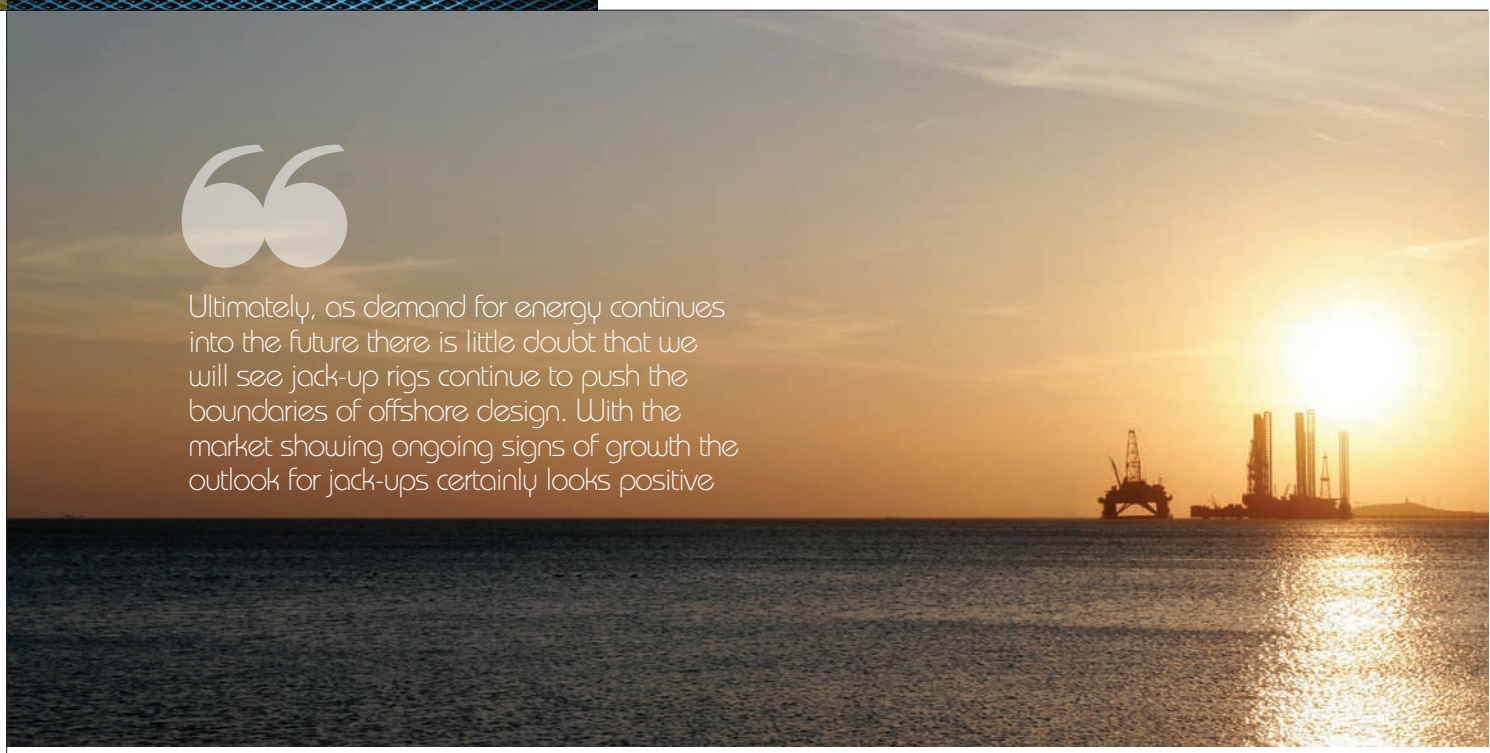
Modern units are incredibly advanced compared to their early counterparts, with innovation throughout the sector seeing considerable evolution in the jack-up field – in fact, today several units are capable of operations in similar adverse conditions that would have previously been the reserve of larger semi-submersibles or drill ships.

The most common offshore drilling unit is the self-elevating jack-up, which consists of a buoyant hull and the aforementioned legs, usually numbering three or four. These legs, which are usually either open-truss legs or columnar legs, are formed from a lattice of trusses fabricated with reinforced steel for maximum strength and stability during operation.

The legs can be placed directly on the ocean floor, depending upon if the floor is able to withstand the rig's pressure. However, in environments where the ocean floor is of intermediate strength the legs are equipped with spud cans, a circular or polygonal can that is constructed with a heavy point to penetrate the sea floor. Not only does this aide retrieval of the unit once drilling has been completed, but the spud can significantly aid stability during operations. In oceans with very soft floors further stability can be achieved by the employment of steel mats that are welded to the bottom of the rig's legs, which helps to evenly distribute the weight and pressure onto the ocean floor.

Once in place drilling can commence from the main deck of the unit, which supports the drilling deck and associated equipment. The most widely used method here is a cantilevered jack-up, where the drilling derrick is mounted on an arm that extends outward from the drilling deck to achieve maximum efficiency during the drilling operations.

Through utilising this basic approach the jack-up provides a number of key advantages to operators worldwide. One of the key benefits of employing a jack-up design is cost, not only is the unit less expensive to build than any other type of modern offshore rig but because of this operators achieve a lower day rate and, ultimately, lower overall operating costs. Similarly, because the rig is mobile and largely self-contained, logistics costs are lower – the rigs require a smaller crew, less powerful boats to transport them from site to site, and generally speaking require no anchoring. Due to their relatively simpler technology jack-up rigs often require



> Ultimately, as demand for energy continues into the future there is little doubt that we will see jack-up rigs continue to push the boundaries of offshore design. With the market showing ongoing signs of growth the outlook for jack-ups certainly looks positive

less maintenance and upkeep than semi-submersibles, particularly as the wellhead assembly is simpler. All of this results in less downtime, one of the most important factors in modern oil and gas operations.

In recognition of this the industry has seen a surge in jack-up investments over the last two decades. Since 2004, for example, the jack-up market witnessed year on year growth, with only a brief dip in 2009 that coincided with the global financial crisis and was no reflection on the use of the rigs themselves. The global market for large active jack-up barges saw utilisation levels increase by 12 per cent in 2011 (versus 2010) and ended the year at 91 per cent on the back of higher oil prices and boosted demand by 20 per cent in 2011. Interestingly, a similar pattern was seen in the smaller, sub-1000 tonne jack-up barge market, which was driven by the global demand from wind farm construction, inspection, repair & maintenance (IRM) work, geo-technical surveying, and general marine construction work.

The market in 2013 reported the highest orders to date in terms of jack-up construction and high day rates. This pattern is likely to continue over the coming years due to the ongoing increase in offshore exploration and overall productivity, as well as the investment in infrastructure, offshore production and energy products in the emerging BRIC (Brazil, Russia, India & China) countries.

Of course, as the industry grows so too will the demands of operators in terms of jack-up rig capabilities, with designers and manufacturers pushing the envelope of what a jack-up rig can do. In April this year for example, the industry saw the introduction of the world's largest ever jack-up drill rig, the Maersk Intrepid. Representing a total investment of $2.6 billion, the Maersk Intrepid is the first of four ultra-harsh environment jack-ups that Maersk will receive between 2014 and 2016. With a leg length of 206.8 metres, the rigs are designed for year-round operation in the harsh environments of the North Sea in water depths of 150 metres. The Maersk Intrepid will be operational at the Martin Linge field development in the Norwegian North Sea, where it will employ the latest technology to drill highly demanding and complex wells.

In a true evolution of jack-up technology the Maersk Intrepid will maximise drilling and uptime through dual pipe handling, which means that while one string is working in the well bore, a second string of drill pipe, casing or bottom hole assembly can be assembled or disassembled and stored ready for transfer for use in the well bore, which reduces non-productive uptime significantly. Furthermore, crew consistency and improved efficiency will be achieved by Multi Machine Control, which is a fully remote operated pipe handling system that allows all standard operations to be performed without personnel on the drill floor.

New developments such as the Maersk Intrepid represent the future of jack-up rigs, as designers continue to overcome the limitations that have previously faced the units. Chief among these has been safety and water depths. Intrepid demonstrates that the depth limitation is certainly being stretched, but problems can still arise in jack-up operations. For example, one inherent danger is the formation of the seabed, where weak layers of sea floor present potentially disastrous chances of a rig toppling. At the same time, as operators push into deeper waters and more hostile environments rig stability will become an increasingly difficult challenge to overcome.

Ultimately, as demand for energy continues into the future there is little doubt that we will see jack-up rigs continue to push the boundaries of offshore design. With the market showing ongoing signs of growth the outlook for jack-ups certainly looks positive. New developments like Maersk Intrepid demonstrate the possibilities of modern E&P exploration, and with similar projects ongoing worldwide its almost certain that the jack-up rig will continue to play a vital role in modern oil and gas exploration. O&G

The power of collaboration

This year's Offshore Technology Conference (OTC) surpassed all expectations, proving that it continues to be the world's most important event related to the development of offshore resources in the fields of drilling, exploration, production, and environmental protection.

Between the 5th and 8th of May experts from the global offshore energy industry came together for the annual event at Reliant Park in Houston, US, contributing the highest ever attendance in the show's history – a 46-year high of 108,300, which is a 3.3 per cent increase on OTC 2013. Furthermore, the sold-out exhibition was the largest in OTC history, covering 680,025 ft2 of floor space and featuring the latest developments from companies throughout the global energy industry. In fact, 2568 companies exhibited this year from 43 countries, a figure that included 163 exhibitors new to OTC. International companies made up 44 per cent of total exhibitors, demonstrating the truly global nature of OTC.

Commenting after the event, Ed Stokes, chairman of OTC highlighted: "OTC's great success this year is yet another validation of the great vision inspired by the founders who created the conference in 1969. Clearly the deep and broad coverage of the technical programme, flanked and supported by excellent panels, executive keynote presentations, distinguished and spotlight award winners, as well as thousands of displays of the latest in new technology at the exhibition, continues to demonstrate the power of collaboration from our member engineering and geoscience societies and trade organisations moving the offshore oil and industry forward safely, sustainably and with due consideration of environmental protection."

As ever, OTC's conference remains the best way for industry insiders to gain advanced technical knowledge, understand market trends and developments, and to make valuable, lasting contacts through exciting networking opportunities. Visitors this year were presented with nine panel sessions, 29 executive keynote presentations that were held over breakfast and luncheon meetings, and the chance to view and discuss 308 technical papers. All of these sessions were led by speakers from the leading major, independent and national operators worldwide, academia, and federal and regional government officials.

The conference covered a broad range of topics, allowing visitors an insight into many of the key issues facing the industry today and into the future. The OTC 2014 Technical Programme for example touched on such things as important project updates from key industry operations around the world, including Shell Mars B, as well as projects from leading companies like Pemex, Total, Petronas, BP Chevron, Noble, CNOOC, Statoil, INPEX, Maersk, Marathon, and Anadarko. Other important areas included subsea engineering talent, new applications for underwater monitoring, process safety, and the economic future of the industry. OSG

Naturally, safety remained a key topic, as it does every year, with a special breakfast and luncheon focused solely on the subject, while a number of sessions were also held looking at prospective opportunities in the Gulf of Mexico region, including Mexico's energy reform, as well as an industry breakfast co-sponsored by the US Department of Commerce.

Another important aspect of each OTC is the annual awards that are presented at the event. For example, OTC recognises innovative technologies each year with its Spotlight on New Technology Award, which is exclusively for OTC exhibitors and showcases the latest and most advanced technologies that are at the forefront of the industry.

This year the Spotlight on New Technology Awards recognised 12 innovative technologies that had contributed to the industry producing offshore resources. Recognised this year were advanced technologies and state-of-the-art developments from Baker Hughes, FMC Technologies, GE Oil & Gas, Geoservices, A Schlumberger Company, Halliburton Drill Bits and Services, SBM Offshore Schlumberger, Weatherford, West Production Technology AS, and WesternGeco.

The annual OTC Dinner also saw the presentation of a number of Distinguished Achievement Awards, with the award for individual achievement given to Carl Arne Carlsen, senior vice president and member of the Governing Board at DNV. He was honoured for his significant advancements in the safety and reliability of mobile offshore structures and the practical applications of risk management. Over the course of a long career Mr Carlsen's dedication to improving safety has borne some important developments in the energy industry, including his work in establishing rules for dynamic behaviour of jack-up platforms, semi-submersible platforms, and for operation of FPSOs in harsh environments.

In addition, BP's Clair Ridge development was awarded the OTC Distinguished Achievement Award for Companies, Organisations, and Institutes, and Susan Cunningham, senior vice president of Gulf of Mexico, Africa, Frontier Ventures and Business Innovation or Noble Energy, was presented with the OTC Heritage Award.

Overall OTC 2014 was a perfect example of why OTC remains so important to those in the energy industry. With record-breaking achievements marking its success, planning is already well underway for OTC 2015, which will take place between 4th and 7th May 2015. In fact, at the end of this year's show a new event called 'd5' was announced, which will debut at the end of OTC 2015 and is designed to bring together the best thinking and creativity from inside and outside the E&P industry to create a rich environment for innovation and inspiration. With this addition there is little doubt that OTC 2015 will build on this year's success and see more records broken. O&G

Overall OTC 2014 was a perfect example of why OTC remains so important to those in the energy industry. With record-breaking achievements marking its success, planning is already well underway for OTC 2015

OTC 2015

OTC 2015 will take place between 4th and 7th May 2015 at Reliant Park in Houston, US.

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Sea sense

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AllMaritim AS has been a leading supplier in the international oil spill response industry since 1988. Today, we are recognised in more than 30 countries providing the best possible oil spill response solutions worldwide. AllMaritim entered the Brazilian market in 2001 and has been doing business with OceanPact since the company was established in 2007. OceanPact is a professional user of AllMaritim's renowned technologies such as the NorMar Offshore Skimmers and the NOFI Current Buster Series, among others. AllMaritim is proud to announce that we have recently signed a contract with Damen Shipyards of Gorinchem for the supply of offshore oil spill recovery equipment, the NorMar 250TI skimmer system and the NOFI Spill Raider 1200S/1000S, to four new Oil Spill Response Vessels (OSRV), in which the end-user is OceanPact.

Specialising in emergency response services, both on and offshore, Brazilian firm OceanPact has worked with all major oil companies operating in Brazil. Involved in many of the most notable critical environmental response operations over the last decade, including the largest ever oil spill in the Gulf of Mexico, OceanPact is a trusted provider of exceptional support in the biggest emergencies.

Backed by reliable, efficient and innovative solutions, OceanPact has developed a strong reputation for superior services; these include consultancy, Nautical Institute certified training programmes, vessel charters and operation, and emergency response management. Furthermore, the company offers the provision of specialist crews and competent, highly qualified personnel as well as marine survey services such as oceanography, geotechnical and geophysical studies. With ready-to-hire specialist crews and personnel based in Brazil and abroad, the OceanPact team consistently delivers innovative, safe and efficient solutions.

A provider of world-class emergency response, OceanPact offers 24/7 availability via its standby alert teams and fully operational emergency response centres. It also offers an integrated solution that includes oil spill response and clean up services for Tier one, two and three incidents; oil spill recovery vessel (OSRV) operations, containment booms and oil recovery equipment maintenance and systems. Furthermore, as a company operating in dangerous environments, OceanPact operates in compliance with all relevant environmental, marine and coastal protection policies; a commitment that has partly been developed through close relationships with environmental agencies. On top of this, the company has a strong reputation for adhering to stringent QHSE regulations and delivering projects without incident or impact, both on time and on budget.

Aware that a company is only as good as its last project, OceanPact is dedicated to continued improvement in all areas of the business and invests huge sums of money into the development of technological innovations. For example, it has created a qualification programme to comply specifically with Brazilian legislation and client demands within the oil and gas industry. Furthermore, it has developed and patented the spiral configuration boom, developed the oil spill contention vessel operation simulator, and improved environmental protection and safety through design and technology enhancements.

To deliver these innovative solutions and provide high quality services OceanPact has recruited, trained and managed an expert team of professionals within a number of business segments. Following the implementation of safety procedures by customers such as Petrobras, the company has established a group of HSE supervisors and assistants to operate onboard seismic vessels. Moreover, the company also has specialist crews of helicopter landing officers, oil spill co-ordinators and radio operator crews.

Keen to expand its presence in both Brazil and further strategic locations around the world, the company has developed complementary joint ventures and partnerships with well-renowned organisations; these include O'Brien's do Brasil, a joint venture between OceanPact and O'Brien's Response Management, a North American global leader in emergency management. Focused on supplying companies operating in Brazil with superior world-class practices in the management and execution of emergency response services to environmental incidents and disasters, O'Brien's do Brasil integrates the core strengths of each company in relevant areas such as consulting and emergency management.

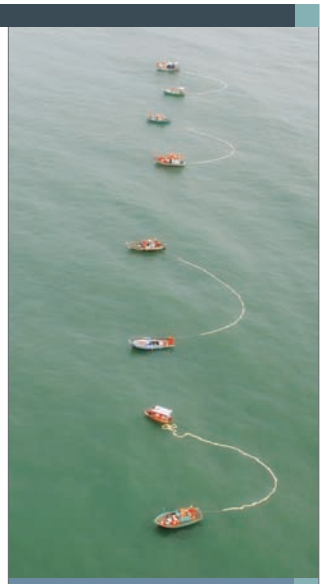
O'Brien's do Brasil's comprehensive structure of services ensures clients achieve maximum resilience so they can further increase efficiency during preparation, response, communication and recovery. More specifically, the services include regulatory plan preparation, literacy training for crisis and emergency, assisting management with incident response and conducting exercises. Indeed, by merging the knowledge and experience of three renowned

companies, all of which boast an excellent reputation in Brazil, the partnership can offer best-in-class services and take advantage of a booming Brazilian market.

In addition, the company has further expanded its presence in Brazil through a joint venture with specialist survey services provider Gardline. Announced in April 2013, Gardline Marine Sciences do Brasil SA is a 50/50 strategic partnership between the two companies and will involve the integration of both firms' marine competence and resources to take on marine survey projects in Brazil. Focusing on the provision of wholly integrated survey packages that will include geophysical, hydrographic, oceanographic, geotechnical and environmental surveys, the joint venture's services will include 2D seismic exploration, shallow gas hazard analysis, seabed mapping and 2D/3D high-resolution data acquisition. Having worked together previously on a ground-breaking project for Petrobras in 2012, which involved mini-CPT data and vibrocorer samples being acquired for pipeline route design for the very first time, the two companies anticipate high levels of success.

Committed to adopting the best possible business practices in a wholly compliant and innovative manner, OceanPact's joint ventures and partnerships not only surpass the expectations of customers, but also satisfy the demands of shareholders, collaborators and partners within the industry. Moreover, the company ensures ongoing explorative developments and the exploitation of coastal and marine resources while maintaining its focus on safety and sustainability.

In line with these recent strategic partnerships, OceanPact has signed a contract with Wilson Sons Limited for the construction of four OSRVs, with a recovered oil storage capacity of 1050 cubic meter, a length of 67 metres and a beam of 14 metres. Built in Wilson Sons' shipyard complex in Sao Paulo, the vessels will be due for delivery in 2015 (first vessel) and will ensure OceanPact has the fleet in place to respond to any incident or emergency. O&G



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Hatek Lastechniek B.V. provides support to Breman Machinery for various projects by offering advice and therefore optimising the quality of welding and the welding efficiency. In order to expand the extensive knowledge of Breman Machinery on a personal basis and to help in terms of welding related issues, Mark van der Steen of Hatek Lastechniek B.V. can be found regularly in the workplace as a partner specifically for welding. This includes welding procedures, welding sequences, problem solving, choice of filler metal and practices.

Breman Machinery is a family owned, private company that makes components for the builders of machinery, engineering bureaus and industrial end equipment users. With clients that operate offshore, in the heavy machine industry and within the aerospace community, its database of industrial customers is extensive as well as serving the large players in the offshore market and international offshore companies. "We specialise in complex mechanical components. These are work pieces of high precision, often with extreme dimensions and weighing hundreds of tonnes but made to a precision of 100th of a millimetre. The key factor in our business is having the right people, and our workforce of 120 personnel is complemented by the complex machinery at our extensive premises," says managing director Henk Breman.

In recent years the business has progressively evolved into a role as a complete turnkey solution provider as Henk explains: "At the moment we are working on a project manufacturing large handling equipment for users in the wind farm industry. The equipment is designed to assist in the process of installing monopiles into the seabed but we have developed into a complete turnkey player in the wind farm market, the offshore oil and gas market and the heavy machine building industry. As a result, we are also busy manufacturing winches. Currently we are working on a 200 tonne abandonment and recovery (A&R) winch and a 25 tonne storage winch. We are involved in these projects from the earliest stages of developing the blank sheets of steel through to the complete and final delivery. We undertake all aspects from the co-ordination of the assembly such as rolling, welding, machining, milling and turning to function acceptance tests of the fabric. This is all completed in-house, under one roof before delivery to our customers." In a very customer driven market the business is serious about fulfilling all its clients' needs and thoroughly investigates all specifications before commencing any project.

"We aim to please our customers, and have built up a reputation for delivering difficult projects, with a short lead-time to a high quality. Our order books and project history demonstrates this market position with orders for large handling equipment, winches and locking systems for jack-up barges. The market for jack-up systems and motion compensated systems on the sea is busy for us," points out Henk. Last year the business made two very different kinds of investments, each with the common goal of placing the business in a future proof position. The RX18 is a very sophisticated machine with high-speed and very high accuracy, which is of benefit to the market as a whole with Breman Machinery equipped to provide very efficient machining work. "Working efficiently can significantly reduce lead times, and for us this is a very important issue. We also opened up a new facility at our site in IJmuiden, Breman Offshore bv, and for us it is a new opportunity to provide service to a new market. The location benefits from its proximity to the sea, and with a quay that is 12 metres deep and 300 metres in length, it is appropriately sized to accommodate large sea ships, opening up a new market from which we can provide new services to our customers," he continues.

The family run business has a wealth of strengths that keep customers returning. "The key strength is how you make the products. We have a lot of knowledge and experience in skilled manufacturing. Our customers design engineer most of the work but what is important is that we know how to make the products, we have a lot of experience across a wide variety of projects. Our company has existed for 150 years and that experience is essential," explains Henk. Utilising its experience, the company has produced an upending tool for monopiles up to 1000 tonnes. Having completed the envelope of activities in-house, it further demonstrates

the company's capabilities as a deliverer of new, single and innovative one-off specialist products to the market.

"We can bend up to thicknesses of 250 millimetres, but that depends on the width of the rolling work. You don't see many workshops in Europe with the combination of machines that we have and it is this combination that makes us stand out. The variety of functions assists us in producing special products in house. All the knowledge that we have is retained in-house and facilitates us in providing unique products to the field. Because our market has such a short lead-time and demands a high quality product, this position makes a difference and delivers an advantage over our competitors," Henk emphasises.

At the company's premises, it has the facilities to hoist up to 240 tonnes in four large construction and machining holds. Commenting, Henk says: "We have the capabilities to do the right job, the main challenge is delivering each job at the right time. Sometimes the work pieces are 750 to 1000 tonnes, and it is a very big challenge that we meet the delivery time and critically, the specification. Manufacturing large equipment to a very high accuracy of 100th of a millimetre, to a delivery of six months poses a potential hurdle."

To remain at the forefront of the industry, its workforce undertakes constant training as part of in-house schemes that maintain and improve the high level of workmanship. The training schemes cover welding, machining, programming, and logistics and is seen as a part of everyday employment to ensure success. As the business enters the second quarter of 2014, it continues to work towards becoming an established complete turnkey solutions provider with a greater international footprint. "Europe is our main market and we are looking to increase our presence and activity in Scandinavia, UK, Germany, Belgium and France. As a business that is still growing, we are very confident for the future. We don't have the goal to get bigger, but we do have the goal to get better. In the future we will invest in the newest technologies of machining for steelwork or composites, becoming even more of an efficient player, but right now we have a good level of machines and we are ready for the market," concludes Henk. O&G

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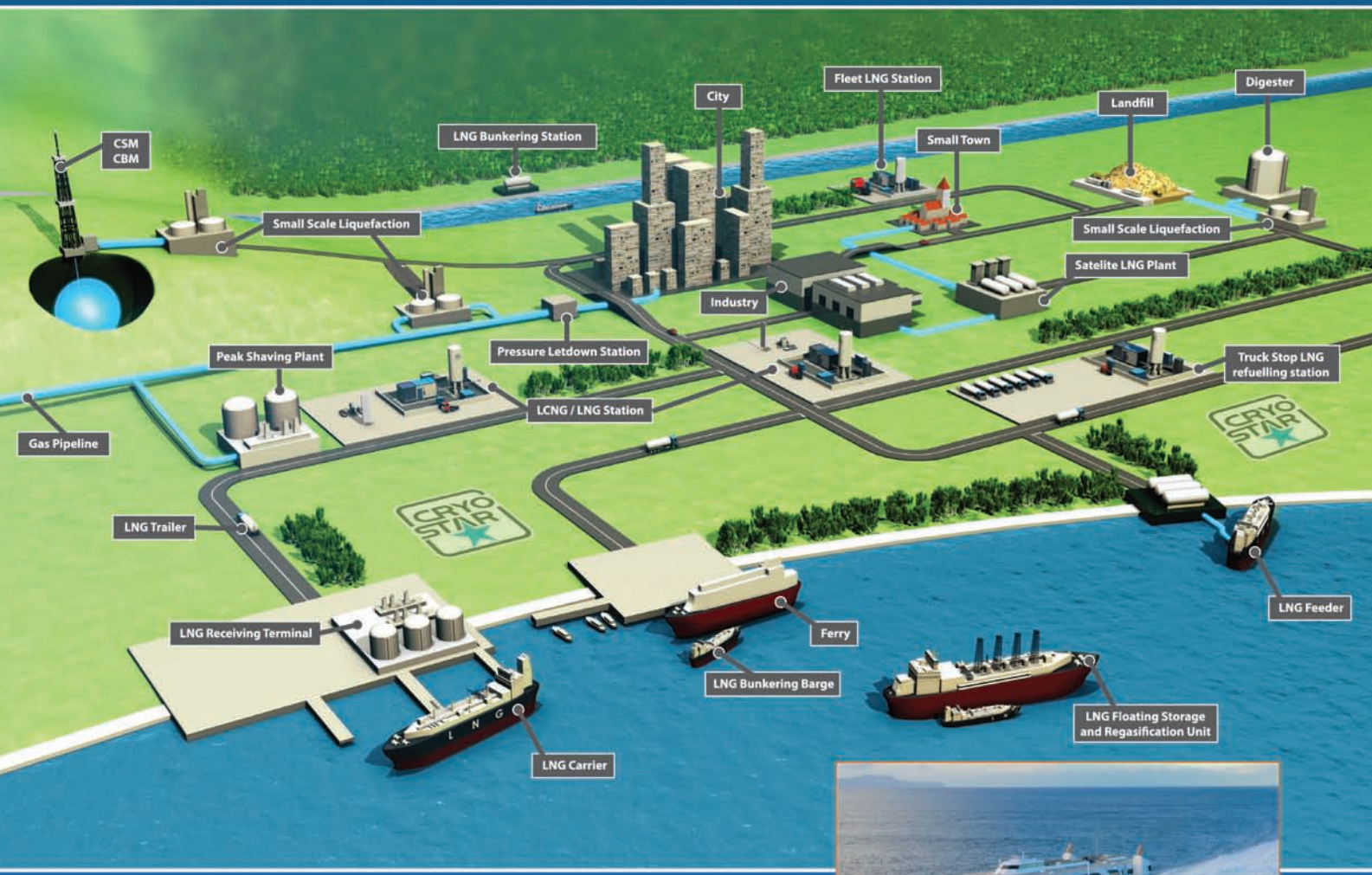


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Subtran submerged pump

Highlights:

★ Fully submerged design, allowing to remain in cold stand-by for immediate start
★ High efficiency design
★ Limited maintenance (no shaft seal)
★ Extended bearing lifetime (lubrication with LNG)
★ Designed in compliance with guidelines such as IGC 11/82 norm
★ 600 pumps already sold in the world
★ Can be used with other cryogenic liquids such as Ar or N_2

CRYO STAR

Expert in advanced technologies for Industrial Gas, Clean Energy, LNG and Hydrocarbon applications

www.cryostar.com

★ BRAZIL ★ CHINA ★ FRANCE ★ INDIA ★ SINGAPORE ★ UK ★ USA

Fuelling tomorrow

CRYONORM

Since its inception in 1968, Cryonorm is a major European supplier of cryogenic vaporisers. Next to customer designed units like steam heated, water heated or gas fired vaporisers, Cryonorm offers a standard range of ambient air heated vaporisers.
Over the years, vaporisers for air gasses like liquid Nitrogen and liquid Oxygen have shown stable and steady business. A strong upcoming market segment for Cryonorm is on regasification of liquefied natural gas (LNG), for which Cryonorm also offers a full range of regasification units.

Below
Lars Persson, managing director Cryo AB

When it comes to LNG and cryogenic equipment, Cryo AB can rightfully be considered as a market leader and in a prime position to develop the liquefied natural gas (LNG) systems of tomorrow. The company produced its first storage tank during the 1950s and has since continued to develop cryogenic equipment for the storage, transportation and handling of liquefied gases as LNG increasingly develops as a fuel source.

Cryo AB operates as an independent company owned by the Linde Engineering Division, which enables it to take advantage of several key benefits, as managing director Lars Persson elaborates: "We have direct access to leading experts in the cryogenic field. Having a strong mother company also enables us to go for larger projects, which wouldn't be possible without strong financial backing. Linde also has global functions such as construction, manufacturing and procurement so we gain synergies in many fields. We are a relatively small local operator, so this opens the door to many global markets."

The company is based in Gothenburg, Sweden from where it has developed a strong base of experience through operation in the Scandinavian and Nordic countries, where it continues to lead projects today. During 2011 for example, it completed Sweden's first LNG receiving terminal and is in the final stages of delivering a second project in the country as Lars explains: "This is the second LNG receiving terminal that Cryo AB has built in Sweden and in terms of magnitude it will be the biggest on completion. We achieved mechanical

completion of the plant shortly prior to writing and commissioning will follow soon. We are aiming to handover to Skangass this summer. We also see opportunities for other upcoming projects of this size in Scandinavia, so this will serve as a good reference for those."

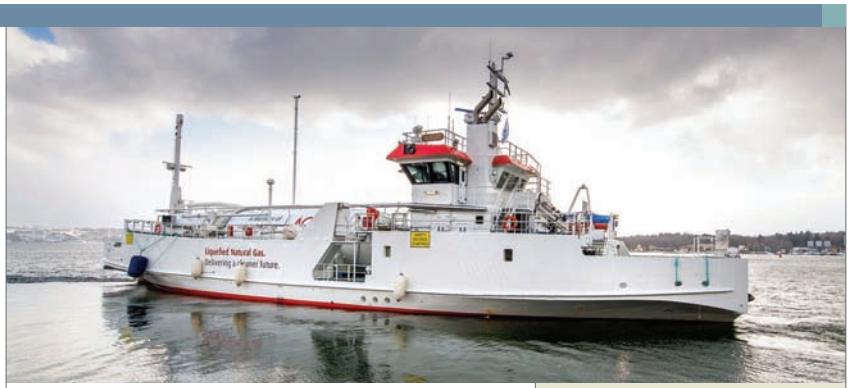
The expertise of Cryo AB has enabled it to enter into a number of markets that often overlap with the oil and gas industry. To date it has serviced customers operating within the oil and gas and transport, chemical, shipping, submarine construction, biogas production and engineering industries. A significant milestone

for the company was the delivery of fuel systems for the world's first LNG powered tugboats. The boats were ordered by the Norwegian marine services company Busér og Berging AS and were put into operation during 2013.

The design of the LNG fuel system is compact to minimise the space required for installation aboard ship. The advantage of this is that other small vessels aside from tugboats can be designed to operate using LNG as the sole fuel source. The total volume of the tank used in the system's design is 86m3 and the tank is also vertically standing, which serves to limit the physical footprint of the design. The adjoining cold box installation, containing all of the equipment needed to operate the system contains two identical systems separated by a barrier wall. Again, the main advantage of this is space as the design allows for the required 100 per cent redundancy required for operation without the need for another space consuming tank.

"This is a unique system that enables the boat to purely run on LNG, as opposed to a dual fuel set-up, and therefore minimises the need to carry different types of fuel. The solution has been of interest for smaller coastal vessels such as tug boats and passenger ships, as its the first time that they have been able to exploit this fuel, so we expect this to grow further," Lars explains.

Indeed as well as delivering the first LNG fuel systems, Cryo AB also delivered another world first in designing and building the tank and bunkering system for the first LNG vessel for ship-to-ship bunkering. The vessel went into operation during 2013 in Stockholm Harbour, Sweden where it has distinguished itself exceptionally well. Shortly prior to writing Cryo AB received an order for a LNG powered



icebreaker, which will be the largest largest vessel the company has delivered with a volume of 400m3. The LNG fuel system aboard the vessel will also be the largest marine LNG fuel system delivered by Cryo AB to date and will represent an impressive milestone for the company.

Although the maritime industry is currently showing clear signs of major opportunity for the growing LNG market, Cryo AB has a proven history of trading in a host of markets and has established itself as a leading partner that is able to deliver both quality and expertise as Lars elaborates: "We have extensive cryogenic know-how having been present in the market since it began. The combination of this with our core technology and production capabilities gives us a very strong position. We also focus on offering complete solutions to the client including aftersales services such as education, maintenance and support."

During the rest of 2014 Cryo AB will focus on completing its current contracts as well as tendering for the emerging opportunities within the Scandinavian and Nordic regions. The LNG market is one that is bristling with potential and with its first-class service level and reputation for industry firsts, Cryo AB is set to continue as a key player in the LNG market of tomorrow. OSG

EUROPEM

With over 200 references in 15 years, Europem has become a world player in combustion and energy technology. This was recognised by Skangass/Cowi and Cryo (Linde group) who selected Europem's technology for their Cryogenic LNG Derrick Support Flare.

The contract was obtained via our Scandinavian partner Euromekanik. Their thorough knowledge of the local rules and regulations gave Cryo the confidence that the design would be in strict accordance with local regulations.

The timely delivery of the flare system and one week erection time was made possible by using 3D-design models, strict quality control procedures, a modular design and pre-erection in the workshop.

Cryo AB
cryo.se

Services
Cryogenic equipment

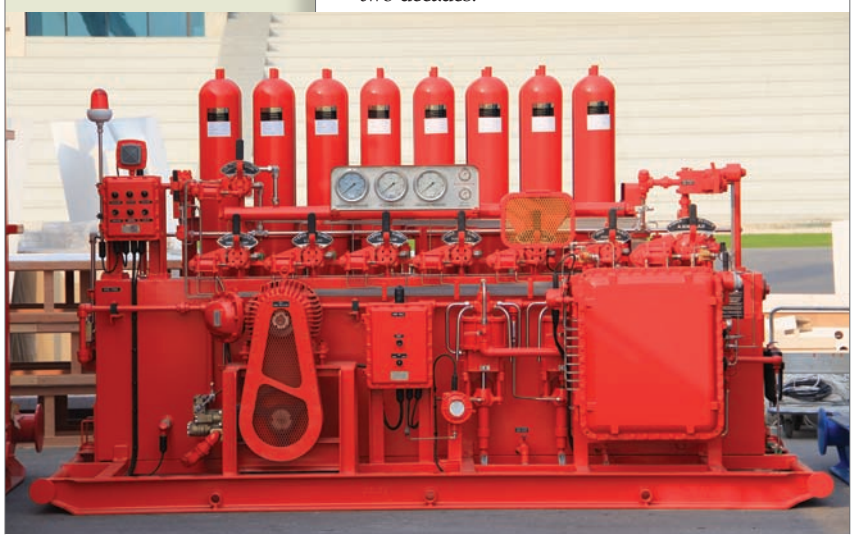
Leader of the pack

GDS-ME (GLOBAL DRILLING SUPPORT)

GDS-ME (Global Drilling Support) has teamed with Top Oil Field Industries to professionally support the Top Drive needs of our Middle East clients for rig repair and refurbishment. Based out of Dubai, GDS-ME specialises in parts, field service and recertification compliance. GDS-ME is a 24/7 worldwide one-stop-shop for all makes and models of Top Drives. This high standard extends to our own innovative line of Top Drives, the GDM (Global Drilling Machine). These next generation, performance-focused Top Drives are available in 250 ton through 850 ton.

The Top Oilfield Group was established in 1995 and during the time since has developed into a consistent and reliable service centre for drilling contractors operating in the Middle East. The company was itself founded by professionals with a wealth of experience in the oil industry with expert knowledge of the environment, problems and demands, which its clients operate within. The company has consistently offered a wide range of services and skills designed to ensure that clients could always be assured of a complete and excellent level of service.

From its headquarters in Sharjah, UAE the provision of quality driven drilling rig refurbishment services features a full range of specialised in-house services, which has extended its value for money strategy to every customer. Top Oilfield is dedicated to upholding the same high standards of quality craftsmanship and customer relations today as it has for almost two decades.



The services of the business include manufacture and refurbishment, new build and commissioning, repair, overhaul and packaging of oilfield equipment, re-builds, rental and technical field support. Its services extend to cover drilling equipment and associated parts supply and rental and the supply, overhaul and repair of industrial diesel engines. “In line with our philosophy of continuous improvement, over the past six months we have strengthened several key areas of our operations, specifically in respect of our field services team, manufacturing production processes at our central workshops and supplier base.

“We are active in three main areas of the oil and gas industry. Land rig new builds and refurbishment, drilling equipment manufacture, supply and re-certification and technical labour supply. We offer our services and products throughout the Middle East, India and beyond where all equipment, including new and reconditioned land drilling rigs are backed up by locally available after sales service teams,” explains Ian Midgley, managing director.

The business is currently undertaking the complete refurbishment of two land rigs, scheduled for completion within the time frame and to the budget required by its customer. As part of an order for six land rigs, the remaining refurbishments will be completed before the end of the year. With the capacity and demand to undertake several contracts at any one time, Ian says: “We continue to provide on-site support to various major drilling contractors who are active in our operating regions both onshore and offshore. Our field engineers and technicians are in great demand at present and we are keen to ensure that we maintain our ability to meet our customers operational needs.”

In its 19-year history of manufacturing, upgrading and repairing BOP control units Top Oilfield has built up a significant product line. “Due to the large volume of orders we are receiving for new build units, we have responded by developing a production line approach to the manufacturing process. This will provide our customers with quicker lead times and, due to the cost reductions associated with this manufacturing methodology, our prices will also be even more competitive. As with all our product offerings, all units we supply are fully supported locally after delivery. We believe that in terms of reliability, performance and price, Top Oilfield BOP control units are world-class.”

As a response to the challenging environment

of today's market the business is also further strengthened by many other qualities, as Ian points out: "In addition to our API certifications, API 16D, 4F and 7K and ISO 9001:2008 accreditation, Top Oilfield has exceptional tradesmen, facilities and an ethos of responding to our customers' operational needs and reliability. As a privately owned and managed company, we have the flexibility to swiftly change our own operations to ensure that our products and services are appropriate to those required in our industry.

"We are an attractive proposition for companies who are seeking new build or refurbishment and recertification to rigs, due to our regional experience, knowledge of rig specification requirements and operating conditions. We are also happy to work in partnership with our customers and have the flexibility to offer rig packages which both meet specification and available budgets. We have developed a 1500hp land rig package, which is highly mobile, providing the highest standard of performance and is sensibly priced to ensure maximum value for money. In addition, as previously noted, our field service engineers are available locally and quickly in order to provide full after sales support."

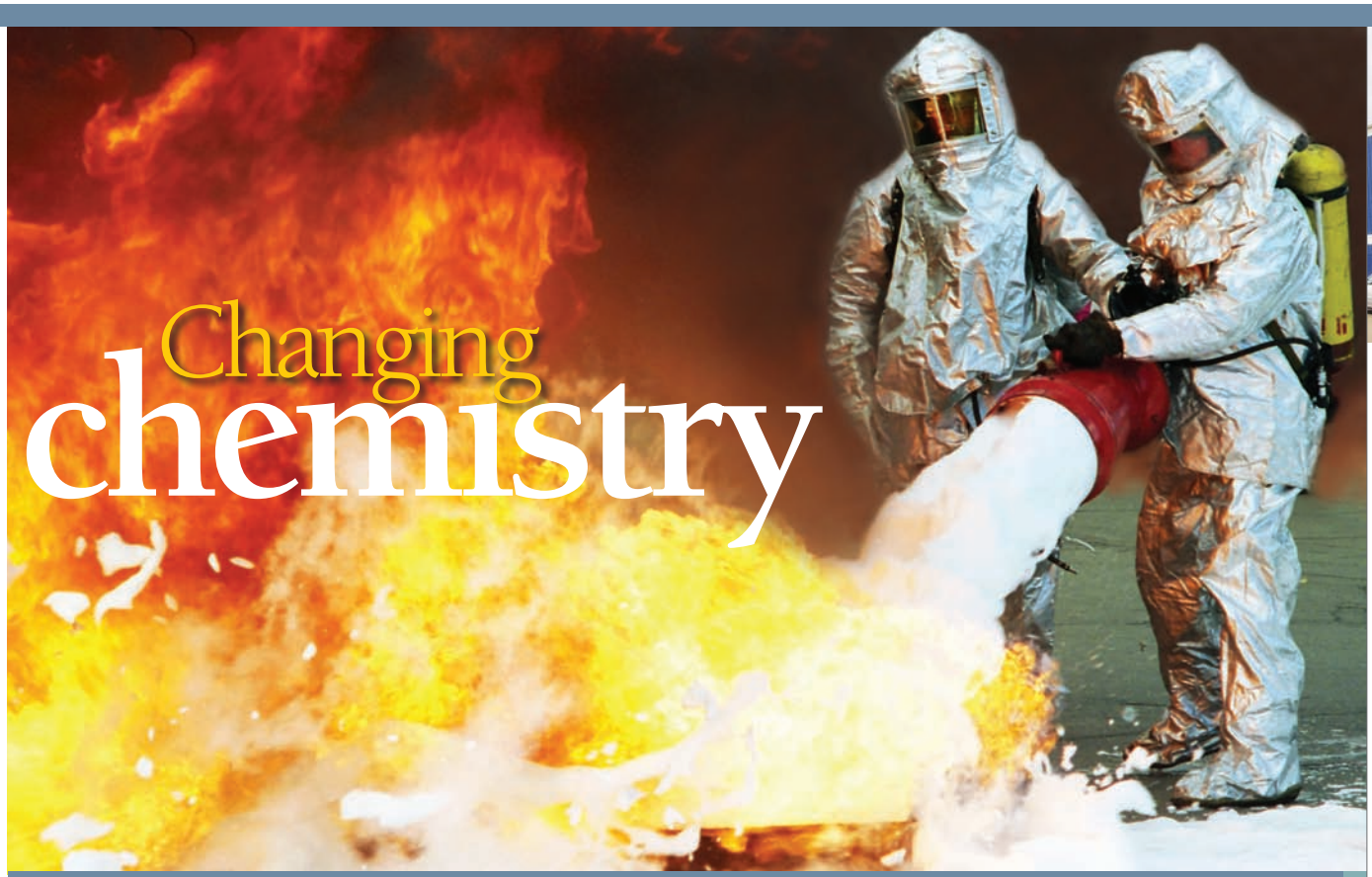
With the demand for oil production in the region remaining high, the ongoing requirement for drilling rigs and associated equipment and services is also strong. "The problems which certain Middle Eastern nations are facing in respect of the Arab Spring, coupled with an apparent upturn in the industrial activity being experienced in the West, would indicate that the market will remain this way for some time to come," explains Ian. Looking towards the future, he concludes: "Our focus, as always, is to continue developing our business and ensuring that we are aligned with the needs of our customers. Our ambition is to provide high quality, high value and competitive products and service lines, which will make Top Oilfield the first choice partner for drilling rig contractors operating in the Middle East." OGG

> Top Oilfield is dedicated to upholding the same high standards of quality craftsmanship and customer relations today as it has for almost two decades

Top Oilfield Industries Ltd
topoilfield.com

Products
Oil rig support and maintenance solutions

Changing chemistry



"We are a manufacturer of fire-fighting foam and equipment, providing products through research and development, manufacturing and sales throughout Scandinavia and exporting to Europe, the Middle East, Asia, Africa, and the US," says John Olav Ottesen, managing director. Since 2001, Dafo Fomtec's products have, through a global sales network, heavily supported the oil and gas industry. For the market that handles, stores and produces large quantities of flammable liquids, foam represents the primary fire-extinguishing agent.

"We have developed organically over the past decade, gaining new market shares and distribution networks, and broadening the range and depth of our products to successfully reach new markets. All our products are driven by approvals and documentation, which must be obtained in order to enter a more demanding market. Our research and development (R&D) department plays a major role in this area," highlights John.

The importance of R&D is represented by the reinvestment of a vast majority of profits into product development, as John says: "It is very much a significant part of our business. Our products are categorised under fire-fighting foam, but there is a huge variety of different kinds of foams, suited to different kinds of flammable liquids, systems and applications. We have ongoing research and development projects creating new products, either to support entry into new markets or to enhance the performance of existing products. Close attention is paid to enhancing the environmental profile, and all our concepts look towards the future with lower cost and improved technology."

Over the past 18 months Fomtec has supplied its products to airports throughout Turkey and FPSO builds in Korea amongst many other ongoing contracts with oil companies. With major interests in the Middle East, particularly in Saudi Arabia, supplying to the civil defence market, it also covers Iraq, supplying across the country through local distributors. "The key to our success has been customer focus, demonstrating dedication in responding quickly to enquiries with short lead times and high quality products. We have constructed our

business in a very dynamic way and, being hungry to succeed, we work very closely with our distributors and customers to generate solutions and business," explains John.

One future product that Fomtec has been actively involved in is the development of fluorine free foams as John details: "We have a portfolio of fluorine free foams, which in testing has achieved a very good fire rating. However, the market in general still uses fluorinated foam because it carries the heaviest approval. At the moment only a very small part of the market actually demands fluorine free foam."

Recognising the employees behind the developments, Fomtec continually seeks to secure new talent within its company. "We have a very clear focus on the customer, and our tenacity is one of our main strengths. We simply keep on pushing, and we are looking for people with the same mind to invest in. Our business is very complex and every contract is unique with challenges involved in all of them. To secure a contract we are willing to go the extra mile, seeking new approvals, and even develop new products to meet customer demands, so the right personnel is a very important aspect of our business," John points out.

The business recently added a further five UL (a globally respected independent safety science company) approved products to its portfolio and intends to add another range within the next 18 months. In the later quarter of 2013 the business supplied a large quantity of product to the Jordan Petroleum Company. "It was a new product covered by stringent batch approvals," says John, continuing: "To actually get the order, we first had to produce the entire batch. The customer, together with a third party, then took samples of the product for site testing, extinguishing several large fires to prove that the product will work."

Although the process in itself is not unique, the production of the vast amount of foam and the quality of the product, tested over 15 large fires, was a milestone for the business that it is very proud of. "We have a high level of confidence in all our products. As with all our projects, we had undertaken a lot of pre-testing so we knew it would pass, but nevertheless, it is always nerve racking to have so much at stake under test conditions," explains John.

In the industry today, there is a change underway, a change in chemistry. Fluoro-chemicals are at present based on a C8 carbon chain molecule, and that is now changing to a C6 carbon chain molecule. "Over two years of research have gone into making this possible and it is a major step that the whole industry has to take. For us, this changeover will be completed within 2014. Aside from technological advancement, our aim is to be recognised as a global player within the market and a highly respected brand of fire fighting foam. In terms of growth we hope to double our size in the next five years, establishing ourselves as a really highly trusted brand name. We know where we want to grow but we aim to continue in the organic way which has aided our ongoing success," concludes John. OEG

In the industry today, there is a change underway, a change in chemistry. Fluoro-chemicals are at present based on a C8 carbon chain molecule, and that is now changing to a C6 carbon chain molecule

Dafo Fomtec
fomtec.com

Products
Fire fighting foams and equipment

Flexible future

RENA CASTINGS B.V.

Rena Castings B.V. is a high pressure diecasting company that specialises in components for the gas industry. HSF is one of our customers that we support with our knowledge of the diecasting process and the production of these kinds of components (gasmeter bars). We provide the complete package of services from development of these parts in 3D up to fully automated diecasting, CNC machining, assembly processes and leak tests in our company. Rena Castings is an ISO-TS16949 certified company.

HSF was founded in 1966 producing metal and brass valves amongst other parts, which were sold to water and gas companies. As the business developed, its client base grew to incorporate network companies throughout Holland. "During this time we began delivering systems and complete water meter packages to connect the main water supply to the house. We also developed solutions for gas and today have a complete package offering water meters, valves and couplings for PE, essentially providing installation solutions from the mains supply to the internal house installation. Since 2000 HSF is one of the Flow Control companies of Aalberts Industries, an internationally active specialist in industrial products, systems and processes with high-quality technical knowledge.

"We also offer solutions for district heating to several network companies in Holland, pre-fabricated gas connections for surface lines, and also for district heating such as the thermal interface units." The business is particularly busy within Holland, but also in Belgium and Luxembourg. "We are now expanding throughout Europe focusing on the UK, Germany and Scandinavia, with the various aspects of our specialities, one of these being the thermal interface units, but we are also looking for business opportunities within our gas segment," says Emiel Woestenberg, product market development manager.

The humidity level of the soil in the west of Holland is very high due to its position below sea level. The result is that areas of the country are continually sinking. The solution for the construction, as in Amsterdam, is the use of pile foundations, but services buried in the ground are subjected to moving as the ground shifts as Emiel highlights: "The PE pipe in the ground to the house, will over time, also sink and in a few years it will break, resulting in a leak. For this problem we developed a flexible prefabricated unit, which will cope with sinking ground and height deviation between the house and the main pipe in the street."

The development has been a major step in safety, particularly with regards to providing a solution for the prevention of dangerous gas leaks, offering the customer peace of mind. "There will be no problems with the gas service line and no maintenance requirement for the gas service pipe. Every 15 years the pipe work can be raised to a higher level knowing there is no safety issue. The prefabricated gas connection system, is an extremely important design, and will be in demand throughout the Dutch market. We see the popularity of the design growing in the Belgian market and in Europe, where the benefits of a pre-fabricated gas connection will be significant," adds Emiel.

The business has its own development department with a great deal of experience in the gas segment, and its own production and laboratory facilities for testing. "We are able to manufacture a variety of metal components such as metal brackets and have the ability to make our own injection moulding components. We are able to produce many components for pre-fabricated gas systems in house. This makes us very flexible and is supported by the vast knowledge of the products, what we can make and how we can make it," Emiel highlights. HSF has additionally secured strong working relationships with suppliers such as

Rena Castings BV, which specialises in the production of the aluminium die casting tubes within its products.

Determined to develop innovative solutions, HSF spends time with its customers, listening to the problems and challenges that they face. "There is a reduction in the number of houses that are connected to gas as electrical heating increases. The challenge for us is increased by the demand for the total cost per connection to decrease with an overall low total cost of ownership. Our challenge is to design systems and innovate products that contribute to the total cost of ownership through ease of installation, but also that are maintenance or service free.

"Innovation is our major focus at the moment as we look to further develop systems to face these challenges. This short-term focus addresses the challenges in the local market but we will also seek opportunities in the export market. As a company we see that we can provide a real benefit for other networking organisations in Europe that face similar problems," says Emiel. Extending beyond the geographical area of the Benelux region in which it is already well known, the HSF name is highly reputed in other countries, with a reputation for expertise and innovative products. "We are co-operating with other parties and networking companies in Europe, to develop systems for their market. Our expertise is specific to all nature of gas work such as biogas and natural gas from the service lines to the house, and other installations but can also be used on systems for transport or connection components," he adds.

Drawing to a conclusion, Emiel highlights the future plans for the business: "We are developing new systems that will further decrease the cost of ownership, and overcome logistical complexity for networking companies. Current developments are at the eve of being implemented now and we have carried out successful pilot projects. For some of these systems we see big opportunities in other markets, like the UK, as well." O&G

HSF BV
hsfbv.nl

Products
Innovative gas and water supply products

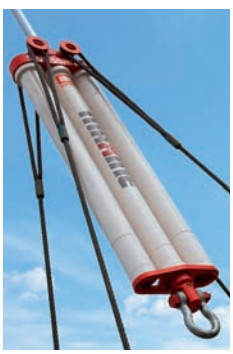
Making movements possible

For close to 60 years IHC Vremac Cylinders BV has offered expert solutions in hydraulic cylinders and has developed a leading reputation in a variety of markets. Gerrit Venderink, who began the business with only four members of staff, founded the company in 1958 and today the company has grown to employ a workforce of 110 people. The business is based in Apeldoorn, the Netherlands from where it has operated for the past 50 years. The name Vremac is an acronym of Venderink Repairs and Machine Factory and has become synonymous with market-leading design and manufacture. So much so in fact, that during 2007 Vremac became part of the IHC Merwede Group after operating as a trusted supplier to the company for many years. The strategic decision to transition Vremac from client to part of the IHC Merwede Group is indicative of the reliability of the solutions provided by the company and today, Vremac hydraulic cylinders are essential components within the hydraulic systems sold by IHC Merwede worldwide.

During the company's early years Vremac was solely focused on the repair of cylinders for a host of industry sectors, before market demand prompted Vremac to move into the repair and manufacture of hydraulic cylinders as well as presses, accumulators and other products in both standard and bespoke models. The industries serviced by the company today include dredging, offshore, civil engineering, heavy machinery and recycling and demolition, providing Vremac with a diverse market base and stability advantages.

More than 50 per cent of the work undertaken by Vremac is centered within the oil and gas industry for clients in Europe and around the world. The harsh conditions that accompany operation within offshore and subsea environments present a challenge to operators that can limit the operational window and lifetime of costly lifting equipment. Vremac provides solutions that allow operators to continue to work where it may otherwise not be possible, as sales manager Jacco Lemmen explains: "During the last two years we have developed a Passive Heave Compensation System (MaXine), which makes it possible for cranes to operate within a wider weather window, meaning with higher sea states and stronger winds."

The system is called MaXine and has been specifically designed for offshore operation, where challenging conditions are regularly encountered. To overcome the problems caused by the oscillation of waves when hoisting or lowering loads, the MaXine range of heave



compensators can be positioned between the crane hook and the load to keep the rope taut at all times. The system reduces the peaks and troughs caused by heavy sea states by following the roll of the ocean, which crucially allows work to continue safely and in a controlled manner. The design of the MaXine system incorporates several features that make it an ideal solution for operators seeking to increase the possible scope of operations in harsh environment. For example, it offers independency from special heavy lifting equipment that results in a significant cost reduction in exploration when combined with the increased weather-window. The system is also exceptionally diverse in that it can be applied to all crane types and does not require special lifting frames or an external power source. MaXine also features compact design that can be applied both above and underwater, making the unit suitable to a host of applications where sea states or wind conditions compound lifting operations. Furthermore, the system is diverse enough to offer remedies to additional problems that are sometimes encountered during crane operation. For example, through the application of an external power source it is possible to boost the rate of an otherwise slow hoist speed. It is also possible to exercise multi-step transfer to combat low shock absorption levels.

IHC Vremac has designed a range of MaXine heave compensators that are capable of handling weights between 25 and 500 tonnes. The effectiveness of the system was demonstrated through a series of tests carried out in the harbor and at Vremac Cylinders' headquarters, in co-operation with Biglift and Mammoet. A 12.2 tonne crane utilised the MaXine 50 unit to hoist a heavy plate from ground level. The crane's hoisting ropes were gathered together into a single shackle, which was connected to a quick-release hook that was in turn welded to the plate itself.

The hoisting of the crane led to the extension of the MaXine 50 in much the same way as a spring and when the quick-release hook was activated, the MaXine contracted and the plate was pulled upwards. The hoisting speed, height and combination of natural frequency and damping were all important parameters highlighted by IHC Vremac and the first three successive demonstrations were measured and proved to be exactly correct, a clear indication that the MaXine 50 is fit for purpose.

"We received some useful feedback from the crane driver, who was initially sceptical about

the demonstration," says Jacco. "However, his opinion was transformed when the hoisting of the deadweight ran so smoothly. The energy generated by lowering this weight was successfully consumed by the acceleration of the remaining load and the weight of the MaXine 50."

The company's years of experience, and the initial market research carried out by Vremac at the beginning of the MaXine project, suggested that operators rely on specialised heave compensation equipment sporadically for periods of between a few weeks and two to three months. This in turn meant that clients were interested in finding a cost-effective rental solution rather than buying systems outright and this has become the strategy adopted by IHC Vremac in marketing its new design. "We have invested in a range of MaXine systems for the company's rental fleet," explains Jacco. "The main purpose is to increase the cranes' weather window and allow them to work with higher sea-states so that crane and load will be handled safely. The client does not need to make any adjustments, it is possible to simply use the system and it will decrease the forces acting on the crane and increase the weather window safely to sea state 3 (Northsea)."

Next to the MaXine developments major cylinder projects are passing by: "Winning a large tender, which includes 32 hydraulic cylinders for the existing Panama Canal, which were delivered in 2013 and installed early 2014 was a next step in becoming a well-known global supplier," says Jacco. "Rolling out the international strategy is an exciting time for the company. We are also displaying the MaXine system at various trade shows to increase the product's visibility outside of the Netherlands and working to increase the size of its rental fleet to meet the requirements of its clients." O&G

> During the last two years we have developed a Passive Heave Compensation System (MaXine), which makes it possible for cranes to operate within a wider weather window, meaning with higher sea states and stronger winds

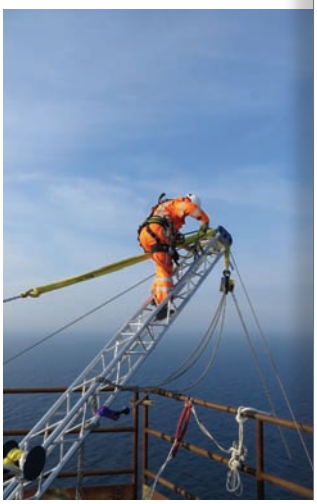
IHC Vremac Cylinders BV
ihcvremac.com

Services
Hydraulic cylinders, swivels and accumulators

Super movers

Above
Load test of modular flare tip handling system with tube components

Below
Single pole flare tip lifting system installed offshore North Sea



With origins as a structural engineering company dating to 1993, in the last five years Conbit has developed its expertise as a special lifting company. The duelled approach is a distinguishing factor in the market, and as a privately owned business operating from Eindhoven in the south of Holland, its flexible approach is shaping a fulfilling future.

"Our special lifting projects are mainly focused on the offshore industry where we perform turnkey projects in a process that begins with engineering and continues through to final installation and completion of the project. We organise the crew, the equipment and every aspect of the operation," begins Bramvan Oirschot, sales manager. The structural engineering division supports the special lifting crews whilst also undertaking specific projects that focus on demands such as lifetime extension analysis, heli-deck recalculations and design of jacket support structures.

"We have witnessed a growing demand for lifetime extensions in the North Sea over the past 12 months. Platforms are designed with a life span of 20 to 30 years, and as these structures near the end of this period operators are looking to extend the lifetime. This has resulted in the demand for structural analysis, a speciality for our engineering division. Additional workload is coming from Western Africa, the North Sea and South-East Asia for the lifting of modules underneath deck structures such as helidecks or weather decks. The demand for our special lifting techniques is coming from any location that a regular crane is unable to reach," Bram points out.

In particular demand is its flare tip handling service, which is divided into three portions, the first being traditional flare tip replacement as a result of an existing flare tip burning out. "Requirements for material handling to be incorporated into the design of the new platforms and new FPSO's has also grown and we have developed a dedicated flare tip handling system for this purpose, which can be supplied as a complete kit for future operation. We can also assist the manufacturers of flare tips to offer them a handling solution for future purposes," explains Bram.

Previously, the replacement of a flare tip was carried out using a helicopter and in some regions of the world this is viewed as the only method of replacing a flare tip safely. Highlighting the difference Bram says: "With our system, it is a mechanical, temporary system just for the replacement of the flare tip. This method has developed from the early innovation to be just as efficient and safer than the helicopter replacement method. Introducing this has been the biggest challenge faced over the last few years but it is now quickly gaining ground. It is an alternative approach to the flare tip handling that is interesting for operators in the offshore and onshore industry."

Since the business entered the special lifting market, it has increased its fleet of

equipment and grown its crew. The rapid growth, through a combination of structural engineering and real operation in the field has been a real milestone. "We have been growing tremendously over the last couple of years and have moved to new premises employing over 50 engineers, technicians and team leaders. We have established good relationships with the universities in Holland targeting future civil and offshore engineers. Beside that we have a growing base of foreign employees from Europe and Asia," says Bram.

Operating with a strong no nonsense culture within the organisation clients are drawn to the trustworthy company. Commenting, Bram says: "We always like to give out a clear message. During a project there are always challenges that arise but we try to overcome them with honesty and an open line of communication towards our clients, and that is appreciated. As a business we are still expanding and the engineering capacity will continue to grow steadily while the main area of growth will be related to offshore platform modification. By increasing the number of technicians and team leaders, we will be in a position to act on these opportunities."

Looking further ahead, Bram says: "We will be developing more and more into a real transport and installation company with the structural engineering bankground and special lifting as combined aspects. Taking more of a turnkey approach, we aim to be able to take on a newly manufactured module and transport it directly from the manufacturer to the quayside, and onto the installation offshore. That is where we see that we are going to develop in the next few years and this will require growth from all aspects of our business, from the project management side, for logistics and for the engineering and field operations.

"Our lifting solutions use lightweight components to lift quite large modules up to 80 or 90 tonnes. The lifting system configuration is assembled from regular truss system or aluminium tubes and is operated by sophisticated lift winches. This is where we have the added value as we are trying to eliminate the use of large crane vessels. Our main focus at the moment is promoting ourselves as a good alternative to the crane vessels." OEG

HYDRAURENT

HydrauRent is a brand of Hydrauvision Rental, offering temporary solutions with hydraulic power, lifting capacity and/or maintenance of hydraulic systems. Conbit hired the HydrauPack 200, a 5ft container size powerpack with 200kW for operation on an offshore platform. Also the HydrauWinch was used for lifting. Equipment is approved according to DNV 2.7 regulations and has a high standard in engineering, production and operation. The units are designed and built by Hydrauvision itself. With its headquarters in Schoondijke, the Netherlands, and premises in IJmuiden, Dordrecht, Ghent, Yerseke and Zeebrugge, the company offers systems, services, components, rental and piping, all related to hydraulics.

SLB HIGHTECH

SLB HIGHTECH is a Dutch sheet metalworking company specialised in made-to-measure products for discerning industries. Commissioned by Conbit, it manufactured the aluminium components for a flare tip handling kit; a critical piece of equipment that allows future flare tip replacements with a system that is available in the operator's warehouse. Naturally SLB HIGHTECH took care of the welding work in accordance with EN 3834-2, material certificates are available and all processes are verifiable and controllable.

Above
Lifting accommodation module directly from supply vessel underneath weather deck (offshore Libya)

Conbit
conbit.eu

Services
Structural engineering and special lifting for offshore

A higher level

ENERPAC

Integrated Solutions - heavy lifting

Enerpac's Integrated Solutions division provides high force system solutions to meet customer requirements for safe, precise control of movement and positioning. With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of structures.
In addition to providing the most comprehensive line of globally supplied, locally-supported products, Enerpac combines hydraulics, steel fabrication and electronic control with engineering and application knowledge, to design and manufacture solutions that ensure your projects are completed safely and efficiently.

Founded in 1983 by Roger Harries, ALE has risen to hold a commanding reputation in the field of heavy lifting, transport and engineering. The company was last featured in *European Oil and Gas Magazine* (EOG) during July 2013 when it was reported that ALE achieved several impressive feats including what was the world's heaviest jack-up of a topside module at Daewoo Shipbuilding and Marine Engineering Co. Ltd, Korea.

Following the success of the lift that eventually led to deployment of the Arkutun Dagi Topside for Exxon Neftegaz Limited, ALE was credited with the 'Contractor of the Year' award for excellence in safety performance. Exxon Neftegaz awarded the prize to ALE after observing its execution of the projects with three criteria defined as safety embedded in system design, management commitment and leadership and worker involvement and ownership throughout the project.

The award was presented at the annual Sakhalin 1 Contractor SSHE Forum in Yuzhno-Sakhalinsk, Russia and was a significant moment in the history of the company, as executive director of ALE Kees Kompier elaborates: "For us at ALE safety is very important, as it is throughout the industry. This is something that we are always pushing forward not only through the training of our own people, our control and safety systems and auxiliary tools, but also though the training of all on-site personnel and site management. In short, the whole project chain. From our perspective the company's work has been seen by one of the world's major oil companies, which places safety as number one and has recognised our commitment in getting this right. Obviously a lot of time and effort goes into this and it is a great feeling to know that we are on the right track."

With several successful projects and accolades behind it ALE is showing no signs of pressure at handling some of the world's most challenging heavy lift and transport projects. Indeed rather than resting on its laurels the stellar reputation that precedes ALE has allowed it to continue to engage some of the energy industry's most highly publicised heavy lift operations. During January 2014 ALE completed the lift and install of a topside module weighing 10,000 tonnes at DryDocks world in Dubai, named the DolWin. Continuing in its traditional of unique operations, the DolWin is the world's largest HVDC (high voltage direct current) platform and the first to be mounted to a semi-submersible hull.

The lift called for the use of a specially developed gantry that was manoeuvred into position to lift the topside platform at total of 52 metres to allow for the insertion of the semi submersible hull for welding. A special gantry was designed by the ALE research and development team based in Breda, Netherlands and a further four laced tower systems and two A-frame structures were also used to enable the lift. Finally, side braces were positioned via pre-cast concrete foundations within the dock pier walls to stabilise the operation and provide a ballast securing solution to account for bad weather. Commenting on the operation, Edward Talbot project manager at ALE said: "For our

client this was a first and as such, a lot of design work, verification and detailed checks were completed to ensure full integrity of the entire system during the operation. Our aim was to execute the lift efficiently with minimal risk to the topside and surrounding yard activities. Usually a lift such as this would rely upon a very restrictive weather window requiring extended periods of relatively low wind speeds to affect the lift and integration safely. The design of the gantry and surrounding system meant that our client could not only perform the mating operation inside the dock, but also maintain adjacent docking operations with minimal impact to the yard facility during and after lifting and mating completion."

The strength of ALE to meet the unique challenges of its clients is rooted in its ability to deliver innovative new solutions and equipment to match the growing requirements of the oil and gas, renewable, yachting, nuclear and petrochemical industries that it serves. One such development since the company's last appearance in EOG has been the development of the Hydro Deck by the Australian consortium AG&P ALE Ventures Pty Ltd. Developed through the combined expertise of ALE and AG&P, the Hydro Deck is a mobile pontoon that works in conjunction with a modular offloading facility to allow load-in operations for combined loads reaching 17,000 tonnes regardless of tidal conditions. The first Hydro Deck will be deployed in Darwin, Australia and features a catamaran design and an innovative redundant water ballast and air tank system to provide buoyancy and account for rapid tidal variations.

As ALE continues is journey into 2014 and beyond it will continue to rely on and expand its impressive portfolio of equipment and services to maintain its position as the industry leader in heavy lifting. With over thousands of large structures delivered and installed since the 1980s and impressive hardware including the world's largest land-based cranes, Mega Jack and Hydro Deck, ALE is set to reach even higher levels well into the future. OEG

> The strength of ALE to meet the unique challenges of its clients is rooted in its ability to deliver innovative new solutions and equipment to match the growing requirements of the oil and gas, renewable, yachting, nuclear and petrochemical industries that it serves

ALE
ale-heavylift.com

Services
Heavy lift transport and engineering

Setting standards

Formed in Kazakhstan in 1998, FSDS has developed a solid reputation as a provider of subsea services in areas such as the Caspian Sea, Black Sea and Sakhalin Island over the last 16 years. With a broad spectrum of expertise in subsea activities from simple vessel husbandry to more complex subsea construction projects, the company is relied upon for its capabilities by oil and gas majors including Shell, Exxon and Petronas, and the Kashagan field development consortium. "FSDS was established to support the development of the Kashagan project in the Caspian Sea and was originally a joint venture between Frazer Diving and a local entrepreneur with a firm called Sak Diving. Originally the joint venture was called Frazer Sak Diving Services, until the local entity brought out Frazer Diving in 2003 and proceeded as a single independent firm," explains John Bolton, project and general manager of FSDS. "Since then we have expanded our services even further in the Caspian Sea to Turkmenistan, Russia, and Azerbaijan and the Black Sea, as well as the Middle East and now Far East Russia."

Currently operating in Kazakhstan, Turkmenistan, Azerbaijan and Russia, FSDS' vision is to become a leading provider of solutions within the subsea sector for the oil and gas industry. With well-defined values, the company operates in a safe, efficient and cost effective manner to deliver the best solutions to its customers. In addition, it guarantees the provision of high quality equipment and controls to promise safe and efficient operations, while also ensuring personnel work in an environment that is both challenging and rewarding. "We hire and train predominantly from the local areas we operate in, so for example in Kazakhstan and Russia we have approximately 40 IMCA accredited divers, seven IMCA accredited supervisors and seven IMCA accredited diving systems. The local personnel we use both as divers and in our management structure are a huge asset to us; we find them to be highly proactive and motivated, which helps us to achieve standards expected of us in these geographical areas," highlights John.

Proud to be an IMCA accredited company, FSDS benefits from taking on projects in areas with very few competitors boasting the same accreditations. On top of this, it has also accumulated a management team with international experience, a strength that attracts global entities in the oil and gas industry. "Other companies that are accredited don't have the same knowledge and experience that major oil firms prefer," says John. "Moreover, we have internationally recognised safety management systems and quality management systems in place, such as ISO 9001 and OHSAS 18001; these are managed efficiently to meet the satisfaction of global firms that require a higher degree of management and compliance than a local company may want. In Russia we comply with Russian Federal Legislative requirements

BIBBY OFFSHORE SINGAPORE

Formed in 2009, Bibby Offshore Singapore (BOS), part of Aberdeen based Bibby Offshore, extends the company's capabilities to provide enhanced subsea services to its clients in the Far East.
In addition to a growing presence in the region, BOS is also well positioned to support Eastern Hemisphere Operations of the company, and as such has been able to assist the operations of FSDS LLP and provide the assets and support to meet their requirements.

as a company and in the provision of subsea services, which are somewhat different from other areas."

As the oil and gas industry moves further north in colder climates, FSDS has the knowledge and experience to ensure the most demanding of projects results in success. "We can provide sub-zero temperature diving in areas such as Russia and Kazakhstan; we dive all winter round in these areas, in ice and temperatures as low as minus 20 degrees. This is an area we are keen to continue developing to ensure we are able to support oil and gas exploration in the Arctic," highlights John. "At the moment we are testing and developing equipment and our diving techniques to provide enhanced assurance of reliability for cold water diving. For example, the divers equipment we use on our personnel's body and equipment on deck can be used in temperatures as low as minus 20, even minus 30 degrees. We are building our own classed air diving system, which are specifically being developed for our future strategic plans to go where the oil and gas industry needs us in the sub-zero temperatures."

Well established in the Caspian Sea, the company was awarded a three-year contract to provide near shore and offshore diving services for Sakhalin Energy Investment Company, a consortium set up for developing the Sakhalin oil and gas development in Sakhalin Island, Russia, in August 2012. Known as Sakhalin II, the project includes development of the Piltun- Astokhskoye oil field and Lunksoye natural gas field offshore Sakhalin Island, as well as associated onshore infrastructure, and is managed by Sakhalin Energy. "We provide 365 days a year call out services for Sakhalin Energy's emergency intervention; we also provide planned inspection, repair and maintenance (IRM) services for the upkeep of their existing infrastructure and are developing techniques for emergency pipeline intervention for our client. Furthermore, we are providing IRM diving and ROV services for Exxon Neftegasin Sakhalin."

While continuing with operations in Sakhalin Island, the company anticipates a prosperous year with a number of tenders in Russia and Turkmenistan coming to a close. "We are optimistic for a busy year with expected contract wins in the Caspian Sea throughout 2014. Meanwhile, the core focus for FSDS is the enhancement of our cold water diving capabilities and the expansion of our classed systems, with our first classed system being built now and the second later in the year. These are specifically being developed to coincide with our plans to expand into the Arctic, however we also plan to move to a warmer climate as a way of diversifying our services over the coming years," concludes John. OEG

"We can provide sub-zero temperature diving in areas such as Russia and Kazakhstan; we dive all winter round in these areas, in ice and temperatures as low as minus twenty degrees

FSDS LLP
fsds-subsea.com

Services
IMCA accredited subsea service provider

Mammoth solutions

Above
The Guinness World Record project - the 13,191.98t PUQ deck

Below
The Dubai Drydocks 10,000t project

ALE's Middle East branch

operates as part of the wider ALE Group and has maintained an established presence within the Middle East for over two decades. The company was established as a full-scale operation in 1993 within the United Arab Emirates (UAE) and has since expanded to include permanent bases in Qatar, Kingdom of Saudi Arabia (KSA) and Iraq.

Through many years of experience and several record-breaking heavy-lift projects, ALE has grown into the region's leading full solution provider for heavy lift operations, including transportation, barge operation, crane supply, project management and bespoke heavy-lift gantry and jacking systems. The company maintains an impressive fleet of barges, heavy-lifting cranes and road transport vehicles that allow it to provide clients with turnkey transport solutions for cargos from origin to destination. These include heavy-lifting cranes with capacities ranging from 250 tonnes to 5000 tonnes, including the world's largest capacity land-based crane - the AL.SK350.

Its portfolio of heavy-lift equipment and transport vehicles allows ALE to service a host of blue-chip companies operating within the oil and gas, petrochemical and construction markets. However, its main business comes from freight forwarders who are charged with moving clients' cargos from origin to the desired location. Typically this involves receiving from vessels, transport by barge and finally heavy road transport to site. ALE manages solutions for all of these cargo options and as such can rightfully be considered an invaluable partner in the transport of sizable components.

Although the company is well established today, some of its key markets have proven to be challenging proving grounds where ALE has invested significant time, resources and expertise to demonstrate its position as a reliable partner and market leader, as Richard Peckover, ALE regional director – Middle East and Africa, elaborates: "Iraq is an extremely difficult area of operation. ALE spent over two years working out the most appropriate establishments to serve the markets, and today it is active in total project solutions, including crane hire, transportation, and barging operations. The growth in the Iraq oil and gas industry seems set to continue for a number of years and ALE is well positioned to support this growth with our continued development and investment locally in Iraq."

During January 2014 ALE completed the lift and installation of a topside module weighing 10,000 tonnes at DryDocks World in Dubai, named the DolWin. Commenting on the project, Richard says: "Teams from multiple ALE branches collaborated to design a unique gantry system for the lifting and mating of the topside structure at Drydocks World, which was the first semi-submersible platform constructed at the shipyard. The topside was lifted to a final height of 52.8m. Once at full height, the semi-submersible hull structure was maneuvered between the gantry system underneath the suspended topside. The topside was then lowered by ALE to the precisely positioned substructure, releasing weight in a controlled fashion. Welding and lowering operations of the two structures were carried out simultaneously."

As part of the ALE group of companies, ALE's Middle East branch is able to draw on the resources of the group as a whole, which gives every entity within the organisation an impressive reach and an extensive base of knowledge and equipment. "ALE's Middle East branch and the wider ALE Group collaborate on many major projects," Richard explains. "This includes the Dubai DryDocks lift where collaboration between ALE's branches in the Middle East and the Netherlands, as well as our research and development division, was key to the successful operations carried out. The core

HSQE and safe systems of work and training schemes are common across ALE and therefore this collaboration is seamless and effective. This means that ALE's clients receive the same quality of service whether in the Middle East, Europe or elsewhere."

Further to its work with Dubai DryDocks, ALE has further solidified its reputation for record-breaking solutions by achieving the Guinness World Record for 'The Heaviest Load Moved by SPMTs', which was awarded for the holding, transporting and delivery of a production, utilities and quarters (PUQ) deck during April 2014. The PUQ deck weighed in at a massive 13,191.98 tonnes and is the largest of its kind ever constructed by Lamprell. ALE utilised 512 axles of self-propelled modular transport (SPMT) to complete the transportation and load-out of the PUQ deck, which measured 98.5m long, 46m wide and 58.8m high. The deck was transported 883 miles, and took four hours to transport and ten hours for load-out to completion.

Commenting on the project Richard stated: "We are proud to have worked with Lamprell on this landmark project. The industry is continuing to see an increase in the size and weight of offshore structures and it is great that ALE's capabilities have enabled yet another record to be broken. Everyone involved worked tirelessly to ensure the success of the project and the teamwork between ourselves and Lamprell has culminated in the achievement of this award."

As the company transits through the remainder of 2014 and beyond it will continue to draw on the quality of its equipment and personnel to drive the business forward. ALE's active recruitment and training policy enables personnel from more than 25 nations to work within ALE's Middle East branch, developing their skills and progressing as the business advances. As ALE continues to distinguish itself through numerous high-profile lift operations the company will look to develop its business in Iraq while continuing to expand into the Caspian region, ensuring that ALE has a globally recognisable footprint for many years to come. OSG

> The industry is continuing to see an increase in the size and weight of offshore structures and it is great that ALE's capabilities have enabled yet another record to be broken

ALE's Middle East Branch
ale-heavylift.com

Services
Heavy lift
and transport solutions

Power house

The first regional wholly owned subsidiary of Cummins Inc., a global power leader and group comprised of four complementary businesses that design, manufacture, distribute and service engines and related technologies, Cummins Middle East FZE was established in early 2000 as a distributor for the region. Covering more than 12 countries in the Middle East has resulted in major growth opportunities for the subsidiary as infrastructure developments and a booming oil and gas industry continue to dominate the markets. Keen to take advantage of this, Cummins Inc. has invested billions in its R&D facilities and has strategically expanded its services in 2014, including in the Middle East.

Elaborating on the history of Cummins Inc. and its developments in the Middle East, Rachid Ouenniche, managing director of Cummins Middle East FZE begins: "Cummins Inc. has been in operation since 1919 and was the first company to successfully market large diesel engines in North America and today is the biggest independent large diesel engine manufacturer in the world. We are active in 190 countries, are publically listed on the New York stock exchange and had a global revenue of just above $17 billion in 2013. We are structured in four business segments, the largest being our engine business, followed by power generation segment, a components business unit and finally distribution. Historically Cummins Middle East FZE has been a distribution organisation, but since early 2014 we have expanded this part of Cummins Middle East by bringing to market the commercial leadership from each other business segment to ensure we can support our customers and distributors more efficiently."

This renewed commitment to the Middle East market follows a number of investments within the Cummins Inc. group, as it strives to continue meeting the demands of existing and potential customers in a number of industries. "Our main customers are power generation customers in the Middle East," says Rachid. "We also work with OEMs, particularly in the UAE and have a foothold in the marine industry as well as a growing presence in the oil and gas market."

As a supplier of engines for drilling operations within the stringent oil and gas industry as well as engines for other industrial applications such as mud pumps or dredging pumps, Cummins Middle East FZE benefits from being part of a major global business with direct access to its factory and expert personnel, as Rachid highlights: "The engineers who are developing these products gain constant feedback from the field that they can then act on to enhance a product and thus ensure we have leading technologies in the market. Research and development is one of the most important aspects to our business because we regularly sell products to our customers who are also our competitors, so for us to stay successful we have to offer the very best products. In order to survive as a business its not enough to be as good as others, we need to be better; this is why Cummins Inc. continues to invest."

Another recent service offering for the Middle East market is the High Horsepower Master Rebuild Centre; part of a global network of purpose-built facilities that provide high quality, high volume rebuilds of Cummins Inc.'s 19 litre and above engines. "The high horse power

engines all require rebuilds at some point in their life cycle, so we moved away from a work shop environment into a manufacturing environment that has a production line and enables us to provide a complete rebuild in one location," says Rachid. "We have one of the best rebuild centres within Cummins Inc., which is benchmarked by other distributors around the world as best in class. Volumes have increased significantly over the last year by three times and we are getting ever closer to full capacity as customers return to us, so in that regard this is probably one of our most successful initiatives for our business in the Middle East."

As the company continues to grow it has begun collaborations with three universities with the aim of hiring engineers through internships before converting these training schemes into full time work opportunities. "We have a focus on increasing the representation of women in the work force and have had a lot of success in the UAE, Saudi Arabia and Afghanistan. We are also working with universities to ensure they use the right curriculum so their programmes meet the needs of industries out there," says Rachid.

Having set the foundations for continued growth in a region rich with promise, the future looks bright for Cummins Middle East FZE as it looks to take advantage of upcoming projects, as Rachid concludes: "We have a presence in 14 countries here; this is one of the fastest growing markets in the world and when I look at different local government plans I see the upcoming World Cup in Qatar and the Expo in 2020 in Dubai. These significant infrastructure investments will require power generation products and also a huge amount of machinery with Cummins Inc.'s engines in them. We have aggressive plans in place, to not only grow, but to also gain market share from the competition with the products and people we have; we have a vision to be a preferred supplier for all of our customers and to be a key destination for employment and talent. With recent developments and our core values, we believe we are on the right track to achieving this." O&G

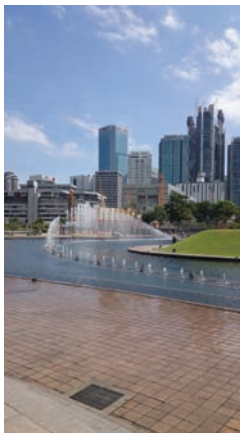
> The high horse power engines all require rebuilds at some point in their life cycle, so we moved away from a work shop environment into a manufacturing environment that has a production line and enables us to provide a complete rebuild in one location

Cummins Middle East FZE
cummins.com

Services
Power generation

Tropical oceans

Above
MV Fugro Equator, the third of Fugro's FSSV series of dedicated survey vessels. Designed to Fugro specifications and fitted with the latest survey equipment these are the most advanced vessels of their type. The vessel will be utilised on various projects in the Asia Pacific region



Fugro Geodetic Malaysia was established in 1984 to support the Malaysian oil and gas industry. Originally focusing on positioning and hydrographic survey services, the business has grown to include subsea services such as ROV, IMR and onshore/offshore geotechnical services. With its Kuala Lumpur office leading the strategic role as a geophysical reporting centre, it has regional offices in Jakarta and Thailand and a regional technical centre in Singapore.

Abdul Hanan, deputy general manager, introduces the survey services, which support the offshore oil industry: "The division has grown tremendously since it was established in 1984. From providing rig positioning and site survey services in shallow water, we are now also involved in deep water rig positioning, including subsea positioning services." As the leading provider of deepwater geophysical survey services in the region, it also provides ROV and subsea services and geotechnical services.

Fugro operates two geophysical survey vessels in the region, namely Fugro Equinox and Fugro Equator; the fleet also includes the Fugro Supporter for marine survey services and Rem Etive and Toisa Paladin for subsea services. Offshore geotechnical services are supported by MV Mariner and the new geotechnical drilling vessel, Fugro Voyager. The company also operates two Hugin 1000 AUVs in the region.

For onshore geotechnical services, Fugro utilises a fleet of crawler vehicles. "In Malaysia this market sector is highly competitive with many local vendors. As Fugro regularly works on major and critical projects together with local contractors, our reputation and expertise in managing such projects has been instrumental in our success in this sector," says Abdul.

In 2014, Fugro will mark 30 years of providing these specialist operations in Malaysia. "We are proud to have developed long working relationships with some of our major clients in Malaysia. At the beginning of 2014 we completed 22 years' service without LTI with one particular long-term client. Another significant milestone has been the award of a five-year IRM service contract from the same client," Abdul explains.

From Fugro's geophysical centre in Malaysia, its team of geophysicists processes data from the region and conducts geohazard studies using data from worldwide locations including Brazil, West Africa and Australia.

"Over the last 12 months the market has shown some new trends with an increase in demand for deepwater survey work. We currently have orders for up to five deepwater survey contracts in Malaysia to be completed during 2014 with more expected. Enquiries for

subsea maintenance projects have also increased in recent months," Abdul points out. At the beginning of 2014, Fugro Geodetic was awarded two major contracts in Malaysia.

In a three-year deal, which includes an extension option, one of the contracts covers the provision of rig and subsea positioning services. It strengthens a decade-long working relationship in support of deepwater drilling and development programmes offshore Malaysia. Support services include the use of highly specialised subsea survey systems for accurate metrology measurements, along with the provision of accurate offshore surface and subsea positioning and navigation systems for drilling units and vessels, working in water depths of up to 2000 metres.

The second is a long-term contract with an oil major for the provision of underwater inspection, maintenance and repair services on subsea infrastructure across Malaysia. The contract, which will run for five years, will see Fugro establish a project office in Miri and a support facility in Labuan. Commenting on the contract Abdul says: "We expect to engage most of our Asia Pacific subsea fleet over the duration of the contract, which includes saturation and air diving, deepwater installation of trees/subsea hardware and pipeline and platform inspection." In addition to the services provided from vessels, Fugro will also provide two permanently deployed ROV systems and operational personnel.

Having provided deepwater survey services since 2003, Fugro notes how the operations have developed. Abdul explains: "Initially we used a deeptow system, which required a long line turn and a second survey vessel for support. Now that we use AUV systems the time required to complete deepwater surveys is reduced by almost 70 per cent. Investment in the right technology has been vital to our success."

Despite reduced operational time, the interpretation of data from deepwater geology has its own challenges compared to shallow water geology analysis. To ensure its workforce is equipped for these challenges, Fugro provides training both in the classroom and online. "Our online training facility - Fugro Academy - can be accessed by our staff anywhere in the world via the Internet. We are also collaborating with a local university to provide internship placements for students. The programme has been running for several years and we are in the process of refining it to support the development of future employees. We also employ graduates straight from university, providing on-the-job training. We find that this method of training can be specifically focused on the individual's requirements and speeds up the process," says Abdul.

Whilst offering services locally, Fugro Geodetic also benefits from an international link with Fugro's worldwide experts. Should technical advice or guidance be required, a response is available within 24 hours. Its numerous capabilities help to provide a one-stop shop for offshore services with its people and their skills, dedication and professionalism being the main attraction for customers.

"We expect a busy year ahead, especially with deepwater exploration contracts. We have a good track record of accomplishment in subsea positioning for development activity and foresee a great deal of subsea work on platforms and pipelines, particularly as most of the existing infrastructure will require maintenance. As a business, we seek expansion in the next few years and will continue to develop new talent. Aside from the new technology that Fugro continues to bring to the industry, we view people and their contribution as our main asset, and their professionalism is key to our success," concludes Abdul. OGG

Whilst offering services locally, Fugro Geodetic also benefits from an international link with Fugro's worldwide experts. Should technical advice or guidance be required, a response is available within 24 hours

Fugro Geodetic Malaysia
fugro.sg

Services
Survey services to South East Asia's offshore industry

The pressure generation

Above
A mobile diesel engine drive screw compressor with large liquid pump, used for de-watering gas wells in Borneo, Indonesia. The client is Vico Indonesia, part of BP

Right
A wellhead gas compressor recently shipped to Croatia for INA. Vilter oil flooded screw type compressor with 250 kW drive motor plus a three cylinder piston pump send gas and condensate to a processing plant three miles away

Below
1 MW screw compressors for fuel gas boosting in Kuwait, feeding GE Frame 7 gas turbines

Gas Compressors Ltd (GCL)

was founded in the spring of 2000. From the earliest days, the ambition was to operate the business as a fully integrated facility. Recognising that success could only be built on a foundation of design expertise Rupert Easter, CEO, explains: "From the outset our focus was on the design; the build was subcontracted to outside steel fabrication companies. After ten years of operation we extended our capabilities, developing a large in-house manufacturing facility in 2010." It is a step opposite to the direction which many companies take as they seek to outsource. "I wanted the business to take control of quality and manufacturing scheduling, and from our large facility in the county of Kent, UK we are able to do this.

"We are a gas compressor packaging company, which essentially entails the design of gas compressors, skids and packages and construction that includes fabricating pipe, vessels, skids and structural steel. We have developed close relationships with a variety of manufacturers of equipment such as motors, compressors and heat exchangers, and our finished products and solutions attract customers from oil and gas, power generation and several other markets. Specialising in engineering and draught work we employ six AutoCAD Inventor draughtsmen, five electrical and mechanical engineers, various other office staff and 25 shop floor welders, fitters and electricians. We design and build each package, undertaking everything from basic to detailed design of vessels, calculations, manufacturing of vessels and piping and also design and build control panels, systems and electrics, with associated controls software. In fact, the only activity we currently outsource is the final painting of the units."

From its headquarters and facilities located in Tonbridge, UK, the company operates worldwide, with current production contracts set for delivery in Turkey, Thailand, Russia and Iraq, and recently completed projects in Croatia, Congo and Brazil. The customer base includes a good proportion of the world's oil and gas majors, large EPC contractors, refineries and power plants.

Rupert explains that over the past year, the gas compression market has been growing very strongly and continues to do so: "As our workload continues to increase, we are looking at solutions to grow in line with the market." Typical applications within the oil and gas

industry include flare gas recovery, fuel gas boosting for turbines, recycling in gas processing plants and refinery applications.

"One of the challenges we face more now is the process of how to build bigger skids and how to deliver them. The units are often too big for transport on road as a single item, so we are often required to design and build them in a way that they can be dismantled after factory acceptance tests and then reassembled on site. In that situation we follow the delivery to site and supervise the rebuild before carrying out further site acceptance tests." GCL has several ongoing projects in Russia, Asia and the Middle East, and a wealth of previously completed projects.

In December 2012, the business reached a major milestone, picking up its largest order to date. The project is for eight large skid units with air coolers and buildings to be used in flare gas recovery, one of GCL's biggest and very much growing markets. Each compressor system features a twin stage rotary vane

compressor, and the units are destined for incorporation into the total flare gas recovery upgrade that is underway at three major refineries within Turkey. "We have already delivered more than 40 full truck loads to the project," highlights head of sales, Tony Silk.

"All of our clients comment on the quality of our work, particularly our welding. We have always sought to employ the best welders in the industry. In our fabrication facility we currently work under an all TIG welding process, which although is time consuming, the quality of the finished product is fantastic."

GCL is an authorised packager for the following compressors: Gardner Denver, GE and Tuthill blowers, Ro-Flo rotary vane compressors, Howden, GEA Grasso and Vilter oil flooded screw compressors, GE and Knox Western reciprocating compressors. Other compressors available through GCL are oil free screw compressors, centrifugal compressors and diaphragm compressors.

Drivers can be electric motor, gas engine, diesel engine or steam turbine. Gas turbine drives are to be offered in the future. The business has recently employed a new operations director, Lee Clift, with a strong background from the oil and gas industry. The drive behind the appointment is the development of the production operation undertaken by the business. By enhancing the profitability and efficiency, Rupert looks positively towards the expansion of production and company size over the next three years: "We have got a lot of big projects in the final stages and we believe we are in a position to win several more large projects. We were recently successful in a tender for a project in Southern Iraq on a fuel gas project which is now in the early stages, and we are confident that future orders for flare gas recovery projects and shale gas will come in this year." OEG

New enquiries should be directed to Tony Silk, who can be reached through info@gascompressors.co.uk and directly at +44 7714 951251

Gas Compressors Ltd
gascompressors.co.uk

Services
Worldwide provision of sales, design, manufacture and commissioning of large and medium sized gas compressors, blowers, vapour recovery units, from small up to 20 MW size, and all pressures and compression technologies

Quality integration

This Norwegian based management service company was established in 1991 and has since grown to become one of the world's leading ship management service providers. Today OSM offers full management services to over 400 vessels, operates through 26 strategically placed office locations and employs over 10,000 people worldwide allowing the company to achieve true global coverage.

Commenting on OSM's growth strategy is the CEO, Geir Sekkesaeter, "At OSM we focus on providing quality, competence and transparency in each of our business segments. We believe this is what both secures the most long-term value for our customers and affords OSM the stable platform required for continuous improvement. The extra effort we put into our people, our organisation and our international network is what has enabled us to grow at such a steady rate."

"OSM Maritime Group was founded in 1989 in Arendal, Norway and established in 1991 following the company's first crew-management contract win," begins Bjorn Simonsen, managing director of OSM Crew Management. "Roughly 50 per cent of our manning operations take place in the offshore sector, particularly offshore support vessels and drilling units. The remainder of our Crew Management operations allocates 35 per cent towards tanker management and 15 per cent towards servicing bulk carriers, grain and cargo vessels. Crew Management services are managed from eight of our office locations, while the remaining offices are used as recruitment offices or as service providers."

OSM takes a proactive role in ensuring it consistently meets its mission target to deliver a comprehensive spectrum of impeccable, efficient and customer focused services in all areas of operation. "As a pure service provider, we do not own any vessels or steel, but we do have good people, both onshore and off, and successful systems that we have developed over the years. These characteristics make us flexible in managing a client's assets. Having worked in the North Sea environment for clients such as Statoil and ConocoPhillips for many years, our systems are well suited for our major customers, which is a huge advantage when it comes to winning contracts," says Elvind Nordal, the Kristiansand based managing director of OSM Offshore.

OSM in growing markets

OSM is strategically split into three divisions - Ship Management, Crew Management and Offshore Management – this strategy has enabled the group to aggressively expand over its 23 years of operation. One notable area that is representative of this growth can be seen in Germany. In commenting on this OSM's managing director of Ship Management Germany & Norway, Matthias Imrecke, says: "OSM Hamburg was established in 2009 with the aim of servicing the German and European markets with full technical and crew management services. As it stands today, our fleet includes two LR Panamax tankers, four Handymax tankers, three container vessels, 13 anchor handling vessels and platform supply vessels that we provide crewing for. We have noticed positive signs and trends in Germany and have grown by three units over the last five months in the container side of the business. Although this is a new segment for us in Hamburg we have anticipated this development for a long time and are prepared to handle the expansion. Traditionally, Germany has predominantly served as a tanker market, however, there are a lot of opportunities to develop this sector and expand in all directions where OSM is concerned."

In addition to Germany's developments, OSM is anticipating major growth for OSM Ship Management in Arednal, Norway for 2015. This forecasted growth comes as a direct result of the recent takeover of Neste Oil's shipping fleet, which has become an integrated part of OSM operating under the name OSM Ship Management Finland. Falling under the group's strategy to strengthen its position as a leading provider of tanker management services, OSM Finland will take on Neste Shipping's fleet of 11 vessels and approximately 300 seafarers. "We are working as a joint venture with Neste Oil, which involves retaining the seamen and office staff as well as the Document of Compliance for these vessel types. This strategy enables OSM to maintain approvals with oil majors, which is

important because without the necessary paper work it is impossible to operate. This approach means we can avoid any issues with paperwork while also facilitating a smooth transition into a new management structure," explains managing director of OSM Ship Management Singapore, Steffen Tunge.

To ensure the success of this venture, managing director of OSM Ship Management Arendal, Kjell Andreassen, comments on the anticipated support for OSM Finland: "Although OSM Finland will be directly responsible for this contract, we will support the office with our HSSQ systems and crewing management services. OSM has a very good reputation and health and safety record in the North Sea; and is well known for its stringent vetting of crew who operate the vessels we manage; these strengths will all be used to support OSM Finland."

Further growth for OSM can be seen in the Crew Management sector, where OSM has been taking advantage of its long-term expertise and strength within the group to develop its foothold in West Africa, as Bjorn Simonsen discusses: "We see huge potential in West Africa for the offshore sector; Nigeria in particular represents the largest economy and as a result OSM has been operating locally for five years in the Congo supplying crew and vessels to our own customers as well as to other clients setting up operations in the area. In line with the developments in West Africa, OSM opened offices in Laos and Angola in 2013 to provide local support to these areas and based on the resultant success, we are looking to expand into Mozambique and Tanzania."

OSM - drilling

Not a company to rest on its laurels, the group is also looking to develop its presence in both the Mexican Gulf and Houston following developing opportunities in the drilling market, as Matthias Imrecke elaborates: "In the past, the drilling industry has been dominated by major oil and gas players, but there are new companies coming into the market who we can provide management services to for their drilling units. We are actively exploring this marketing right now, using our onshore and offshore competence to find clients that may be interested in going into a partnership with us."

"There is a lot going on in Mexico at the moment as a result of a change in policies, so there will now be many more external operators moving into the region," adds Steffen Tunge. "We already have an office in Cuidad del Carmen, Mexico, where we operate supply vessels. Elsewhere, we see that the Far East is a growing market; it is a mature market but there is a wealth of new projects beginning that we hope to capitalise on."

OSM – training for the future

To meet the ever-increasing demands of the evolving industries in which it operates, the OSM group established the OSM academy in October 2010 to provide high quality training to seafarers. Following on from the Academy's success, OSM Crew Management established the OSM Training Academy in 2012; a game-changing state-of-the-art facility that provides both technically designed and soft courses that meet both STCW and client demands. "We have one big training centre in Manila, which is due to the Philippines being our biggest recruiting office; this is where our high end training is offered; courses cover a range of topics including deep sea simulation, engine simulation, crane operation, and drilling skills. In the future, we plan on expanding our offerings to include ROV pilot training and are looking to expand the centre to meet the developing needs of our customers," highlights Bjorn Simonsen.

OSM – EBN license

In addition to its training centre in Manila, OSM has opened training centres in other strategic locations around the world and is looking to develop another in Brazil where OSM Crew Management has recently achieved an EBN license. "We have focused a lot on establishing ourselves in Brazil and obtaining our EBN license means we now have a navigation license for working in the area. We can now manage every aspect of vessel operating for Petrobras on behalf of our customers, the vessel owners. This includes Petrobras reporting, vessel import and export, as well as technical, crew and operational management services. Meanwhile, Petrobas has a fantastic major plan for developments in Brazil in the future and these strategic steps are part of our aim to be a key participant in its programme," says Bjorn Simonsen.

Conclusion

With the foundations in place to continue growing in all strategic locations of interest around the globe, the future looks positive for the adaptable and versatile OSM as it utilises long-term experience to offer integrated, high quality services, delivered locally yet with a global reach. O&G

> At OSM we focus on providing quality, competence and transparency in each of our business segments. We believe this is what both secures the most long-term value for our customers and affords OSM the stable platform required for continuous improvement

OSM Maritime Group
osm.no

Services
Global ship, crew and offshore management

In safe hands

Ventspils nafta terminals (VNT) is the largest and the most technologically advanced crude oil and petroleum product transhipment company in the Baltic States. Having operated for more than five decades in the ice-free port of Ventspils the company receives and stores petroleum products from Russia and other CIS countries and loads them onto tankers for international destinations, thus ensuring safe, efficient and reliable operations on an international level.

The company achieved record throughput in 2012, but 2013 was more challenging, as managing director of VNT Lars Pantzlaff noted: "The fall can be explained with global processes – the US becoming a net exporter, the favourable trading conditions in the market of the Black Sea and other factors that are out of VNT control."

In response to these conditions, VNT invested in its terminal infrastructure and processes to continue building a solid foundation for the future performance of the company. The development strategy implemented to date has been successful and Lars believes that investments into development of the working environment and into employees are key to the success of any company. These efforts will continue to be in focus in 2014, together with paying attention to environmental protection activities. Setting up a vapour recovery system in the jetty area is defined as a priority, while one rail tank car loading rack are already equipped with petroleum product vapour recovery system for the possibility of loading crude oil into rail tank cars.

In fact, green initiatives are always at the top of the agenda for VNT – each year the business invests around 700,000 euros into green measures. It has developed an environmental management system, which analyses operations of the company and potential risks associated with it, and ensures regular environmental monitoring in its territories. In 2013 Sustainability Index experts positively evaluated this carefully developed environmental management system, and in May 2013 VNT was ranked in the Silver category in the Latvian Sustainability Index, receiving the highest evaluation for its responsible attitude to the environmental aspects.

"We are aware that we operate with petroleum products, which are dangerous to the environment; therefore environmental aspects are critical to us when thinking about the company's continuity and its responsible management," emphasised Lars.

The VNT environmental policy defines three major strategic directions – careful analysis of all potential risks to avoid crisis situations; purposeful reduction of the company's resource consumption, as well as investment in the environmental recovery, removing the consequences of pollution created in Soviet times. O&G

This dedication means VNT is one of the 'greenest' terminals in the world. "While other terminals are associated with steel and concrete, VNT is characterised by its green environment. The total area of the terminal is more than 100 hectares, a half of which is a green area," added Lars.

The responsible attitude of VNT to environmental resources has been reflected in reduced power consumption per one transhipped tonne in recent years. By introducing a document electronic management system, paper consumption was reduced by 22 per cent. Furthermore, the company carries out waste sorting for 12 different types of waste.

Moreover, for more than ten years VNT has invested around 700,000 euros in order to eliminate the consequences of pollution created in the Soviet Era. During this period the largest historical pollution in the company's territory was removed – around 3000 m3 of petroleum products, which was accumulating in the form of nonaqueous phase liquids occurring above ground waters, under the railway racks.

It is clear that VNT is very dedicated to environmental protection, but in fact this focus is just one part of a number of modernisation projects that the organisation has introduced. As Lars explained, the company has recently developed new operational software called 'Gemini'. "We had been using our old system (KRAVA) for the past 20 years. Due to operational changes and to further increased information exchange efficiency, we have now upgraded to Gemini. The main challenge of this was to improve the management of railway deliveries, which are historically a large part of our business. The new software is now in use and we will switch off the old one completely in the middle of the year," he said.

He added: "We are also looking at creating the ability to load road trucks. We have the facilities but they have been in hibernation for ten years, and over that time we never considered this as being a part of our business. However, activities are now underway to update the facilities and to market this service as part of our offering."

It is apparent that VNT is incredibly dedicated to improving its facilities and processes – indeed, over the past five years 22 million Euro have been invested in the development of the company.

Lars concluded: "We are blessed with a generous site layout and as we have improved the business over recent years we have also consolidated the use of our infrastructure. As a result, certain parts have become obsolete; such as an old pump station and railway unloading rack. These areas serve as a great basis to facilitate new developments, and one of the larger projects we are working on recognises that railway deliveries are a large part of our business. So we have cleared one of these old areas and are are planning to implement a new rail tank car unloading rack in that space." O&G

> We are aware that we operate with petroleum products, which are dangerous to the environment; therefore environmental aspects are critical to us when thinking about the company's continuity and its responsible management

BALTIJAS TRANZĪTA SERVISS

JSC "Baltijas Tranzīta Serviss" (BTS) is the largest private railway operating company in Latvia with its own fleet of main-line locomotives that allows cargo transportation of 15 million tons per year. Apart from transit shipments by rail BTS provides customs brokerage services for transit cargoes and railcar shunting services in the territory of the Riga Free Port terminals. Within the framework of mutually advantageous co-operation between BTS and Ventspils Nafta Termināls Ltd for the last seven years, the company has carried out railway transportation of all oil products received from oil processing companies in Russia and CIS countries.

BTS really appreciates its work with Ventspils Nafta Termināls Ltd, which is not only one of the technologically most advanced and dynamic companies in the Baltic States, but also one of the leaders in transhipment of oil products.

JSC "BALTIJAS TRANZĪTA SERVISS" is a member of the Latvian Transit Business Association (LTBA) and The Community of European Railway and Infrastructure Companies (CER).

Ventspils nafta terminals (VNT)
vnt.lv

Services
Oil and petroleum product transhipment

Professional service

Promar established its headquarters in Switzerland in 2002. Currently it has a fleet of multi-purpose supply vessels and fast crew boats under management, which serve the global offshore marine industry.

The company covers all aspects of ship management and has a presence in Africa, Europe and the Middle East, providing top quality services to meet the highest standards of oil majors and subcontractors.

Currently the business has a fleet of six multi-purpose supply vessels, 30 fast crew boats and provides bespoke vessel chartering services. It also has several dozens of vessels under construction. Given clients' requirements for modern and efficient vessels, a new series of fast crew boats is currently ongoing. These vessels are being tailor-made to satisfy the specific needs of the charterers, and state-of-the-art technology is being deployed for the construction process.

Being in a trend of fleet expansion, Promar is aiming to enlarge its fleet over the coming five years, and next year, a new Platform Supply Vessel will boost its fleet. The business proudly announced the building of a series of PSVs, and the first two units, named M/V Mamola Reliance and M/V Mamola Defender, will be delivered in 2015 with state-of-the-art equipment, in line with the North Sea standards.

Alongside the continued development of new vessels, the company maintains its leading position through its most important asset, its people. Promar believes that the growth of the company is interlinked with the zeal, enthusiasm and commitment of its collaborators, which is why it is currently investing in human resources with a strong recruitment policy.

Indeed, the company's success is largely down to the skill and deep-rooted knowledge of its employees, who have broad expertise in the management of offshore vessels. Its staff are fully dedicated and qualified in all the various competencies of ship management, and always adhere to the highest standards throughout their working practices, whether it be QHSE, chartering, operations or crewing, through to technical, purchasing, and insurance services.

As Promar gears up for further expansion, the business has moved its head office in Geneva to larger premises, tripling its office space, yet staying in the heart of the city of Geneva. The new office is significantly larger, to give the staff a greatly improved working environment, as well as room for continued expansion.

Last but not least, a process of constant listening and analysing client feedback allows the company to stay on top of offshore trends. Information sharing between on and offshore teams and continuous training is used to help deliver high-quality customer service.

Furthermore, because of the substantial risks of operating in harsh environments, Promar has specialist teams in Geneva and in its regional operating bases to handle quality, health, safety and environmental business issues.

Marine safety and safe working practices are always vitally important to the company. This approach has paid off, resulting in recognition and certification to ISO 9001, ISO 14001, and OHSAS standards, which completes ISM certification and affiliations with BIMCO and IMCA.

In fact, the highest possible standards in the offshore industry, combined with a rigorous best practice approach, forms an integral part of Promar's overall operational ethos. The company's QHSE management system sets out its key principles:

- To operate ships with the overriding priority of safeguarding crew, maintaining vessel and cargo integrity, and protecting the environment
- To promote a pervasive culture of safety, quality and environmental protection both onboard and onshore so as to control all risk and maintain constant preparedness for emergency situations
- To provide constant and continuous training for all personnel
- To monitor, ensure and promote QHSE policies
- To ensure respect and collaboration between offshore and onshore personnel
- Provide high quality operations that contribute to clients' reputation
- To set and maintain ethical standards in co-operation with customers.

For nearly 15 years Promar Shipping Services has been providing first class vessel services to clients in the offshore and oil and gas sectors. The business has an excellent reputation, strengthened by the dedication and skill of its on and offshore workers. While the business already has a strong and capable fleet, its recent investment into new vessels, due to arrive during 2015, is sure to make the Promar name a leader in the industry for many years to come. O&G

> In fact, the highest possible standards in the offshore industry, combined with a rigorous best practice approach, forms an integral part of Promar's overall operational ethos

Promar
promar-offshore.com

Services
Supply/offshore support vessels and fast crew boat services

Superior engineering

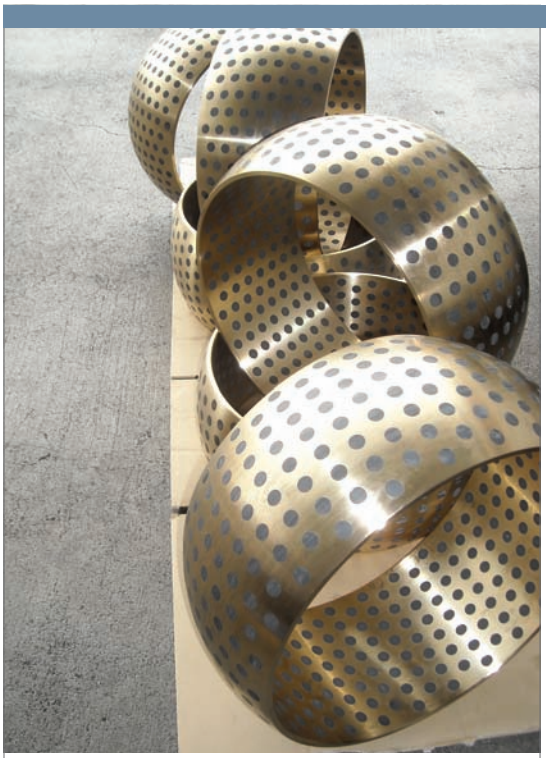
Founded in 2005 as part of LHG and GLT's strategic expansion into Asia, SBS-Singa Bearings Solutions® Pte Ltd (SBS) has developed an excellent reputation as an expert in sliding bearing technology in the South East Asian Region. Dealing exclusively with the distribution and manufacture of pre-finished sliding bearings, sliding bearing components and engineering plastics, SBS also offers superior design and engineering services for bushing applications to support customers with new concepts or machine upgrade requirements.

Focused on delivering high quality specialist services to customers in Singapore, the company caters to original equipment manufacturers (OEMs) and the aftermarket within the marine, offshore, dredging, hydro-power, mining, manufacturing and agriculture industries to name a few. Working alongside its partner company GLT-GleitLagerTechnik® GmbH & LHG-GleitlagerKomponenten® GmbH & Co.K, the company has a vast range of engineering resources and available stock to ensure fast and efficient global deliveries. "For SBS, customer service is caring for the customer from A-Z. We prefer to develop a personal relationship; hence why we always put emphasis on meetings to introduce ourselves. This commitment is not restricted to customers in Singapore as we regularly visit our business partners in Malaysia, Indonesia, New Zealand and Australia and also go to Europe," says Daniel Hallauer, managing director at SBS.

He continues: "At SBS we always check the requirements of our clients in terms of technical issues, materials, used sizes and so on to ensure 100 per cent satisfaction. As a company with a selection of more than 30 different materials, we also check if the requested material is really the most suitable for our client's application and if necessary will advise on other options that will improve performance." In addition to these services, the company also uses its in-depth knowledge to offer advice to engineers that design bushings too large, making recommendations that will result in cost efficiency.

Priding itself on the consistent provision of a high quality service, the DIN EN ISO 9001 certified firm has the skills and knowledge to meet the most challenging of demands through a flexible approach and fast response times. "Flexibility is a big advantage for our business partners as everyone is a high priority to us, regardless of whether they inquire for 1000 pieces or just one piece," states Daniel. "Most of our jobs are customised to meet the needs of our clients; with a stock of close to one million parts we can successfully provide solutions to special requirements for nearly all of our materials."

Out of the broad spectrum of materials available to clients, the three products most in demand from SBS are BRO-MAS®, LUB-MET® and COM-KU®/D. BRO-MAS® is the firm's series of solid turned bronze sliding bearings; offering nine different alloys to cater for diverse demands, SBS is thus able to customise performance and ensure optimum



quality through this DIN 1850/ISO 4379 range. Meanwhile, the (flexible) LUB-MET® bronze series is maintenance-free and uses graphite plugs to act as a solid lubricant; on top of this, the series can be combined with any of the bronze alloys within SBS' product range.

Discussing the COM-KU®/D range, Daniel highlights: "This material is a fibre reinforced composite and it has great advantages; for example, it is maintenance-free due to friction modifiers (PTFE & MoS2) within the resins. It has no swell when used in water, and extreme high load capacities that are similar to a high strength bronze. The material's flexibility allows edge loads and slight misalignments, protecting shaft and equipment from damages. Its insulating properties avoid corrosion, 'seizing' or cold welding of shafts in the bush."

In addition, the company has also witnessed notable demand for its self-lubricating, bronze sliding bearing GAP-MET® series, which is produced through a sintering technique that has graphite powder incorporated within its matrix. This maintenance free series also boasts high load capacities and high temperature resistance. "I would also like to highlight our FER-MAN® series, which comprises of special surface treated steel materials. The surface is plasma hardened in a vacuum to achieve a surface micro hardness of up to 900 VH! This is a problem solver for any application having short service life due to extreme abrasion wear; an example of this is in the dredging or mining industry, where we are able to improve bushing life by five to eight times," enthuses Daniel.

With a large warehouse in Germany, a huge amount of material stock in Singapore and a flexible manufacturing site that can hold production to focus on urgent deliveries, SBS has a strong reputation for meeting requirements, both on time and on budget. Lead time is viewed as an integral part of the company's service, particularly in the offshore and shipping industries where delays can quickly become costly, as Daniel highlights: "Our standard, even for big bushings, is around three weeks for clients in Singapore, but if needed we can reduce it to a couple of days for certain materials. Super-fast lead time is needed in the industries we operate in, as is fair, competitive pricing and close working relationships to fully solve problems."

To continue meeting the evolving demands of customers, SBS is soon to obtain an ERP software, which will offer the opportunity to have an interface with major clients and automatically receive alerts when these customers' stock counts are becoming low. "The ERP software will also give us improved traceability for our smaller and mid sized clients for drawing and part numbers," says Daniel.

Moving forward, the strong reputation SBS has acquired over the years is certain to hold it in good stead against challenges such as competitive costs, as Daniel explains: "We regularly get compared to Chinese prices, however these customers often come back after they have encountered a bad experience either in terms of product quality or false promises on lead times. Another challenge is that some clients only simply compare the prices without ever looking into the offered product's features. This opens up the opportunity for 'education'; if we are able to convince potential customers to try our products, they will see the quality and accompanied future savings for themselves and will then become a regular client."

Focused on increasing its customer base in Singapore and neighbouring countries that have relevant burgeoning and booming markets in the South East Asia region, the company has a strategic vision for its ongoing growth and success over the coming years. "SBS has just opened an office in Jakarta, Indonesia, due to the great potential in this country. Following its success, we plan to open branches in Malaysia and Thailand in order to have a stronger and better representation as well as a faster, more personalised service in these countries," concludes Daniel. OEG

> Flexibility is a big advantage for our business partners as everyone is a high priority to us, regardless of whether they inquire for 1000 pieces or just one piece

SBS Singa Bearings Solutions Pte Ltd
sbs-bearings.com.sg

Services
Sliding bearing technology specialist

Making connections

The focus of Visser and Smit Hanab has, since its establishment in 1870, been in pipeline and cable routing. Skilled in the associated drilling, it develops, builds and maintains technologically sophisticated and sustainable links, networks and systems for water, energy, chemical and petrochemical production.

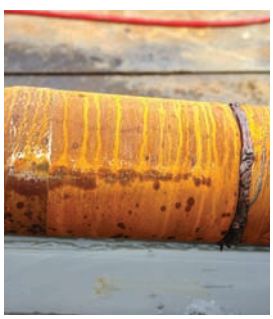
From the south of Holland, near to the port of Rotterdam its pipeline division is continuously operational in Europe, but its specialism, horizontal directional drilling (HDD) is called upon worldwide.

"Making connections is in our DNA," says company director Wilko Koop. "We believe in making connections not only between pipelines and cable networks, but also with our clients, seeking long-term collaborations in which we invest in a sustainable society," he adds. With a strong history in underground infrastructure with high voltage cables and high-pressure

pipelines the business has developed to become an attractive solution to clients within the oil and gas industry. "It is attributed to a combination of our specialist services that includes laying pipelines, the automatic welding system, which we developed ourselves producing good quality straight lines, and drilling techniques with micro-tunnelling and HDD activities.

"Clients are assured in undertaking a turnkey contract with our business that our specialist knowledge will support them through detailed engineering or produce solutions to questions and problems that are likely to arise during construction activities. We can help the client to make a constructible situation where the design would create limits based on the practices, the environment, the local population or other attributable circumstances," he explains.

Underground cables and pipelines, not indicated on maps or in the site history, are often



We work in close harmony with technical high schools and universities because we want to bring new, younger people into the business. We are financially strong with the capability to acquire new machinery, but financial strength is meaningless without the right people

discovered. Developing fine tuned solutions such as pre-bended drilling has helped to overcome such problems, which has in turn generated enthusiasm around the techniques. The market today is demanding longer lengths and larger diameters, something which, Wilko says, the business is quite efficient in dealing with: "HDD is broken down into several steps, pilot drilling, reaming and pipe pulling. We are able to drill exceptionally long lengths, but there is a limit. In this situation we undertake drilling from both ends, meeting in the middle."

In 2013 the company set a new European record, pulling 1700 metres of a high-pressure pipeline with a diameter of 48 inches. Making a total of 19 HDD drillings, the company's scope of works covered a 30 kilometre long section crossing rivers, canals, highways and railways. "The work was undertaken in a very soft soil area, high in peat, for which the best solution was HDD drilling. After a competitive dialogue our technical study was deemed to be the best and we were successful in the project," explains Wilko.

In the last ten years Visser and Smit has progressed into its role as a main contractor, specialising in automatic welding, horizontal directional drilling and micro tunneling, becoming well known in the market. "Everybody knows that if you have complex drilling you should ask VSHanab," Wilko points out. Staatsolie maatschappij, the state-owned oil company in Suriname, South America, was no exception. "We were asked to undertake a technical study for the construction of a pipeline connection over five kilometres. We concluded that the best solution was to use drilling methods as the overall length passed through the property of 50 landowners. We were awarded the project and we are now in the construction phase," he adds.

One of the strengths that attract customers to the services of the business is that it is willing and able to innovate. Employing 60 own pipeline, cabling and drilling engineers it is able to meet the borders of all the possibilities. With drilling specialists on the job site and the combination of engineers in the design department, the business has developed the ideal blend of specialists. "The innovation

EUPEC

For more than 40 years, EUPEC has been providing reliable solutions for the end-to-end protection of steel pipelines for both onshore and offshore pipeline industries.
EUPEC is one of the worldwide leading companies in the application of multi-layer anti-corrosion coating systems based on polyolefins.
This international reputation also applies to concrete weight coating, thermal insulation, on and offshore field joint coating, custom and on-site coating and reel-to-reel coating.
EUPEC is certified ISO 9001, 14001 and OHSAS 18001.

and development of new techniques is made possible by undertaking all aspects of the project in-house. Problems can be explained and solutions quickly developed. Today we have solutions that appeared impossible three years ago and we are always trying to develop in this way.

"We work in close harmony with technical high schools and universities because we want to bring new, younger people into the business. We are financially strong with the capability to acquire new machinery, but financial strength is meaningless without the right people. We have clients operating across the world so it is important that our workforce is flexible," says Wilko. In today's market, clients are programming less time into projects, resulting in limited time throughout all phases. With the strong team of skilled employees, the business seeks to address the design stages with a clear understanding of what is required, generating more time for the construction phase itself.

Historically, gas transportation contracts would last in the region of 15 years and infrastructure investment was more likely due to the security of return. However in the current liberal climate contracts are being agreed for much shorter periods, which increases the risk of investing in infrastructure. With this trend in mind, Wilko concludes: "Upgrades are inevitable, but the time and willingness in investing in new connections is limited, so we are keeping a close eye on the market, and whilst we are not convinced, we remain hopeful." O&G

> Skilled in the associated drilling, it develops, builds and maintains technologically sophisticated and sustainable links, networks and systems for water, energy, chemical and petrochemical production

Visser and Smit Hanab
vshanab.nl
hddsolution.com

Services
Develops and builds pipeline and cabling routes


BRIDON
Global Technology Leader
DYFORM
Bristar
Market leading ropes
for tough Oil & Gas
applications
Reaching higher
Going deeper
Lasting longer
Call us: +44 (0) 1302 565100
oilandgas@bridon.com
www.bridon.com

A growing trend

The full range of equipment offered by the company includes an extensive range of solutions for custody transfer/ fiscal metering packages, process automation and controls, interfacing solutions, system implementation and field services

A story from the Middle East

The Middle East has seen an unprecedented surge in oil and gas project activity in the past few years, and the next decade will be a golden age for the region.

Loops Automation LLC is a Middle Eastern company. Its management and partners have one ambition: the name of Loops Automation should always be linked with Middle East oil and gas business.

Since it was founded in 2000 Loops Automation has established itself as a leading supplier of specialised engineering packages, metering skids, and process controls. Early in the company's history it developed a strong reputation through several projects in collaboration with Iraqi oil and gas companies and refineries as part of the United Nations Oil for Food Programme. Shortly thereafter Loops Automation established itself as a reliable partner in the "Rebuilding Iraq" programme between 2005 and 2009.

Today Iraq is the world's third largest oil exporter and has the resources and plans to grow these exports to new highs. While Iraq remains a key market for the company Loops Automation has also expanded in other areas including the United Arab Emirates (UAE), Saudi Arabia, Oman, Sudan, Egypt and North Africa, as the company's business development manager, Nidal Sabbah elaborates: "Loops Automation started by delivering small-to-medium automation and control solutions and metering packages. Later in 2003 it began to produce custody transfer/ fiscal metering skids on a larger scale in terms of skid sizes and project values. These two areas now represent the core of the company's business with its main market centred in oil and gas, although it also provides solutions in areas like utilities, and other process industries.

"The company started small with only three employees. Now the business has around 68 staff and we are looking to hire more during 2014 as our workload increases. Since Loops Automation was last featured in *European Oil and Gas Magazine* we have focused on two areas. The first is to strengthen the foundation of the company by improving its business process, implementing ERP processes, and Knowledge Management (KM) concepts. The second area is targeting larger projects. We used to deal with projects reaching a value of around $10 million and now we are doubling this figure to as much as $20 million, especially in custody transfer/ fiscal metering. The potential is for this to grow, which will give us greater exposure to clients with larger projects."

At the time of writing Loops Automation has just finalised the production of large 32" gas fiscal metering skids with ultrasonic flow meter, analytical systems and associated control panels. It is also beginning a large project in Iraq to provide custody transfer metering packages for liquid and gas applications, which calls for ten fiscal metering skids for crude oil and 28 flare gas metering systems to be delivered within the next 15 months.

FLOW Management Devices LLC

5225 South 37th Street, Suite 4, Phoenix, Arizona 85040, USA
Tel: +1 (602) 233-9885 - Fax: +1 (602) 233-9887 - Email: sales@flowmd.com

Technological leader in Unidirectional Captive Displacement Provers

Prover Features Include:

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- Prover Interface Module with advanced Features

Optional:

- Prover Validation
- Cryogenic design for LNG applications

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- ***Functionality***
- ***Flexibility***
- ***Ease of installation***
- ***Ease of operation***
- ***Excellent customer service***

In pursuit of improving liquid and gas measurement technology

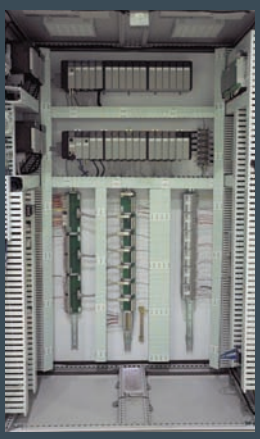
www.flowmd.com

The full range of equipment offered by the company includes an extensive range of solutions for custody transfer/fiscal metering packages, process automation and controls, interfacing solutions, system implementation and field services. Key to its product portfolio is its vast offering in liquid and gas metering solutions. The company has accumulated impressive reference projects in custody transfer, fiscal metering, and allocation metering of liquid and gas. As an independent supplier, the company employs the most suitable measuring technology for the application in hand, using ultrasonic, coriolis, turbine and PD meters. Its offering in this department also includes Bi-directional ball provers, compact provers, master metering, analytical systems, flow computers, and integration with DCS or supervisory systems. Loops Automation complements its portfolio with its integrated process control and safety systems (ICSS), industrial control and SCADA systems and field instrumentation. The company also provides a one-stop control solution for turbo machinery, and further to this all of its solutions can be supplied in standardised and tailored options.

"In oil and gas we know the technologies, the applications, and the trends that influence our offering to clients in the region," Nidal says. This allows it to routinely deliver the most suitable solutions in critical hardware and software for projects. These solutions can be delivered as single units or as full turnkey packages, which are integrated at every stage along the line and at every phase. This includes system and process engineering, design, selection, purchasing of products, hardware and software configuration, testing, installation, start-up, training of customer personnel, and after-sales service.

This is all complimented by Loops Automation's provision of integrated metering packages, DCS/PCS and ESD and F&G systems and all related interfaces at its own workshop. Work is verified during FAT (Factory Acceptance Test) witnessed by clients, eliminating the needs to hire separate vendors. The company has recently invested in new facilities, as Nidal elaborates: "In 2012 we moved into a new manufacturing workshop in Dubai. This facility is twice as large as the company's previous complex and incorporates around 25,000 sq ft of covered area and around the same size again in uncovered space, which we can use to build skids for example. The size and design of this facility allows us to carry out twice the size of work that we previously could."

From its Dubai base the company is able to serve clients throughout the Middle East, and as such Loops Automation is ambitiously working to establish itself as the premier supplier of turnkey engineered solutions to the oil and gas industry based in the region, despite certain challenges. "There is a general perception that certain engineering packages, like the ones we supply, are to be provided by international companies outside the Middle East due to their complexity. However, through the projects that we undertake, we slowly succeeded in changing the minds of some major oil and gas operators," Nidal says.



Another challenge is that due to the complex nature of the design work carried out by Loops Automation, its projects are not scalable. This means that the company cannot simply hire contractors to fill the gaps in personnel that can occur when taking on larger projects. This is something that the company continually addresses by working closely with local engineering graduates and through the use of its own comprehensive training programme. "We regularly hire fresh graduates and we give them further classroom training," Nidal says. "This is then followed by field training before they start working with teams, and then after two to three years they are ready to take on and lead projects of their own. As the business grows we will look to begin offering apprenticeship programmes because it will be necessary to grow our own work force for larger contracts.

"From a business point of view, we want to be the company that is always associated with oil and gas projects in the Middle East," he concludes. "This is the management's and the partners' vision for the company and we are ready to really go to great lengths to establish ourselves as a major name in the region. We believe that being a local business with local knowledge is an asset." O&G

FLOW MANAGEMENT DEVICES

Flow Management Devices LLC is a service-oriented engineering company located in the US that manufactures a line of Unidirectional Captive Displacement Provers and other measurement products such as Prover Data Acquisition or PDAQ. FlowMD Provers are the only Provers on the market utilising advanced technology such as Prover Validation. Prover Validation gives the users information such as self-diagnostics, time and distance between volume switches, Prover volume and flow rate through the Prover. This information allows the users to have confidence on the liquid measurement in the custody transfer environment.

Loops Automation
loopsautomation.com

Supply
Specialised engineering packages, metering skids, and process controls

Planting growth

ARCUS

Arcus is specialised in supplying stainless steel pipes, flanges and fittings. Knowhow and experience enables Arcus to add real value to customers in the oil and gas business.
Petrogas has selected Arcus for the Plastoil project based on quality, flexibility, service and high performance rates. The customer-focused dynamic approach is the heart of Arcus's philosophy and enables customers to manage their purchasing process as cost-effectively as possible.

BARTEC ENGINEERING + SERVICES AG

When we were asked to participate in the building of the Swiss site of a new production process, we jumped immediately on to the project path. It has been a challenging, but successful project realisation with Plastoil. Timing was essential, even not all of the equipment was in place on the target time. However, due to excellent project co-operation with our customer's project management team, we made it on time. The project was a great experience and we wish good luck to Plastoil for the operation.

Founded in 1993 under the name RVA Reststoff-verwertung, Plastoil AG was renamed in 2007 following a year of operations at its pilot plant in Sihlbrugg, Switzerland. Developed with a mission to treat plastic waste in an environmentally friendly and economically profitable manner, Plastoil's plant turns waste that would otherwise be dumped or burned into a high quality and sought after fuel.

Discussing the background of the company, commercial director Edwin Hoogwerf begins: "The Plastoil pilot plant in Switzerland has been running since 2006, transforming plastic waste into oil. In 2013 DiesOil (the concept owner and licenser) was looking for a company to take on the design of the system as well as the roll out of commercial plants. As a manufacturer of gas systems, metering units and regulating systems Dutch company Petrogas was able to provide the engineering as well as the realisation of these plants, which led to an exclusive co-operation between Diesoil and Petrogas in the second quarter of 2013. In the first quarter of 2014 Plastoil was taken over by Petrogas and became the exclusive party for the realisation of these commercial Plastoil plants."

A standard plant will have three production lines and an input of 15,000 tonnes of plastic a year, with a product output of 14.2 million litres of EN590 targeted guaranteed heating oil. "We are completing tests to prove we are wholly compliant with European norms for diesel fuels; these results will be back with us during June, so this is a very exciting time for us," enthuses Edwin. Once the company receives positive

results it aims to use the refined oil product in cars. “Our pilot plant has been producing high grade fuels for a number of years, which means we are in a great position to roll out commercial plants. Customers are lining up to become owners/investors/operators of these plants because the process is very profitable; our production process costs are approximately 30 European cents per litre, while the sale price of a litre of diesel is 70 European cents. So not only do we offer a process that is good for the environment, we also offer incentive through profitability,” he adds.

Elaborating on the development of the technology involved in the process, inventor Dr Weser highlights: “We began with mechanical biological waste treatment systems, which, instead of household incineration, sorts and prepares the mixed household waste into an organic fraction and a stream of recyclable materials like metals and inert material for road works. An ongoing problem in that stream was plastic, so we started to treat the plastic fraction with a special thermal depolymerisation technology (PTF). This basically means long chain polymers are cut by temperature to break down to molecules with diesel characteristic.” Despite being relatively simple the process has its challenges (PVC, heavy metals etc.), which is why the company keeps sorting, cleaning and preparation at the forefront of its thermal cracking system and thus ensures the oil produced at the pilot plant is high quality.

“What you throw into the system you find in the oil,” affirms Dr Weser. “So when we have sorted and cleaned the feedstock we melt the plastic with a temperature difference as small as possible between the heating medium (thermal oil) and the plastic itself. This is very important for the production of oil, because a high temperature difference between the heating medium and the plastic decomposes the polymers into coke and gas instead into liquid diesel.”

With the melting process complete the fuel goes into a crack reactor, where the cracked hydrocarbons are vaporised, but non-diesel specific polymer chains (C22 up to C30) are also evaporated. “With this in mind we invented a process that doesn’t let any gas pass that has more than 22 carbon atoms. We produce a liquid mixture of hydrocarbons between five and 22 carbon-atoms, while all longer chained go back into the crack reactor to be cracked until they are short enough to form diesel, and they then go into a distillation column,” Dr Weser adds. The vapours that have passed are condensed by cooling and then the light hydrocarbons (C5 – C8) are separated by distillation. The diesel-type fuel goes through a final treatment and online quality analysis before it is stored and offloaded.

Having generated interest from governments, investors and waste handling firms over the last 12 months, Plastoil is currently in discussions with potential clients in locations such as Western Europe, Southern Africa and Asia. These customers not only see the advantage of a highly profitable business through an environmentally friendly and efficient process, but also the creation of jobs with training and education for locals in developing areas. Additionally the plants provide energy, either through the sold fuel oils or an optional on-site cogeneration plant that is capable of providing heat and electricity.

In addition to constructing all Plastoil plants, ISO 9001, ISO 14001 and DVGW certified Petrogas will also build process modules at its factory in the Netherlands and offer operator training, full construction supervision, a performance test run of each plant as well as service and maintenance. With Plastoil looking to sell one plant per month and multiple plants contracted so far, the future looks positive for the company as it awaits EN 590 compliance and continues enhancing its technology to make products such as paraffin and kerosene. “With the interest we see from the market it is not unthinkable that supplying ten plants a year is not enough, so Petrogas will be looking to further production capacity in the near future. Ultimately, by providing a profitable process that is good for the environment and can improve communities in developing countries we can also ensure our own continuity so our personnel can work with the same level of satisfaction for many years,” concludes Edwin. O&G

Plastoil
plastoil.com

Services
Manufactures equipment to convert plastic waste into oil

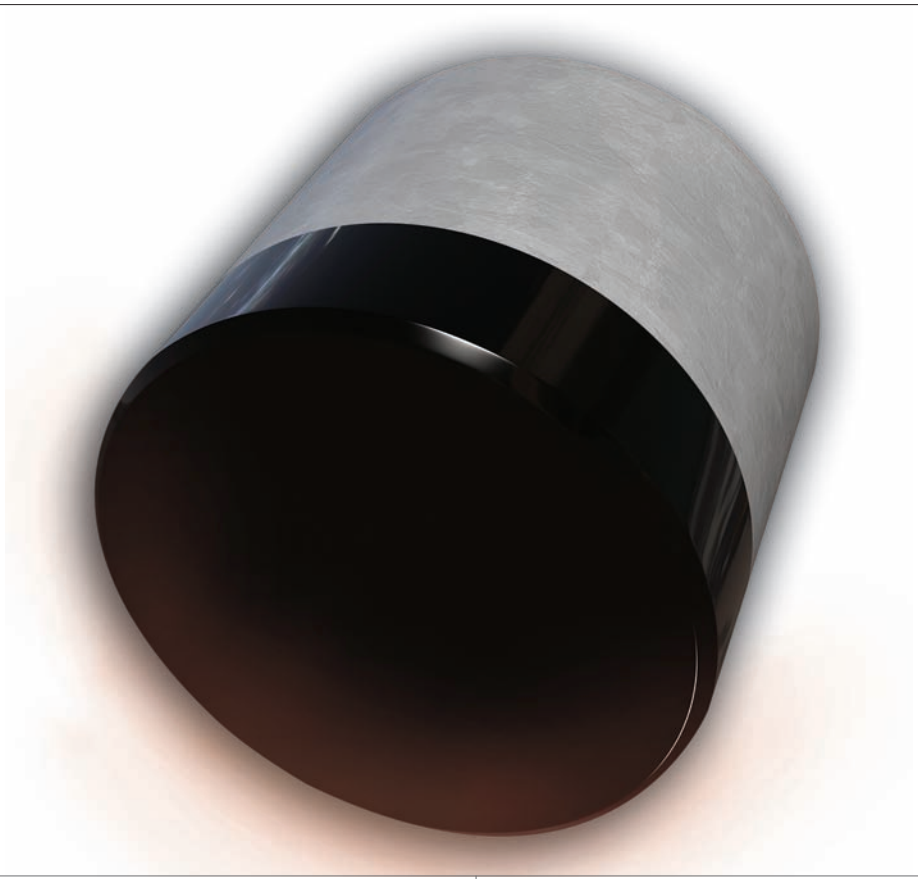
Global technology

NOV Downhole Eurasia Ltd operates as a division of its parent company National Oilwell Varco and is a market leader in the provision of both traditional and bespoke tools for complex drilling projects including directional drilling, fishing, well intervention, re-entry and well interventions. Through a global network of strategically placed divisions, tool supply and service centres NOV services clients including Saudi Aramco, Schlumberger and Shell Oil Company. Other regular customers include major oil and gas companies such as BP, ENI, Sino Gulf Energy, ExxonMobil, Weatherford, Statoil and Total.

National Oilwell Varco is a US public listed company listed in New York, founded in 1841 and its manufacturing, sales and services centres number more than 800 locations. These facilities allow NOV to reach its customers and deliver the highest quality customer-focused products and services that best meet the quality, productivity and environmental requirements of the energy industry. One such example of this is NOV Downhole's UK production facility, based in Gloucestershire, which produces specialised synthetic diamond drill bits. "NOV Downhole specialises in drilling bits and other drilling related tools, the objective predominantly is to reduce operators' drilling costs per barrel," says Gregor Ritchie, commercial director at NOV Downhole. "As a UK producer of synthetic diamond drill bits since the earliest prototypes in 1981, a significant proportion of NOV Downhole's revenue arises from this product line. In 2001 a breakthrough form of synthetic diamond component was developed at the Gloucestershire facility, and is now licensed worldwide to all major drill bit manufacturers. A significant royalty income continues to be earned by the UK company from this licensed diamond technology."

The benefit of high-density polycrystalline diamond material is that it allows for maximum thermal toughness and optimised open face volume achieved by reducing blade thickness while increasing blade height. All NOV tools are built to meet API (American Petroleum Institute) specifications, as well as the exacting requirements of the company's clients. NOV Downhole tools range in diameter from 3.5 inches to 26.5 inches, in steps of one eighth of an inch and to tolerances of 10/1000 inches.

Further to a comprehensive range of drill bits, NOV Downhole delivers a host of drilling technologies including its range of eTools and the Multiple Opening Circulation Sub (MOCS). The MOCS tool allows drilling fluid to bypass the BHA by porting directly to the annulus instead of flowing down through the drill bit. The ability to bypass the BHA is important in many cases, such as when pumping LCM (Lost Circulation Material) or acid pills, neither of which should go through the sensitive electronic equipment downhole. Most of the tools that are used to re-direct the direction of circulation are ball activated, which means that when the need arises to bypass the BHA, a ball is dropped that cycles the circulation tool. This can later be cycled again with another ball but the number of cycles is limited.



"The main benefit of the newest design of the MOCS tool is that it allows clients to cycle it as many times as they need. When something goes wrong in the drilling process this ability can become vital," explains Jan Erik Bree, product line manager for drilling tools. "Unstable wellbores where losses occur can require numerous treatments with LCM. The ability to spot as many LCM pills as required without having to trip out of the hole can make the difference in saving a wellbore and losing it. The response from our clients is very positive to the new MOCS tool, it is regarded as a welcome addition to the tools used downhole and the fact that clients can cycle as much as possible is a huge advantage when drilling more complicated, high risk wells."

The MOCS tool has a host of applications in challenging drilling conditions including lost circulation, work-over and completions, horizontal drilling, horizontal acidizing and stimulation, and others. Its benefits range from its ease of use, the elimination of multiple ball drops, reduced non-productive time through to dependable performance.

As well as tools that facilitate effective drilling in increasingly challenging environments, NOV develops tools that supply environmental and diagnostic information that can be used to improve the efficiency to current and subsequent wells. The eTools range is an Enhanced Measurement System (EMS) that utilises the company's IntelliServ technology to stream downhole information to surface at high speeds. "We have two versions of the EMS tool," elaborates Charles Harkey product line champion for eTools. "One of them is simply a memory tool for recording data while drilling. This data is used post-well to analyse the performance of that well and then improve on the performance of the next well to be drilled. This product is commercially available now and we have had great success with it.

"We have also been doing a lot of work with an EMS IntelliServ wired drill pipe and running jobs where we are able to stream data from downhole to surface at high speeds," he continues. "Then we take that data to the surface and feed it back into the drill systems to improve performance. We have had a lot of success with this tool too."

In addition to simply collecting data, NOV adds further value to its products by analysing the collected data and determining solutions for increased drilling efficiency. This saves the client time and resources and builds a comprehensive base of knowledge that can be employed by both NOV and its clients. Through its globally established network of facilities and vast base of knowledge, NOV is a global leader in downhole technology. Throughout the rest of 2014 and beyond the company will continue to focus on developing drilling technology to address increasingly complex drill operations and will work with clients to ensure that NOV delivers the tools of the future. O&G

> As well as tools that facilitate effective drilling in increasingly challenging environments, NOV develops tools that supply environmental and diagnostic information that can be used to improve the efficiency to current and subsequent wells

ALLIED MAXCUT ENGINEERING CO. LIMITED

Allied Maxcut (AMEC) is a supplier of high performance drilling, threading, reaming and boring tools to a wide range of industries including the oil and gas sector. Established over 20 years ago, AMEC has been providing the industry with tools for creating components such as distributed valves, process valves and flow control systems. Precision, performance and productivity are core features of AMEC tooling. Commitment to innovation in all aspects of product technology continually sets new industry standards in production, efficiency, tool life and manufacturing cost improvements. Whatever your needs, AMEC delivers high performance tooling at the cutting edge.

NOV Downhole Eurasia Ltd
nov.com

Services
Downhole tools and equipment

A valiant approach

Below
Darren Yeo, executive director and CEO of Vallianz Holdings Limited

Utilising its advantageous position in a major shipping hub, Singapore headquartered Vallianz Holdings Limited has established a geographical footprint across Asia Pacific, the Middle East, Latin America and is currently in the process of expanding its presence in the burgeoning market of West Africa. With a passion for excellence in all areas of operation, the SGX-Catalist listed company provides integrated offshore marine solutions to oil majors and national oil companies on a global scale; these services include vessel ownership, chartering, brokering, vessel management services and marine marketing services. Discussing the history of the company, executive director and CEO Darren Yeo begins: "Vallianz was previously an offshore marine services division within Swiber, an integrated offshore engineering, procurement, installation and commissioning (EPIC) services provider that has enjoyed huge success across Asia Pacific and Latin America, and achieved a revenue of over US$1 billion dollars in 2013. In August 2010, this division spun off to become Vallianz Holdings Limited."

He continues: "We have three revenue models, the most significant being vessel chartering and brokerage, followed by ship management services and finally investment holdings. Using our expertise in these services as a platform for growth we have spent the last two to three years aggressively growing the business within the OSV market. Through independent funding since 2010 we have also actively been reinforcing industry awareness of our strong management capabilities in this sector to secure our future prospects."

Keen to take advantage of a rapidly growing market, the company has invested in industry experts to operate and manage its increasing fleet of OSVs, which includes platform supply vessels, towing tugs and anchor handling tugs with supply capabilities. "We are very pleased an experienced industry professional, captain Lim Kean Hin, joined Vallianz's senior management team in 2013 as our vice president for QHSE.

KONGSBERG

200

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Kongsberg Maritime provides innovative and reliable solutions for safe and efficient operations at sea. Headquartered in Norway, we have 55 offices in 18 countries worldwide, providing systems, customer service and training for offshore, merchant marine and subsea markets.

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Profile

Z-Power Automation,an ISO 9001:2008;14001:2004 OHSAS 18001:2007;bizSAFE STAR certified company was setup in May 2008, specialising in design and manufacture of high quality Marine Switchboards, Remote Control Distribution Systems and other integrated Marine Automation Products.

Based on the background of the company Owners and employees, we have many years of experience and specialisation available. In total we have more than 40 years of experienced specialists to serve our customers needs & requirements.

Our Products

Our products are manufactured to International standards like IEC and marine class certifications eg. ABS, Lloyds, GL, BV, DNV, NK & RMRS or as per customer requirements. Our products are supplied to various countries for shipbuilding, ship repairs, conversions as well as retrofit works on board vessels.

- *Type Tested (IEC 61439-2) LV and MV Marine / Offshore Switchboards*
- *Type Tested (IEC 61439-2) Motor Control Centres*
- *Starter and Distribution Panels*
- *Customised Full Bridge Consoles, GDMSS consoles and work station.*
- *UPS and Transformers*
- *AMS, IAS and VMS system for all type of offshore vessels and Rigs.*
- *Design and engineering work.*
- *Propulsion drives and Motors*

Our Mission

To exceed customer satisfaction by providing the most innovative and effective one-stop-solution.

Our Vision

To be a world leader in the design manufacturing, Integration of complete marine and offshore systems

Agency and Services:

- *Niigata Power System (Japan): OEM Manufacturer for their Main Engines and Propulsion Remote Control System.*
- *Niigata Power System (Japan): Authorised Service agent for their Remote Control System*
- *Valcom SRL: Authorised Sales and Service agent for their measurement and control instrument products.*
- *Smart Automation AS: Sales and Service agent for their Integrated Alarm and Automation System.*
- *Lilaas AS: Service agent for their Control Levers and Joysticks.*
- *Windside (Finland): Authorised Sales agent for their Wind Turbine and related products.*
- *IMESA: Authorised Dealer and Service Agent for MV Switchgear Products.*

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Z - POWER AUTOMATION™
A Subsidiary Of BH GLOBAL MARINE LTD

Captain Lim has close to 40 years of experience and expertise in management, ship quality assurance, safety, environmental protection, crisis and emergency response," said Darren.

Adding to the strength of the company's management team is Mr. Ling Yong Wah, who was appointed as an executive director and senior vice president, corporate in March 2014. Mr. Ling brings with him over 25 years of experience in business, management and private equity, having previously worked with major companies listed on the Singapore Stock Exchange. The board of directors also includes non-executive and independent director Yeo Jeu Nam, who boasts 30 years of consultancy expertise, and Bote De Vries, a non-executive and independent director with more than 20 years of international asset finance experience. Apart from the strong management team, Vallianz will also be expanding its existing fleet to 50 by 2016, as part of its strategy to strengthen its market presence and capitalise on the business opportunities in the exploration and production market.

However, strengthening the management team and fleet expansion are not the only key strategies in place for the delivery of growth. Vallianz entered the Kingdom of Saudi Arabia through a 50 per cent acquisition of Rawabi Swiber Offshore Services Co Ltd for US$1.45 million in October 2013. Vallianz purchased the interest from Swiber Offshore Construction, a subsidiary of Swiber, which owns a 28.8 per cent share in Vallianz. Following this development, Vallianz entered Latin America through the newly incorporated Vallianz Marine Mexico SA DECV in February 2014. These moves have led to the company tendering for a range of contracts worth more than $1.2 billion in areas such as Asia, the Middle East, Latin America and Africa.

Although it is flourishing in a booming and competitive market, the company is facing challenges as it enjoys tremendous growth; one such example of this being the stringent demands of international and national oil and gas firms. "Our focus is on the OSV market in areas such as Latin America and the Middle East; we have four OSVs operating in Latin America and Mexico and 21 vessels under an open contract with an oil major in Saudi Arabia," says Darren. "We are expecting to increase our fleet to 50 vessels and that includes shallow water AHT, anchor handling tug supply, platform supply vessels, multi-purpose vessel, accommodation work barges and an accommodation pipelay vessel.

Presently we have two state-of-the-art vessels being added to our fleet over the next few months; we have started working on our own design and if demand is still growing over the next five to ten years our new vessels will ensure

we are ready for this. Looking at the kind of vessels we want, they have to be environmentally friendly, which is why we brought in new management with long-term experience to help us achieve higher levels of compliance."

With 28 offshore marine vessels currently in operation, the company aims to boost its fleet to 50 vessels by 2016, all of which will meet the necessary standards and regulations to operate in booming oil and gas locations around the world. These vessels will include PSVs, anchor handling tugs with supply capabilities, multi-purpose vessels and anchor handling tugs. Complementing these plans for fleet expansion, Vallianz has signed a collaborative agreement with a first class international shipbuilding organisation in China, for which Vallianz will provide market intelligence and engineering specifications for up to 200 newbuilds.

As part of the agreement, the company will have no financial obligations upfront and will have first refusal rights to vessels built in the shipyard; an advantageous position for the company as it looks to bid on projects and capitalise on upcoming market opportunities. "This collaboration will mean vessels are built according to our market intelligence and includes a strategic arrangement for us to acquire up to 200 newbuilds so we have vessels ready when we are awarded new projects. So far we have nine vessels under construction and have the opportunity to acquire more as we need them; although we aim to have a large number of vessels in operation around the world, we are going to be very selective and strategically look at certain markets to ensure our ongoing growth," concludes Darren. O&G

With 28 offshore marine vessels currently in operation, the company aims to boost its fleet to 50 vessels by 2016, all of which will meet the necessary standards and regulations to operate in booming oil and gas locations around the world

Vallianz Offshore Marine Pte Ltd
vallianzholdings.com

Services
Integrated offshore marine solutions

One-stop solutions

Above
Filling systems for any need

Below
The KCFILL1 is perfect for the safe filling of small amounts of LPG cylinders

With over 60 years of experience Kosan Crisplant AS has earned a reputation as a leading supplier of liquid petroleum gas (LPG) filling equipment and services. The company was founded as Crisplant in 1951 by Svend Christensen to develop transport systems for milk, before later transferring its knowledge base in to the emerging LPG market. Trading group manager Christian Fredberg elaborates: "When LPG was commercialised, Denmark was second only to the US in selling it on a commercial basis. Our founder learned that the knowledge that the company was already using could be applied in the LPG industry, so he took a chance and began building filling equipment for LPG producers, and that was the start of the business as it is today."

During the following decades the company began to evolve rapidly through organic growth and acquisitions, which allowed it to establish a strong base within the LPG market and incorporate new technologies and expertise. During the 1960s the Danish Kosan group acquired all of the shares in Crisplant and finally added the Kosan name to the company's identity in 1969. The company has continued to develop market-leading technologies while undergoing various management buyouts and takeovers. Today Kosan Crisplant is fully owned by the Seera investment bank.

LPG solutions for any need

The far-reaching experience of Kosan Crisplant and the high level of expertise it has retained over the years have allowed the company to develop a comprehensive portfolio of LPG solutions ranging from single filling machines with a 50 cylinder per hour capacity to complete filling plants capable of filling 12,000 cylinders per hour. Furthermore, Kosan Crisplant offers solutions for the refurbishment and re-use of cylinders, and its ability to deliver both bespoke and standardised equipment has enabled the company to establish itself in all of the world's LPG markets.

Worldwide presence

"We have just completed a count and Kosan Crisplant equipment is now used in 131 countries," Christian says. "We are strong in Asia, especially in India and Indonesia, and we are highly active throughout the Middle East. We have a good presence in all the countries around the Mediterranean and in North Africa and we are also very strong in South America. These regions represent the company's key markets. We consider the LPG market to be a small niche market where everybody knows each other and of course we want to be the supplier to all of the operators in the industry, including all of the large and small oil and gas companies."

Recent projects include the delivery of two high-speed filling plants to Gasco in Saudi Arabia and the opening of a similar plant for Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) in Bolivia. The new plant will secure the supply of LPG to the Bolivian capital La Paz and was inaugurated by President Evo Morales on 22 March 2014. The upgraded filling plant replaces a 30 year old LPG filling plant and includes a high-speed Flexspeed line for filling cylinders with screw valves. YPFB's Senkata filling plant in El Alto accounts for more than a third of Bolivia's LPG production and is a vital component in supplying LPG to the La Paz region. The upgraded facility will increase the production of the plant by as much as 50 per cent.

Safe and efficient small-scale filling

As well as supplying its traditional products to grateful customers throughout the world, Kosan Crisplant continues to develop new innovations to ensure that it is always on hand with market-

leading solutions to its customers' needs. During May 2013 the company introduced the highly successful KCFiLL1, a brand new machine developed for low capacity filling. The machine was first deployed in Panama, where nine machines were put to work at Panagas' filling plant in El Roble, and the KCFiLL1 has gone on to become a major seller in many of Kosan Crisplant's key markets. The KCFiLL1 was developed to allow for safe and efficient cylinder filling at smaller scales that can match the safety of larger operations. Christian elaborates: "For many years it has been understood that centralised filling is the most effective option for filling LPG cylinders and this is very efficient in Central America and Europe where there is significant infrastructure. However, in countries where these facilities do not exist it is necessary to de-centralise the filling. For this reason we developed the KCFiLL1 filling machine, which is very cost-effective when compared to other low capacity filling options. Our mission was also that everybody should be able to fill gas cylinders safely. Outside of Europe decanting is often used to fill cylinders, but this is very unsafe. With the KCFiLL1 filling machine we offer smaller filling companies a safe solution at a very low price."

A future beyond LPG

Throughout the rest of 2014 Kosan Crisplant will focus on delivering safe and dependable solutions to clients in all of its key markets and on further developing its newly established components trading division. Founded as KC ProSupply, the division supplies parts to customers operating throughout the entire gas industry, including LPG, cryogenic gases, ammonia and natural gases. As Christian concludes: "We recently acquired a company in Swansea, Wales called RMS as part of the company's strategy of growing its trading division and the purchase also gives us a stronger footprint in the UK. We have diversified to sell into new markets and this is in line with our strategy over the next few years where we will be looking to move into the natural gas market." O&G

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LPG filling services and equipment

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Liquid assets

Baltic Chemical Terminal (AS BCT) started providing liquid chemical fertiliser transhipment services in 2008 by putting into operation the high-tech terminal designed to handle over one million tonnes of ammonia and one million tonnes of urea-ammonia nitrate solution (UAN). The high quality of the services provides top-level safety and contributes to AS BCT's successful operations in the Port of Sillamae, Estonia, located 25 kilometres from the Russian Border. The geographical location, Free Zone Status and a possibility to release goods into free circulation in the EU member states allow AS BCT to offer its customers the best co-operation terms.

"The market for liquid fertilisers is relatively stable. We have seen a moderate increase by six per cent in terms of volume over the last 12 months, although we have not undertaken any major construction activities that are attributable to this. We added a different type of UAN tank a year ago and that was our last investment, but since then we have been addressing procedure and support surrounding this. We are currently in the process of upgrading control systems but also adding some additional measurement instruments that can actually be submerged in water, bringing the older tanks in line with more modern data technology. The tanker market is actually full of growing potential for the business," says Aleksandr Volohhonski, chairman of the board.

Within seven years of operations the company increased its tank storage capacity to 140,000 tonnes: two ammonia tanks of 30,000 tonnes capacity each and four UAN tanks of 20,000 tonnes capacity each. The service range was additionally extended by using specialised containers for UAN transhipment: IBC, container tanks, flexi-tanks and providing ammonia polyphosphate (APP) transhipment services.

"There has been substantial plans and developments within the port area and we have taken an active role in the preparation for these activities. We have been busy developing a measurement station that records what type of products are released into atmosphere. There is also activity surrounding the construction terminals around us. Although we have not undertaken any major projects we have focused on our own systems, working to ensure their functionality and making minor product adjustments as we look for continuous improvement," explains Aleksandr.

With access to nearby EU port facilities benefiting from deep-water and ice-free port with a natural berth depth of 13 metres, harbour waters protected from winds by a 1km long pier make navigation possible 365 days per year. The free custom zone and the possibility to release goods into free circulation in the EU member states are all benefits that the business and its customers enjoy. The quality and safety level of the services provided by AS BCT conform

VICOMA ENGINEERING

VICOMA Engineering is a complete independent engineering company with a history of more than 50 years. During this period it has built up a wide range of experience in the engineering of tanks and tank terminals.
The services of VICOMA Engineering are: feasibility studies, basic engineering, detail engineering, project management, procurement and construction management.
Within the company all required disciplines such as project management, process engineering, civil, piping, mechanical, electrical and instrumentation are available to execute your projects.
Due to this wide experience AS BCT has chosen VICOMA Engineering to execute engineering and procurement for its new terminal. The project was executed in Hoogvliet Rotterdam in the Netherlands.

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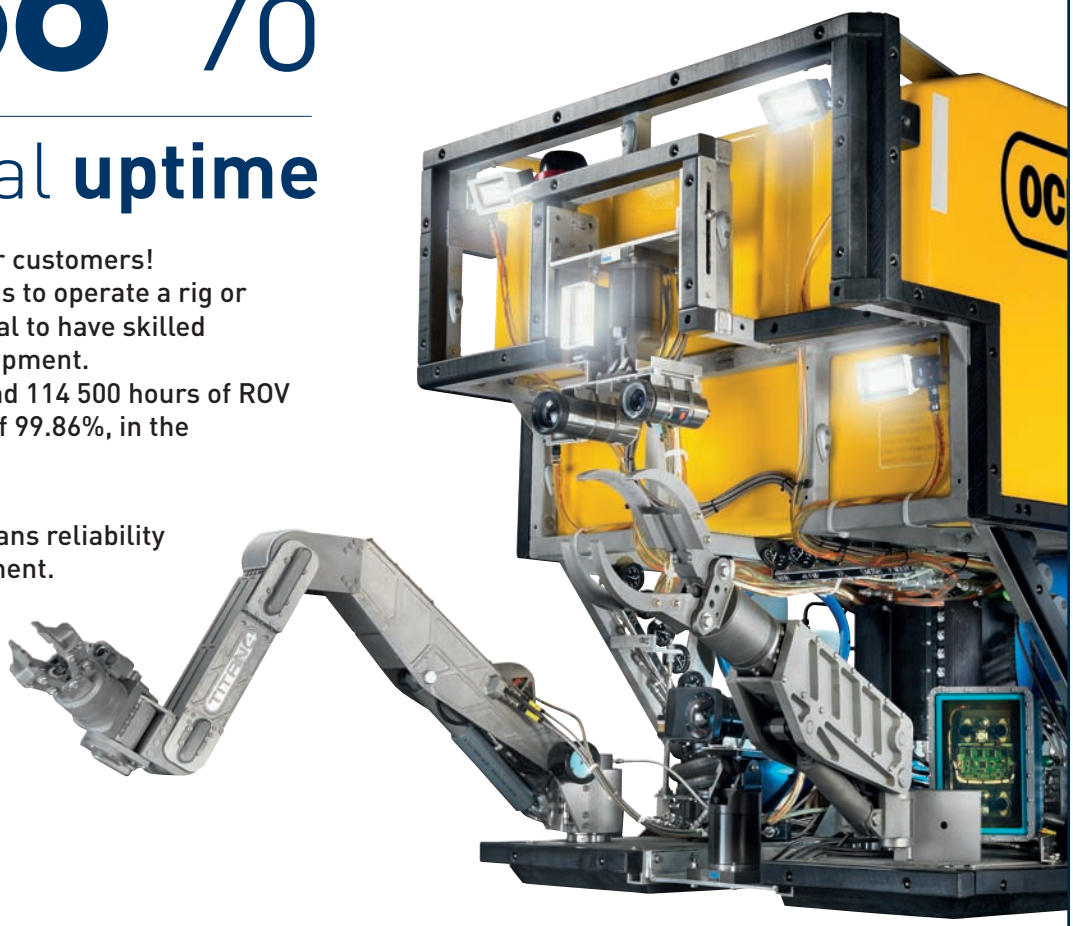

ROV

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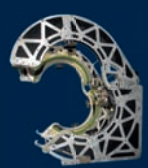
Oilfield Projects



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to the EU standards and requirements and the company has implemented an integrated management system confirmed through certification. ISPS certificates owned by the Port of Sillamae and compliance with the highest EU environmental requirements ensure sustainable growth of freight flow for the port.

The integrated system is successfully functioning at AS BCT. Its efficiency is confirmed by regular audits performed by Lloyds RQA and operations undertaken by the business are supervised by the international governing body as Aleksandr says: "We are not producing the recommendations ourselves, we are clear on the international supervisor's conditions, which is quite clear to our clients, and our staff are willing to respond to any problem and offer advice when required, above and beyond our main business interests. This approach to business helps bring the client to us, but also helps us ensure that the level of service within the industry is up to date.

"We have a policy within the company that allows us to make specific investments ourselves, and if customers wish for us to add an additional cargo that is not already on our list then this is something we are able to do." System improvement of the integrated management system efficiently results in compliance with the established and approved requirements, valid regulations and growth of the company's success. There are many advantages of liquid fertilisers over dry, particularly in the warmer regions such as Africa where there is a requirement to add water. It is this versatility that has placed the product in high demand.

"Demand from the industry has been very high and in terms of UAN we are looking at doubling our capacity. However, the industry does of course depend on famers replacing machinery from dry fertilisers or liquid fertilisers. We cover a region that stretches from Australia to Latin America and there is some question of how to transport it, as many terminals are not equipped for the intake of fertiliser cargo. One solution we are looking at is how to transfer into normal containers or tank containers, although this does work out to be more expensive," Aleksandr points out.

The company is one of the few that operates in liquid ammonia. The product is not particularly easy to construct and there are not many competitors. Commenting, Aleksandr says: "We are a modern terminal, built by modern technology and we have a lot of reserves for safety. We currently exceed all recommendations and regulations in place so we are prepared for any increase in tougher regulations. All our equipment is expandable, so for us, if there is a requirement to add a new product, it is easy for us to do without having to rebuild a terminal."

As the company looks towards the future, Aleksandr explains that one main aim of BCT is focusing on the continued improvement of control systems in terms of safety: "We have been doing this heavily over the last two to three years and we have a strong desire to continue in this way. Expanding our product list and the products, which we can handle is also set to play a major part in our focus for the future. However, this is not the easiest thing to do as a large specialist chemical terminal and we want to avoid entering the oil market. There is some development with add on fertilisers and hopefully there will be some investments on that side, particularly within ammonia, and some additional asset investment." OSG

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Baltic Chemical Terminal
bct.ee

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Liquid chemical fertiliser transhipment

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