ISSUE 109 • FINAL

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Arbitration hub

International arbitration in African oil and gas and Mauritius as a future hub

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THIS ISSUE: Dutch decommissioning

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> The need for adequate dispute resolution in this region, as a result, has never been greater"

The oil and gas industry is a complex arena for legal disputes, and as such international arbitration remains highly popular with energy companies.

Naturally, in areas of increased activity the possibility of disputes is greater, and with this in mind David Waldron of legal firm Morgan Lewis discusses international arbitration in the African energy market in this issue.

Of course, Africa has seen significant growth over recent years, growth that according to David "has led to investment by numerous non-local oil companies, and has been accompanied by an increasing number of exploration and production contracts. This will inevitably require refereeing, as more players enter the game. The need for adequate dispute resolution in this region, as a result, has never been greater."

Interestingly, as David highlights, Mauritius is potentially set to become a new hub for international arbitration. The country, which has a number of key advantages such as its location, its political stability, and its thriving economy, could play a vital role in the future of African oil and gas so turn to page four to find out more.

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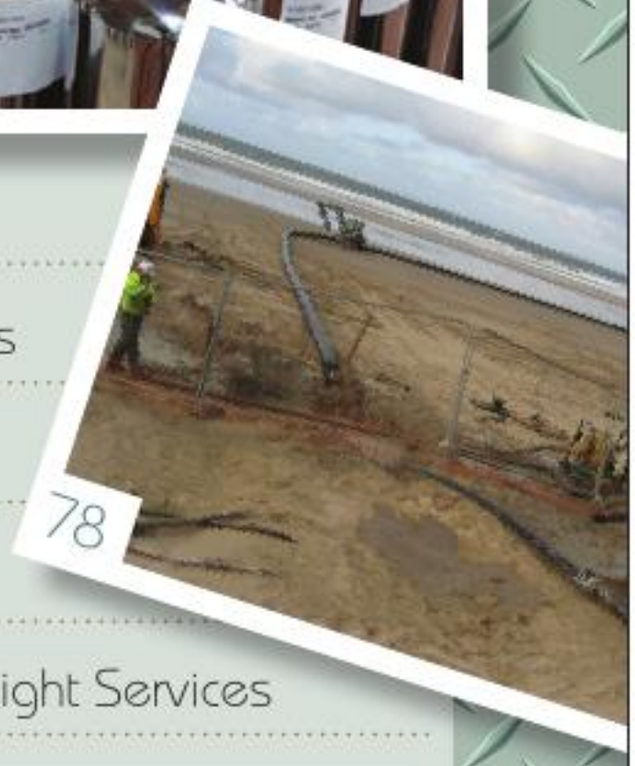


Arbitration hub

DAVID WALDRON DISCUSSES INTERNATIONAL ARBITRATION IN THE AFRICAN OIL AND GAS INDUSTRY AND MAURITIUS AS A FUTURE HUB

International arbitration has traditionally been popular in the hydrocarbons sector, and very much remains so, for a variety of reasons. The possibility of enforcement of awards in over 150 New York Convention States is a key consideration, particularly where assets are located in multiple jurisdictions. The parties' ability to nominate arbitrators to hear a dispute, and to avoid hearings being held in potentially partial local courts, also weighs heavily in favour of arbitration.

Confidentiality is also a major factor, due to the sensitive nature of natural resources contracts, and the greater finality offered by arbitral awards helps to avoid the sometimes glacial pace at which disputes are handled by national courts.

The case of Africa

Africa has seen significantly increased activity in the oil and gas sector in recent years. Most notably, Kenya, Tanzania, Mozambique and Uganda have made major recent discoveries of vast oil and gas deposits. For example, Tanzania now has an estimated 43.1 trillion cubic feet of recoverable natural gas. The commercial development of East Africa has led to investment by numerous non-local oil companies, and has been accompanied by an increasing number of exploration and production contracts. This will inevitably require refereeing, as more players enter the game. The need for adequate dispute resolution in this region, as a result, has never been greater.

Mauritius has taken up the challenge, and its government has repeatedly placed on record its commitment to establishing the country as an African centre for international arbitration. The leading international arbitration centres in London, Paris and Singapore have generally handled arbitration in the African region, with the exception of some West African OHADA arbitration; the latter is not generally highly regarded as a reliable arbitration forum. However, Mauritius appears well positioned to meet the clear demand for a regional arbitration hub. By way of comparison, South Africa, another major African jurisdiction, has a relatively underdeveloped arbitration law, and has recently revoked many of its bilateral investment treaties; its commitment to international arbitration remains very much open to question. Mauritius also benefits from its geographical position between Africa and India, and its status as an investment conduit into India.

Other advantages for Mauritius are its political stability, and its long tradition of democracy, good governance and

respect for the rule of law. It has a thriving economy, where services account for 70 per cent of GDP, providing a pool of skilled lawyers, accountants and experts in trade and finance. The country is also bilingual, with both English and French as official languages.

The Mauritian judiciary has traditionally been seen as both independent and supportive of arbitration. Mauritius is a member of the New York Convention, and has signed at least 38 bilateral investment treaties, of which 21 are now in force. Its status as a regional offshore financial centre means that assets are often held there, potentially simplifying the enforcement of arbitral awards.

A major step in establishing Mauritius as a centre for international arbitration was the passing of the Mauritian International Arbitration Act (the "Act"), which entered into force in 2008. It is based on the UNCITRAL model arbitration law, and thus is in conformity with international legal norms. Key features of the Act include:

- A provision giving default jurisdiction over appointments of arbitrators and administrative matters to the Permanent Court of Arbitration;
- A provision giving statutory force to the doctrine of kompetenz-kompetenz, under which an arbitral tribunal can decide on its own jurisdiction and on the validity of an agreement to arbitrate;
- Provisions expressly permitting foreign lawyers to act as O&G

both counsel and arbitrators in Mauritius;

- A mechanism by which court applications under the Act are heard directly by a three-judge panel at the Mauritian Supreme Court, with a right of appeal to the Privy Council;
- A provision for the award of interim measures, including security for costs.

Following the entry into force of the Act, a host country agreement was concluded with the Permanent Court of Arbitration in 2009, to be implemented by a permanent PCA representative in Port Louis. This was followed by the establishment by the London Court of International Arbitration, in conjunction with the government of Mauritius, of a new arbitration centre in Mauritius, to be known as the LCIA-MIAC Arbitration Centre.

The LCIA-MIAC: rules and costs

The LCIA-MIAC's rules and administrative procedures are based on those of the LCIA, although the rules are intended to incorporate aspects of both civil and common law systems, to reflect Mauritius' dual legal heritage. The LCIA court acts as both the appointing and supervisory body.

The LCIA-MIAC is a neutral and independent arbitral institution, providing administrative services only under its own, and under ad hoc, rules and procedures. These rules, in the absence of variation by the parties, are universally applicable for all types of arbitrable disputes, and are intended to offer a combination of the best features of the civil and common law systems.

These features include:

1. Maximum flexibility for parties and tribunals to agree on procedural matters.
2. Speed and efficiency in the appointment of arbitrators, including expedited procedures.
3. Provisions intended to reduce delays and counteract delaying tactics.
4. The power for tribunals to rule as regards their own jurisdiction.
5. A range of interim and conservatory measures.
6. Tribunals' power to order security for claims and for costs.
7. Special powers for joinder of third parties.
8. Waiver of right of appeal.
9. Costs computed without regard to the amount in dispute (discussed in further detail below).
10. Staged deposits, whereby parties are not required to pay for the whole arbitration in advance.

Parties to LCIA-MIAC arbitration may be domiciled in any jurisdiction and are free to agree the seat of the arbitration; in the absence of party choice, the default seat is Mauritius. Hearings may be held in Mauritius even if the

seat is elsewhere, or in any other location convenient to the parties and the Tribunal. Although this article deals with LCIA-MIAC arbitration in the hydrocarbons sector, there is no bar to submission to LCIA-MIAC arbitration of disputes in relation to any commercial contract.

Each party, as is typical in arbitration, has the right to nominate one arbitrator. The LCIA Court has the sole right to appoint the remaining arbitrator in the absence of agreement between the parties, though always having due regard for any method or criteria for selection contractually specified by the parties. The LCIA-MIAC states that it will attempt to ensure that each arbitrator is appropriately qualified as to experience, expertise, language and legal training. They will also ensure that the arbitrator is available to deal with the dispute as expeditiously as possible.

The LCIA Court may refuse to ratify a party-nominated arbitrator if it determines that the nominee is not independent or impartial or is not "suitable". There is a presumption in favour of a sole arbitrator unless the parties have agreed in writing otherwise, or unless the LCIA Court decides that the circumstances of the case require that it be heard by three arbitrators.

As regards costs, the LCIA-MIAC's charges, and the fees charged by the Tribunals it appoints, are not based on the sums claimed. A non-refundable registration fee is payable on filing the Request for Arbitration, and thereafter hourly rates are applied both by the LCIA-MIAC and by the arbitrators, with part of LCIA-MIAC's charges calculated by reference to the Tribunal's fees. The LCIA-MIAC sets a maximum hourly rate, at or below which the arbitrators it appoints must (other than in exceptional cases) set their fees. The LCIA Court will finally determine the costs of each arbitration, whilst ensuring that they are 'reasonable'.

The Tribunal's fees will be calculated by reference to work done by its members in connection with the arbitration and will be charged at rates appropriate to the particular circumstances of the case, including its complexity and the special qualifications of the arbitrators. The rates will be advised by the Registrar to the parties at the time of the appointment of the Tribunal, but may be reviewed annually depending on the duration of the arbitration.

The ICC (International Chamber of Commerce) has traditionally been the preferred forum for African oil and gas arbitration. However, it may often prove more expensive than the LCIA-MIAC Arbitration Centre, because it calculates administrative and arbitrator fees according to the amount at stake in the dispute, not at an hourly rate; this makes it cost-effective for highly complex low-value disputes, but the reverse (which is a more common scenario) is not the case. In practice, ICC arbitration also often moves more slowly than that of other arbitral bodies, due to additional stages in the arbitral process such as the need for the parties to agree terms of reference for the dispute. Its rules, however, give far more scope than those of other arbitral institutions for effective multi-party and multi- contract arbitration provisions. The ICC is based in Paris, which, although convenient where one or both parties is based in French-speaking Africa, may often give the LCIA-MIAC a further advantage in terms of logistics.

As Africa emerges as the potential centre of an oil and gas boom, it is increasingly important to have an arbitration hub that caters for the increase in disputes amongst natural resources investors. Mauritius' establishment of its own arbitral body in order to serve as such a hub is an ambitious attempt to do so. Its endorsement by the LCIA gives it every chance of achieving this; whether it has been successful in this venture will become apparent in the near future. O&G

Above: 3sun Group technician

Access all areas

Specialist provider of products and services to the global energy industry 3sun Group has been awarded full operator membership to International Rope Access Trade Association (IRATA). This accreditation certifies that the Group's personnel have the required procedures, skills and techniques to safely work at height.

IRATA members are obliged to work in accordance with the conditions laid out in the International Code of Practice commended by the Health and Safety Executive (UK).

Graham Hacon, CEO of 3sun Group said: "Securing full IRATA accreditation highlights the company's robust processes, practices and systems in place.

"Following a comprehensive review of the business, we have been accepted as a full member, demonstrating that our quality assurance, safety, training and working practices meet the required stringent standards.

"Working within the oil and gas and renewable energy industries, it is essential that we have the required accreditation in place and, as a world renowned industry body, IRATA was a top priority for us. Being IRATA approved will enable us to widen our service offering, including scaffolding, blade repairs and inspection. We will also now be able to deliver projects which require level 3 IRATA approved technicians who are capable of site supervision for work scopes requiring rope access."

Above: Skandi Skolten vessel

Rising stars

DOF Subsea has been awarded a contract for installation of the turret mooring and riser system for the Gina Krog FSO by Teekay Shipping Norway AS.

The scope of work includes installation of 12 suction anchors complete with chain/wires, STL buoy hook-up, and installation of riser system for the Gina Krog FSO. Onshore engineering will commence in the second half of 2014 with offshore marine operations to be executed in 2016. DOF Subsea's vessels Skandi Skolten and Normand Reach will be mobilised to carry out the offshore operations. Project execution will be handled by DOF Subsea's operation center in Bergen, Norway. Estimated contract value for the firm scope is approximately NOK 150 million, excluding options.

Jan-Kristian Haukeland, executive vice president of DOF Subsea, says: "This is the third significant contract we have signed with Teekay in the last two years for mooring installation scopes in the UK and Norway sector. We are delighted to have the opportunity to continue our relationship and co-operation with Teekay. Their ongoing trust in our capabilities demonstrates to us that our continuous investment in our people, especially within engineering and project execution, and our fleet of combined AHT and construction vessels, is yielding results."

Service on the high seas

Working on offshore facilities and ships is an energy consuming challenge for everyone involved. That's why offshore companies such as HGO InfraSea Solutions or RWE Dea AG and Hochtief rely on Good Food and More GmbH (GFAM) as an efficient and competent partner for their cleaning and catering services. Whatever a customer's requirements GFAM offers a comprehensive one-stop catering solution to meet all offshore crewing needs. GFAM adopts lean management principles to ensure a cost effective and robust solution for all parties concerned.

The process starts with the procurement of quality goods and ends with the professional preparation of superior quality food and service by highly trained staff as defined and controlled by the company's certified standards ISO and OHSAS respectively. The GFAM philosophy of 'Quality is the Key' is enhanced by its high degree of quality and transparency in the whole European Logistics chain to guarantee a seamless and dependable operation, whilst leaving enough room for individual customer wishes.

Above: Katy Gifford, chief financial officer at Aubin Group with Paddy Collins, managing director

Team building

Chemical technology specialist Aubin Group has appointed Katy Gifford as chief financial officer to strengthen its management team and help drive the future growth of the company.

Katy brings over 25 years senior management and international experience in the oil and gas industry to Aubin Group. A chartered accountant, her previous roles at director and senior management level include positions at S4 Advisory, a specialist business consultancy working with many leading oil and gas organisations, Wood Group, Talisman Energy and Stolt Offshore, a predecessor of Subsea 7. In addition, she is the non-executive chairman of Aberdeen Foyer, a charitable organisation supporting young unemployed or homeless people in the North East of Scotland.

She said: "Aubin Group has a talented and driven team who have developed an exciting portfolio of innovative technology which can be tailored to suit individual clients' requirements. This is increasingly vital as construction and production costs continue to rise in many provinces and Aubin Group's ability to contribute to driving down costs, as well as risk, is highly appealing to the international market."

Paddy Collins, managing director of Aubin Group, said: "We are delighted to have Katy on board at such a pivotal time for our growth. Her background in senior management and international expertise will play a significant role in helping the company to continue to develop and grow."

Keeping turbines turning

JOHN TAYLOR EXPLORES HOW THE OFFSHORE WIND INDUSTRY CAN TAKE ADVANTAGE OF TOUGH LESSONS FROM OIL AND GAS TO IMPROVE ITS PERFORMANCE, INTEGRITY AND SAFETY

Still considered to be very much in its infancy, the offshore wind industry is growing in stature as the green light is given to the creation of more offshore wind farms off the UK coastline and across the globe.

The UK has been the world leader in offshore wind since October 2008, with as much capacity already installed as the rest of the world combined, according to Renewable UK. The total offshore generating capacity in UK waters provides around eight terawatt-hours (TWh) of electricity annually, equivalent to the electricity consumption of around two million homes. In addition to the capacity already installed, a further 3.8GW is either in construction or has planning approval, and a further 7.8GW is in the planning system.

In order to achieve and maintain stable operations and to control cost an asset or wind farm must be properly managed, giving full consideration to all aspects including people, process, plant and equipment, regulatory requirements and not least safety and the environment. Failure to recognise the importance of any of these elements is not conducive to good asset management. Failure to put in place a robust management structure that sets and measures against minimum acceptable standards can cultivate unstable operations and lead to poor production and high operating costs.

Currently, the offshore wind industry has yet to adopt its own asset management structure, as the philosophy is to have equipment under warranty where the manufacturer has responsibility. However, warranty periods - generally around five years - are starting to run out, and a fresh approach to establishing a technical integrity assurance framework that enables robust asset management is necessary.

From one of Europe's first wind farms (the Shell/Nuon joint venture at Egmond aan Zee) to the world's first project-financed wind farm (Q7) which set the scene for pre-construction finance, right through to the latest floating wind technology – Statoil's Hywind pilot project – Xodus has been providing reliable, insightful advice and assistance to leading offshore wind developers throughout the entire project lifecycle.

Although the renewable energy industry is continually gaining operational experience, it only needs to look at its stalwart offshore oil and gas neighbour to know that forward planning and integrity management are essential to survival, as was so tragically highlighted 25 years ago.

Wind of change

The catastrophic consequences of the Piper Alpha disaster in 1988 was a dreadful reminder of the extremely dangerous work that is carried out offshore to ensure energy supply at home. The subsequent Lord Cullen Report into the tragedy set new standards, promoting a 'goal setting' approach that continues to be applied by Duty Holders in the oil and gas industry, where safety initiatives are driven forward and improved. Tough lessons learnt from this incident continue to dictate and reinforce the commitment to continuous improvement and many aspects can be seamlessly replicated in the offshore wind industry.

Clearly there are obvious differences between the two sectors, namely hydrocarbon containment is a crucial safety issue, oil leaks and spillage into the sea is a key

environmental factor; and the volume of people located and living at an offshore installation are the three main areas that differentiate the two industries.

However, there are many similarities where oil and gas experiences can provide lateral learning and the adoption of current practices around issues such as logistics, downtime, practicalities of transferring materials, equipment and personnel; and time-constraints with weather windows in implementing maintenance activities.

Asset management requirements

With a geometric growth in the number of offshore wind turbines installed in Europe over the last decade and demand increasing in other parts of the world, there is a growing need to transport personnel and equipment between the coastline and wind turbines during installation, commissioning and in the operation of wind farms. Therefore, maximising uptime is essential and achieving cost reductions through innovative technology, condition monitoring, portfolio management and optimum utilisation of manpower resources aligned to smart maintenance planning are critical to achieving stable operation at lower cost.

When developing an asset management structure it is always necessary to be mindful of the type of organisational structure that currently exists and the intent going forward. Trying to establish a framework that does not fit the company can do as much harm as was intended to do well, and is not conducive to maximising lifetime asset integrity.

Responsibility clearly lies in the first instance with the owner/operator to take the initiative to install a robust integrity management framework. Clearly demonstrated Key Performance Indicators (KPI's) should be established that set targets and these should be monitored and regularly reported against measuring performance as a minimum in terms of 'grid time', maintenance compliance against planned activities, and safety.

Setting Minimum Acceptable Standards (MAS) is undoubtedly an appropriate approach to foster continuous improvement. Without setting the MAS individuals will be left responsible for their own performance and the collective organisation will be accountable for the delivery of a highly productive, safe and efficient asset with nothing but their own initiative to drive them.

MAS set by the company should be such that the individual and the organisation as a whole have clear visibility and understanding of the levels of performance expected and which the company will always strive too, and be capable of delivering. To adopt a model that is considered complete once MAS is achieved may be all that a particular company can ever expect to accomplish. However, where there is opportunity for improvement and performance to be enhanced then it should never be considered complete.

Technical integrity and assurance

A philosophy of continuous improvement should always be encouraged throughout the company and 'goal setting' KPI's should be applied throughout the lifecycle of the asset to ensure that the performance of the plant and people is maximised; continuous improvement is a journey that has no final destination. O&G

If the asset management framework is robust and contains the correct balance between people, process plant and equipment, as well as the availability of competent resources, asset management can guarantee a structured approach that will enable the business to establish technical integrity and assurance.

Operational excellence

Providing the company sets realistic targets and advances at a pace that enables the organisation to manage the changes and feel the benefits, there is opportunity to move beyond performing to the MAS by adopting an approach that delivers operational excellence; an aspiration that provides great value is evident. It can lead to higher performance levels throughout the business and will reap benefits in reputation, employee satisfaction, and financial rewards through stable operations, and can lead to high production at lower costs.

Ultimately, in order to maximise the value proposition of offshore wind farms a robust asset integrity management framework must be put in place to ensure longevity of the industry and its progression into deeper water and more hostile environments – much like the evolution of the oil and gas industry.

Deepwater ambitions

Using only North Sea sites with water depths over 50m as an example, the potential for deep offshore wind energy is vast. 66 per cent of the North Sea has a water depth between 50m and 220m and could therefore be used to deploy the deep offshore designs.

At the end of 2012, there was just less than five GW of installed offshore wind energy capacity in Europe. A further 4460 MW were under construction and around 18,000 MW consented. The European Wind Energy Association forecasts that by 2020, 40 GW offshore wind capacity could be operational in European waters, producing 148 TWh, provided that the right framework conditions are in place. This is enough to power the equivalent of 39 million households; most of these developments will remain in the North Sea and Baltic Sea, while there is clear potential in the Atlantic and Mediterranean.

By 2030, EWEA forecasts 150 GW of installed offshore wind capacity, enough to power 145 million households. Offshore wind will represent 60 per cent of the new annual installations, exceeding the onshore market.

The UK Government is committed to a rapid increase in offshore wind deployment in order to maintain a secure energy supply, tackle climate change, meet its renewable

The expectation is that offshore wind will form a large part of the low-carbon electricity generating infrastructure in the next decade and therefore offshore wind farms are now being developed on a large scale as part of a programme called 'Round 3', which started at the end of 2009.

energy targets for 2020 and beyond, and provide green jobs for the country.

The expectation is that offshore wind will form a large part of the low-carbon electricity generating infrastructure in the next decade, and therefore offshore wind farms are now being developed on a large scale as part of a programme called 'Round 3', which started at the end of 2009. This will see offshore wind farms being constructed in deeper water, which will start to see even closer similarities to the offshore oil and gas industry where a common approach will be required to overcome many of the challenges.

Conclusion

Compared to other sources of renewable energy, the offshore wind industry is one of the more advanced sectors in terms of its technologies and its deployment at commercial scales, which are compatible with delivering the necessary capacity of low-carbon electricity.

With a rapidly growing market, the need to inspect, repair and maintain integrity of offshore wind farms will become more challenging and as time passes, these giant offshore turbines will age presenting similar concerns to today's oil and gas industry. The need to consider and implement all means of asset management across the offshore wind industry is therefore imperative at these early stages.

Lessons learned from other industries such as the offshore oil and gas industry, will provide many of the solutions to common challenges and will create an industry that is not only financially and economically viable, but also has a solid backbone to attain expected performance and safeguard against risk.

XODUS GROUP

John Taylor is principal integrity consultant at Xodus Group. He has worked in the oil and gas industry for 34 years, primarily offshore in the UK sector and in onshore oil terminals and gas plants. Involved with offshore hook-ups, major engineering/ refurbishment projects and production platforms, he spent 15 years in the Brent Field in inspection and asset integrity management. Employed as a principal consultant he has in recent times had the opportunity to transfer his oil and gas industry experience, becoming involved in renewable energy; providing knowledge sharing and promoting proactive thinking to support clients in the way in which they approach asset management.

For further information please visit:
xodusgroup.com

Going Dutch

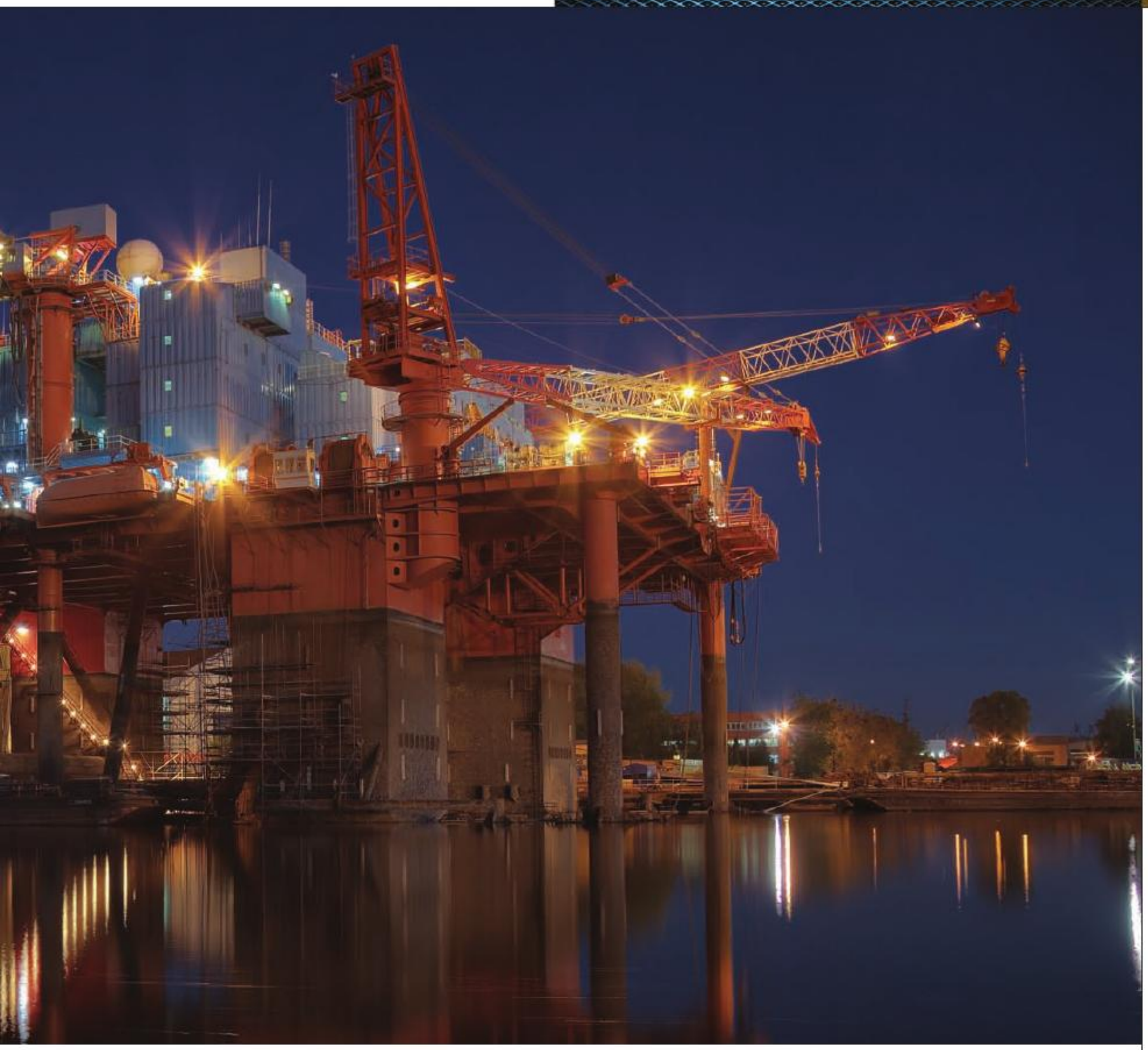
DICK LAGERWEIJ, DECOM NORTH SEA BOARD MEMBER, EXAMINES THE DUTCH DECOMMISSIONING MARKET AND WHAT CAN BE LEARNED FROM A COLLABORATIVE APPROACH

Across the globe, decommissioning in the oil and gas industry is now recognised as a critical stage in the life of an installation. Operators and contractors, large and small, are taking notice of the projected £35 billion spend over the next 25 years in North Sea waters alone. No longer is decommissioning perceived as a dirty job which oil executives are forced to consider as reserves run low. Decommissioning is emerging as a dynamic, innovative and collaborative opportunity in the oil and gas industry that requires forward planning and commitment.

Since the boom years of the 1970s and 80s, the general market trend has been to extend the economic and productive lives of mature offshore platforms through the development of marginal and remote satellite reservoirs, the introduction of new technologies and expertise with asset integrity and production optimisation. Despite this trend, it is now recognised that a growing number of oil and gas assets have either reached, or are approaching, the end of their economic life. In accordance with current regulations, assets will have to be decommissioned and removed. This presents challenges for the owners and operators, while offering major business opportunities for engineering consultants, contractors and service specialists.

As the dedicated North Sea industry forum, Decom North Sea (DNS) is charged with sharing experience in this sector by stimulating collaboration and co-operation to secure economic benefit. The not-for-profit organisation now has 230 members drawn from operators, major contractors, service specialists and technology developers from more than eight countries. The aim of the group is to bring people from all over the industry together in an open environment to discuss opportunities and, above all, to learn from one another.

To maximise the reach of its open approach to information sharing, DNS strives to unite members across borders and considers the North Sea as a unified area where individual company interests are left at the door to develop a forum of open dialogue and best practise to benefit all. As

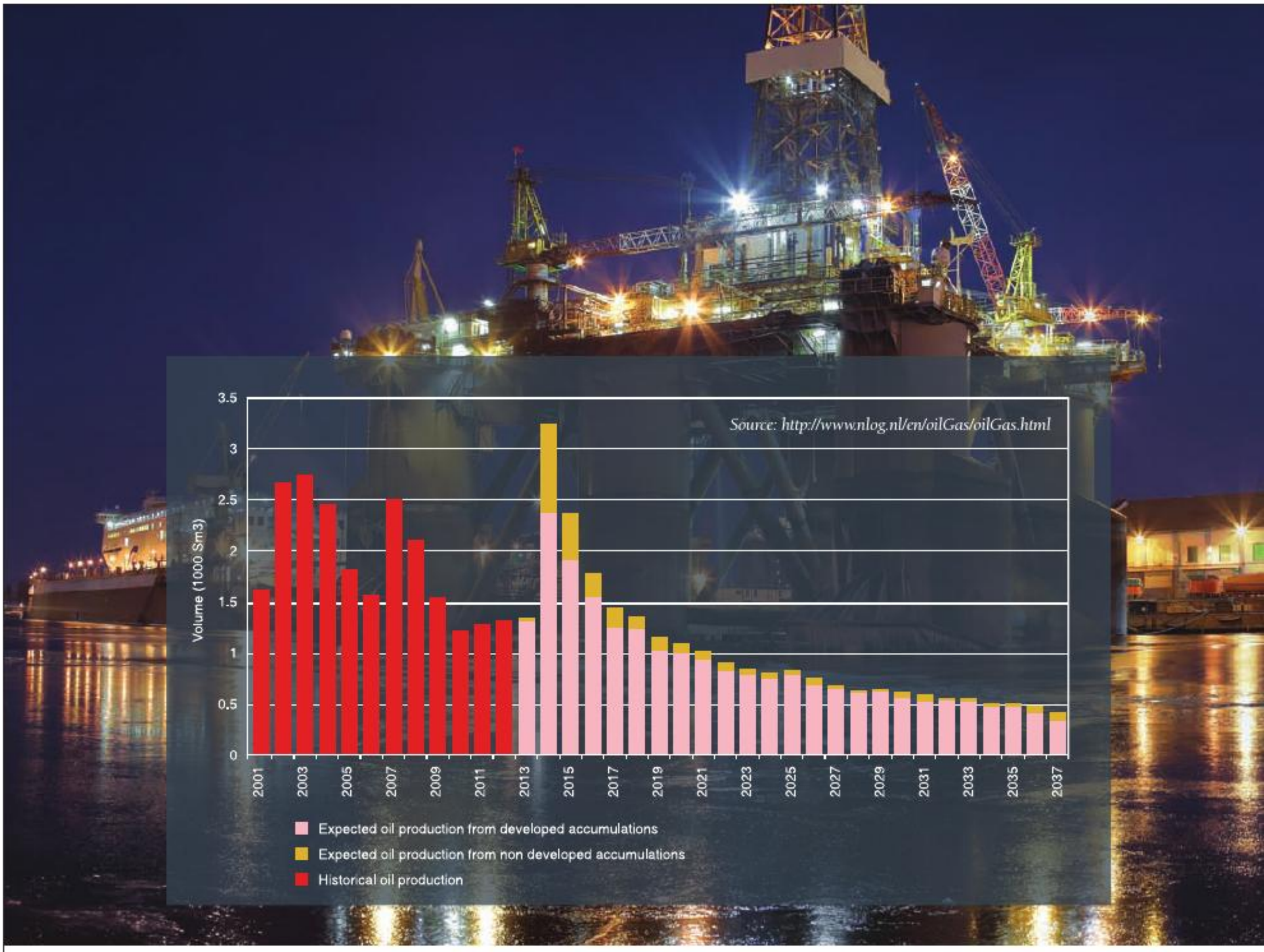


such, DNS is committed to strengthening relationships with its North Sea neighbours and currently supports 11 Dutch member companies.

The Netherlands is the second-largest producer and exporter of natural gas in Europe (second only to Norway) with 450 gas fields, 250 of which are developed. Oil reserves however are limited, despite the 44 discovered fields. Most of its natural gas fields are located offshore in the North Sea, although a number of them are located onshore, including Groningen, one of the ten largest natural gas fields in the world. Natural gas produced in the Netherlands is shipped via an extensive domestic and export pipeline system, which connects the country with the United Kingdom, Germany, and Belgium. In addition to pipeline natural gas, the Netherlands now serves as a transport hub for liquefied natural gas (LNG). The Gas Access to Europe (GATE) LNG terminal became operational in September 2011, with imported gas purchased by Austrian, Danish, and German distribution and utility companies.

The Netherlands is also among the largest importers and exporters of crude oil in the world. A number of large producers transport crude oil to Dutch ports, most notably Rotterdam, a considerable proportion of which is then re-exported either as crude or as refined product. Rotterdam harbour is the third-largest marine bunker harbour, after Singapore and Shanghai. Additionally, large oil storage facilities can be found at the Vlissingen and Amsterdam ports. In total, there is approximately 190 million barrels of storage capacity in the Netherlands, with the majority of it (about 80 million barrels) located in Rotterdam.

Despite its status, production in the next 25 years is expected to decline in Dutch waters. Oil production since 2001, and projected oil production for the next 25 years, is shown in the graph overleaf and is based on the annual reports of the operators. The decreasing trend has been reversed by the re-start of production from the Schoonebeek field, which will reach maximum production in 2014. After this time, production will show an overall decline towards 2037. O&G▶



As production declines, planning when an installation is decommissioned is an important consideration. Our Norwegian neighbours recommend that installations should not be left in place for too long after production has ceased as they rapidly deteriorate. The Norwegian Climate and Pollution Agency recommends a maximum limit of five years before starting decommissioning activities, minimising the inherent worker safety risks of aging structures and the potential for environmental damage. Commitment must be given to decommissioning operations with plans put in place early in the life of a field – maybe ten to 15 years ahead of closure. With 150 fixed offshore installations in Dutch waters, there is a lot to learn from the UK's decommissioning efforts.

I have worked with DNS for three years in addition to my role as commercial manager for Boskalis Offshore Marine Contracting (formerly SMIT Marine Projects). I have been involved in a number of decommissioning projects during that time and have witnessed how the market is changing. Oil companies are focusing on more cost efficient developments with smaller fields coming online, older fields being refurbished and innovations towards unmanned platforms being considered. Our government has laid out its plan to focus less on oil and gas and to develop more renewable forms of energy, and has already reduced allowable levels of gas production to protect against reservoir depletion and the associated environmental risks. This is a time of change for the industry; the future dictates a commitment to decommissioning our oil and gas legacy in a responsible way. Dutch companies have a lot to gain from an association with DNS. Not only can we learn lessons from our UK neighbours, we can foster strong business relationships with like-minded companies. DNS provides an excellent forum for networking to identify complementary services and innovations, to the benefit of its members and the overall development of the decommissioning industry.

When organising networking opportunities and events in other regions out with Scotland, Decom North Sea tries to partner with local trade associations to avoid duplication of effort and to bring the offshore decommissioning specialism to a wider range of companies. In the Netherlands, DNS has partnered with IRO since 2010. IRO represents companies engaged in all types of offshore and onshore engineering, and others from outside the industry seeking new business opportunities. Its membership has grown steadily, year-on-year, recently standing at 445.

As part of this relationship, earlier this year I was proud to host the first DNS board meeting outside of the UK. A number of DNS directors travelled over to Boskalis' office in Papendrecht for the meeting, where current DNS members

based in the Netherlands were invited to give an overview of their organisation before the board meeting commenced. The following day, we held a seminar in Rotterdam in partnership with IRO where over 90 delegates attended to hear from Marathon Oil on their perspective of the decommissioning sector; Aker Solutions on their recent contract win for the Murchison project; Wood Group PSN on their centre of excellence for decommissioning, and Allseas on an update of the Pieter Schelte build.

The focus of the seminar was to provide an update on decommissioning activity for current members based in the Netherlands and to attract new members in the region. With a planned learning journey to the Netherlands in October 2014, ongoing training courses and our annual Decom Offshore conference taking place in May, there are multiple opportunities for those with an interest in the industry to get involved.

The North Sea is a mature region, and in some respects, UK operators are pioneers of the decommissioning industry. I hope that the lessons we learn and the knowledge we gather can be of benefit to other regions as their assets mature. This year DNS looks forward to continuing its learning journey programme. These missions to countries including the Netherlands and Norway give members a unique opportunity to visit local companies which specialise in a variety of decommissioning activities. Seeing first-hand their facilities, understanding what that company does and how your company may complement their offering builds strong relationships.

Now is a time of growth and unprecedented opportunity in the decommissioning sector. It is a challenging industry with a great need for innovation and technology development – sharing of ideas, joint industry projects and open dialogue among operators, contractors and supply chain specialists across companies, and indeed countries, is a fundamental part of that journey. OSG

DICK LAGERWEIJ

With more than 15 years' experience in marine chartering and offshore contracting business, Dick Lagerweij is commercial manager for Boskalis Offshore Marine Contracting (formerly SMIT Marine Projects). His role focusses on decommissioning and facilities removal, ranging from engineering, design and procurement to offshore transportation and lifting. Mr Lagerweij joined the Board of Directors at Decom North Sea in 2011, where he aims to encourage UK/Dutch decommissioning relations.

For further information about DNS please visit: decomnorthsea.com

Building competence

SOFTWARE-BASED COMPETENCY ASSURANCE MANAGEMENT SYSTEMS ARE IMPERATIVE FOR SAFETY IN THE OIL AND GAS INDUSTRY

For a long time, competency has been an integrated part of workforce development for oil and gas companies. This is hardly surprising in an industry with high hazard exposure, where the cost of mistakes can be very high. In the past, inadequate competence management has not only contributed to disasters such as Esso Longford and BP Texas City, but has also caused fatalities, personal injuries and ill health. While many companies have competency programmes in place, there is increasing pressure on organisations to prove that their workforces are actually competent, particularly from regulators and other pressure groups.

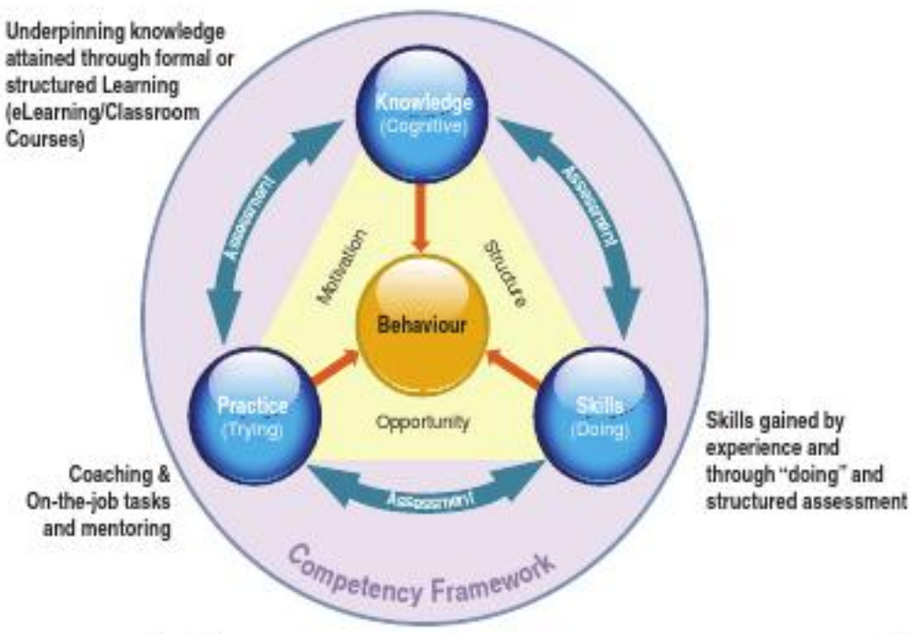
This increasing pressure means it is imperative for oil and gas companies to assess employee competency against standards, determine gaps and address them quickly. To manage this process businesses have adopted a Competency Assurance Management System (CAMS), which comes in many shapes, from paper-based, spreadsheet forms and procedures to software-based tools.

The key word is 'assurance'. Assessment should not be just a checkbox exercise, which only serves to say that someone has done a course or that a supervisor believes a worker is great at their job. It has to be structured, managed and standardised; software solutions can greatly help this process.

Employing CAMS not only helps reduce the risk of high cost incidents and ensure that organisations meet regulatory requirements, but also promotes business safety and workforce engagement, and enables standardisation of competency training across global organisations and industry as a whole. Sadly to date, successful application of CAMS has been hindered by apathy and by resource intensive systems, which use complex big bang approaches. Some software solutions can help make the transition more staged and manageable.

What is competency?

Competency is an individual's ability to show they have the practical skills and knowledge to carry out a task safely, at an appropriate pace, consistently and within their level of responsibility. Competence also means having the capacity to deal effectively with emergency situations. This kind of learning links training to a set of standardised competencies needed to perform a particular role or task that feeds into improved behaviours.



Beyond risk management, focusing on competence can also bring real and lasting benefits in terms of business and safety performance. Identifying and developing core competencies is key to workforce engagement, continuous improvement in business performance, and reduction in downtime.

Competency is particularly relevant to the UK, where North Sea Oil accounts for 0.7 per cent of GDP. A skilled and competent workforce is vital to the health of the UK Continental Shelf, in terms of ensuring safe operations, sustaining domestic oil and gas production, and supporting the export of knowledge and expertise. Single incidents, due to incompetent actions, can have a large impact on many offshore fields simultaneously, stopping production for weeks and possibly months.

What are the main advantages of software-based competency assurance management systems?

Despite acknowledging that competence is a major component needed to reduce environmental risks and to assure the safety of others, much training is still carried out on a very ad hoc basis. This explains why progressive oil and gas companies are turning towards software-based

competency assurance management systems to ensure their businesses are operating effectively and safely, with a full audit trail to prove this is the case.

In order to be successful and get company-wide buy-in, the software solution should be easy to use and should guide all users through the process, whatever their role is. It also needs to be standards-based so as to ensure consistency throughout companies.

Preventing accidents and mitigating risk

Engaging an effective software solution for CAMS can play a vital role in preventing accidents and mitigating risks, both improving safety and saving a great deal of money for the industry. For instance, when an oil rig shuts down, it can cost an organisation up to 20 million pounds a day. An effective, well implemented CAMS software solution can identify who should be deployed, and can also point out in advance where the gaps are in order to bring employees up to the required competency level, thus minimising the risk of these sorts of shutdowns. The automatic monitoring and reporting gives the company a verified audit trail for all eventualities.

Ensuring competency meets international standards across geographies

Software solutions should contain standards libraries, such as those defined, in the UK, by National Occupational Standards (NOS), and competence-based qualifications such as S/NVQ , IADC, OPITO, IMCA, etc. It is also essential that systems can incorporate existing in-house standards, or build new standards to meet specific competency criteria.

Standards-based systems ensure that employees have the practical and theoretical knowledge, skills and experience to perform a particular task, when assessed against company defined or awarding body standards. A comprehensive audit trail is particularly valuable in a global economy where companies need to move employees from asset to asset or internationally. Competencies recorded against formal standards means businesses can deploy employees quickly, knowing they have the right skills and up to date underpinning knowledge.

Improving engagement and motivation

An important difference between competency-based approach and traditional training is that competency concentrates on the employee's performance and skills, rather than the time they spend in developing the theoretical knowledge through e-Learning or classroom training.

Good software CAMS solutions have to be intuitive and event-driven to guide users through the competency process, in order to deliver a more engaging experience that motivates users to complete the process. Software competency assurance management systems can help to establish a trainee's existing knowledge and to reduce the training time through personalisation. By clearly showing real-time progress it increases the chances of the candidates completing the awards.

Good quality dashboards for managers and supervisors encourage higher activity at all levels and give them a concise snapshot of competency and progress at individual, local, country and global levels.

Reducing the administrative burden of regular assessment

Assessment needs to take place in a credible way and often at regular intervals to ensure that all employees are fully competent.This is particularly true for infrequent, complex or safety critical tasks. Competence monitoring and management should be proactive, not passive. This is helped by businesses that use software systems, which can automatically flag up when regular competence training is required. In turn, this will significantly improve staff and business performance, as well as reduce risks and the potential for human error. A software CAMS will help organisations to reduce the administrative burden by highlighting which workers need to be assessed or need to do what training, and when.

There is a clear consensus that for oil and gas organisations, qualifications are only part of the story. Experience gained on the job is at least as important to effective, safe working, as you cannot replace field experience. However, many companies are reliant on old systems which are ineffective and inefficient, hence the creeping apathy. The latest software-based competency assurance management systems can help ensure that both individuals and companies are deemed competent, which reduces the risk of unnecessary shutdowns or even loss of life.

Using intuitively designed software will also reduce implementation time and system training requirement, it will improve motivation and buy-in amongst the workforce and managers. The right CAMS solution is crucial for ensuring that the oil and gas industry has a developed competent workforce that can improve performance and operate safely on the international stage.

Adopting a software CAMS is the best way forward if organisations wish to not only meet regulatory standards, but also have a safe, competent and effective workforce, which fosters continuous business performance and growth.

Avoiding attack

CYBER ATTACKS TARGETING OIL AND PIPELINE SYSTEMS ARE GROWING AT AN ALARMING RATE, ACCORDING TO **PAUL TALBOT**, A LEADING IT INFRASTRUCTURE EXPERT WITH MANAGED IT SPECIALIST ADEPT4

Oil and gas companies are increasingly vigilant in the face of cybersecurity threats. As cyber terrorism and piracy threats loom large, ensuring the security of their operations, workforce and wider supply chain is essential.

IT security is now featuring on executives' radar, with business leaders listing infiltrations of their company's infrastructure among their top ten concerns, according to a recent survey by EY. Cybersecurity threats sit at number nine in that top ten list, and this is at a time when attacks specifically targeting oil and pipeline systems are growing dramatically.

In the US, 40 per cent of all cyber-attacks on critical infrastructure assets in 2012 were against the energy sector. In Britain, the government estimates that UK oil and gas companies lose £400 million each year as a result of cybercrime.

The UK Continental Shelf generates £20 billion in sales and employs 450,000 people both domestically and globally, according to last year's Economics Report from Oil and Gas UK. A workforce this size generates huge numbers of transactions, requiring a massive store of information.

Keep it safe

Sensitive details about people, products, intellectual property, health and safety and financial data are all stored electronically on computers, servers and clouds. Loss of such information would be highly damaging. An information security breach in an industry with a vast global remit could impact on reputations, operations and financial balances.

Yet a survey by global professional services company EY revealed IT issues were not of the highest priority within many companies. Only a fifth of businesses surveyed put implementing security standards as their top priority. Instead the number one business priority was business continuity and disaster response. This seems a reactive rather than a proactive approach.

The three areas of cybercrime most likely to affect the oil and gas industry are espionage, IP theft and share price manipulation, according to a recent government report. Many attacks could take place without the victim ever knowing. Yet so much is at stake if this kind of information gets into the wrong hands.

Bespoke solutions

Understanding organisational behaviour and use of technology is key to mitigating risk in industry. Simply backing up data is no longer enough in a climate where cyberterrorism and piracy is growing. It is essential for companies to ensure their IT systems are as safe and secure as possible and that they take a proactive approach to protecting their own and their customers' financial and commercial data. It is also vital that a company's IT strategy is adequately represented at boardroom level to reflect the potential financial and reputational damage that could result from any security violation.

But IT can suffer from an image crisis – a topic management often put low on the business agenda. Yet improved systems and IT infrastructure add value to a company. In the right sector, a company's value could rise

> Only a fifth of businesses surveyed put implementing security standards as their top priority. Instead the number one business priority was business continuity and disaster response. This seems a reactive rather than a proactive approach

by millions. An up to date IT system brings geographically spread teams closer together and speeds up functions, more importantly it creates a safer work place.

Oil and gas is a high stakes industry where operational safety is critical, but too often IT is taken for granted like electricity or water. It seems to be only when it stops working that people take notice. There is little room for error when drilling a deep sea well, negotiating complex underwater structure or piping hydrocarbons to shore. IT must be secure and employees must know the associated rules and regulations and feel confident about their systems.

But some firms are choosing to expand their operations when they have out of date, ill-fitting systems. This can cause data to be inaccurate or even lost, and incorrect information will have a direct impact on a company's sale price. A one-size fits all approach isn't appropriate where IT is concerned – every business has unique needs and this should be reflected in their systems.

Critical expertise

adept4 helps organisations align their IT strategy with the overall aims of the business, focusing on delivering IT and communication infrastructures that not only perform but position the business for future growth. The team offers a range of managed IT, software development and consultancy services including messaging and collaboration, server management, SharePoint development, ERP systems migration and infrastructure refresh. adept4 solutions are delivered on-site or in the cloud and are supported by an ITIL, SC cleared, 24x7 UK based help desk.

The company is ITIL accredited and has official partner status with some of the world's leading technology vendors. Consultants, technicians and service delivery teams are equipped with the latest skills and have expert understanding of each component and its interoperability in creating a secure, resilient environment.

adept4 designs and develops bespoke SharePoint based document management systems to improved collaboration. These systems also support the health and safety process across the business automating the indecent log and reporting system.

Avoiding and managing unnecessary risk is a key strategy for successful operations. This means security, compliance and regulation have become the holy trinity for energy companies as they strive to avoid risks which are now an everyday reality.

No room for error

The energy industry has a low error threshold, so the demand for secure infrastructures is even more vital. Keeping a business in peak condition means an invincible communications network is critical, supported with back up capabilities and anti-virus management.

But security is complicated in an industry with high dependency on supply chains. There is no point in an operator installing IT security systems if the companies in their supply chain do not. Risks can only be effectively avoided if every component in the operation is protected.

Onsite vulnerability can be avoided when a company's infrastructure is managed correctly. Cloud-based systems may seem complex, but the model has clear advantages in both ease of usability and security. Information can be accessed anywhere, but it is kept safe, typically many miles away from the hardware in use.

It could be that the only truly safe computer is one that is switched off, detached from the network and sitting behind locked doors, but that's not a viable solution in an industry that relies on cyber space. However, the right mixture of monitoring, penetration testing and updating host systems can go a long way to reducing the risk to the data centre. A tight, secure IT infrastructure should be at the top of boardroom agendas as the oil and gas industry becomes aware of potential threats. OGG

ADEPT4

Paul Talbot is adept4's founder and chief technology officer - infrastructure. He is a service delivery specialist with more than 25 years of practical and strategic IT experience, assisting businesses across industry. His special expertise is bridging the gap between technology and business needs. adept4 offers managed infrastructure, software, telephony and project management solutions that boost collaboration, productivity and compliance in the real world.

For further information please visit:
adpet4.co.uk

Driving the LNG industry

Energy consumption in LNG Plants

LNG air-driven systems are characterised by their enormous size and their substantial use of ventilation energy. Although the energy consumed by this large number of fans is small compared to the energy supplied by the plants, this energy consumption is attracting increasing negative attention for environmental reasons. On average, worldwide around 25 to 30 per cent of the generated electric power is used for ventilation. Nowadays, fans are used everywhere, from refrigerators to computers to air-conditioning systems. For the absorbed electric power of LNG fans, it is no exception to have three to six M/Watt of air-driven cooling. It clearly is time to look more closely at this high-energy consumption and find out how it can be made more efficient.

Bronswerk highest-efficiency ultra low-noise cooling

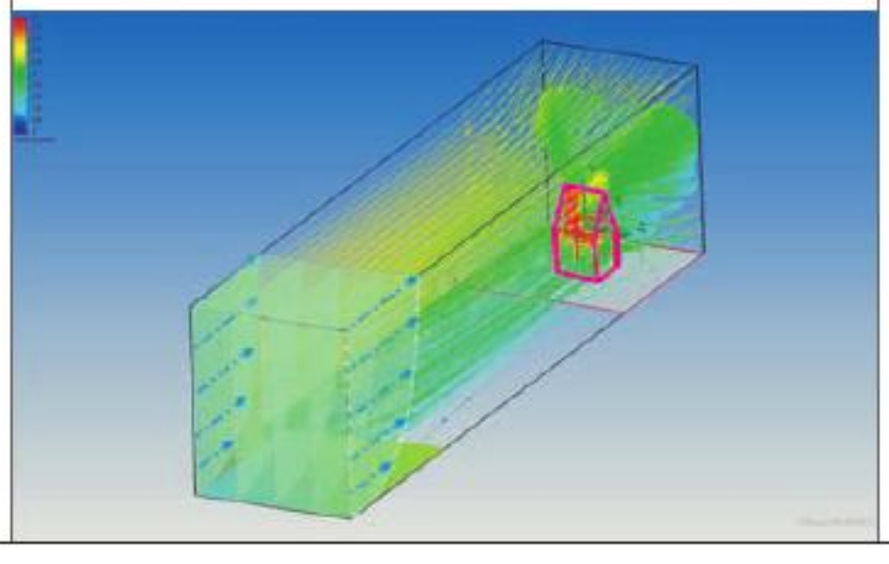
Using very advanced computer simulation programmes, Bronswerk has developed a fan that consumes less than half the energy currently consumed by the best fans. Also the Bronswerk fan is very quiet, making far less noise than the drivers it uses. This is important, given that air-driven cooling of industrial processes always takes place outside the building and the systems cannot be screened off without blocking the air supply, and therefore also the cooling effect. The sound-pressure difference between the Bronswerk fan and the quietest conventional fan on the market is five to six dB(A). This difference can best be illustrated in the following example: imagine you are talking to a friend in the street. A cyclist passes by and you continue your conversation. Then a moped passes by and you have to stop talking because you can't hear each other properly any more. That is a significant difference, and that is why the Whizz-Wheel® fan, as the Bronswerk fan is called, is raising air-driven cooling to a new level: **'Highest efficiency, ultra low noise cooling'**.

Superior features provide new opportunities

The market initially reacted with disbelief, but now that various systems are using Whizz-Wheel® fans of Ø 3 metres to Ø 10 metres, the new systems are gladly accepted. People have also realised that the superior features of high-efficiency cooling are providing new opportunities for the design of the systems. In situations where **noise** levels are very important – for example, in nature reserves (such as in Australia) – high-efficiency cooling causes minimum disturbance. In situations where **surface area or weight** is important, such as on floating platforms, the use of coolers with Whizz-Wheel® fans reduces surface area and weight, resulting in major financial benefits for the customer. And in situations where **energy savings** are important, Whizz-Wheels® can realise savings of around 50 per cent. Added to this – also very important – Whizz-Wheel® fans are much less sensitive to crosswind. Efficiency levels remain excellent even at higher wind speeds. To illustrate this, the effects of wind on the performances of the steam turbine condenser are described below. This clearly shows the difference in the amount of electricity generated when the condenser is equipped with conventional fans or with Whizz-Wheel® fans.

Wind effect

Air-driven cooling (A-frame) condensers are used for generating power using vacuum steam turbines in order to create better steam condensation. Due to the fan shape and the specific design parameters, conventional performance is normally very dependent on wind speeds. The VGB R131M (guide for performance testing or air-cooled condensers) stipulates that during capacity measurements the average wind speed should remain under three m/s. At higher wind speeds, the manufacturer can no longer guarantee the performances of the (A-frame) condensers. This is a very convenient standard for the manufacturers because it means they do not have to take disadvantageous wind effects into account in their designs!



Right
Fig 1. A-frame air flow

For the user of the system, the cooling capacity of the (A-Frame) condensers is not so important at wind speeds of less than three m/s. Fans have to deliver their cooling capacity at much higher wind speeds all year round. Particularly in windy (coastal) locations, this can lead to an enormous discrepancy between the desired and realised cooling effect. And if customers want the (A-frame) condenser to consume less electricity, this discrepancy becomes even greater. This is because the air-cooled condensers need to be increasingly economical with driver energy. There are two ways of realising this lower energy consumption:

1 Less air with a lower resistance level for the fans compensated by more condenser surface area (roughly a larger cooler with low-consumption fans)
2 Fans with much higher efficiency (more air), an optimal aerodynamic design and yet lower electricity consumption

In the first case, however, the resistance level of the fans is reduced so much that even a slight breeze can have a negative effect on the operation of the fans, and therefore also a negative effect on the condenser vacuum. The system will therefore be even more sensitive to crosswind, which means it will generate even less electricity to the power grid. However, the client won't notice this until after the start-up of the equipment.

With its Whizz-Wheel® fans, Bronswerk is purposely opting for the better, more efficient second scenario. This way, Bronswerk can realise a higher air-side fan resistance level and thus reduce the effect of crosswind. Thanks to the ultra-high yield of Whizz-Wheel® fans, lower absorbed electric power for the condensers can be realised under all operating conditions and in all seasons. The following table displays the wind effect on the yield.

Air quality in % in:	<3m/s	5m/s	7m/s
Conventional design	100	77.5	49.2
Bronswerk Whizz-Wheel®	100	91.6	79.2

The loss of cooling air results in a shallower vacuum. This leads proportionally to a lower generated power and to approximately ten per cent less electricity! For flat air cooled heat exchangers similar effects have been observed by Bronswerk. If you would like to know more about this subject or if you wish to receive a copy of the study report, please email femke@bronswerk.com.

Impact of new design opportunities

Noise: In the following example, the difference in the noise load of an LNG plant with 100 fans of 60 KW is calculated. In the calculation, it is important not just to take the noise of the fan into account but also the noise of the motor and transmission. In standard situations, fans and transmission each produce approximately the same amount of noise (sound pressure approximately 65 dB(A)). Because they combine, this results in a final load of 68 dB(A). The use of Whizz-Wheel® fans can achieve a noise load of just 50 dB(A) because only the motors and transmissions generate noise. In order to realise the full benefit of the fans, however, noise insulation measures will have to be taken so that the noise of the motors is less than the noise of the fans. In this way, an ultimate noise load from 100 fans of 100 x 65 ≈ 80 dB(A) would be realised in the old situation and only 60 dB(A) in the new situation.

Surface reduction and/or savings in weight:

Here, the gas evaporation towers are taken as an example (see photograph). These are actually gas heating towers. With this air-driven gas evaporation, the temperatures of gas (-80) and outside air (+20) are so far apart that Whizz-Wheel® fans can generate twice as much air with the same shaft power, and with a much better air speed distribution. That means that the entire cross section of the evaporation tower is well supplied with air, thus doubling the heat exchange. Twice as much gas can then be evaporated per tower, requiring approximately half the number of gas evaporation towers. This also results in a 50 per cent reduction in the costs for connecting motors and manifolds and, most importantly, it reduces the total weight by approximately 50 per cent, resulting in sustainable solutions, both directly and indirectly. On a floating platform, it will result in savings on the underlying steel constructions, which can now be much lighter. The savings on steel constructions will be comparable to the amount invested in the total system. This saving on steel is not only good for the customer's finances, it also benefits the environment. Because even the 'big players' want to act responsibly and protect the environment. O&G

> Using very advanced computer simulation programs, Bronswerk has developed a fan that consumes less than half the energy currently consumed by the best fans. Also the Bronswerk fan is very quiet, making far less noise than the drivers it uses

Left
Table 1. Wind effect on yield

Below
Fig. 2: Gas evaporation towers with Whizz-Wheel® fans; 50 per cent of the number of towers

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Energy savings:

The Whizz-Wheel® therefore makes it possible to be environmentally friendly and earn money at the same time. The extra investments in these fans can be recovered in three to ten years. A recovery time of seven years, for example, means a yield of approximately 14 per cent on the invested capital. There are currently very few investments that produce with such a high yield. Moreover, LNG plants very often have their own electric power plant for the fans. By using the Whizz-Wheel® fans the client needs only to install 50 per cent of the capacity compared to conventional fans. This is an enormous economic benefit.

De-bottlenecking

In view of the above, people often ask: "What does this mean for my plant?" and more specifically: "My plant is currently producing too little capacity. Can this be improved with the Whizz-Wheel®?" The short answer is that Bronswerk should be capable of improving the operation of your equipment (in order to be more specific, more customer information is required). Sometimes spectacular improvements can be achieved by cleaning the plant and sometimes it is cheaper to build a new plant. When the surface area is limited and/ or the system must comply with strict noise requirements, the Whizz-Wheel® provides unprecedented (sustainable and financial) options for de-bottlenecking.

How does the Whizz-Wheel® realise these positive figures for noise and energy consumption?

Winglets: Noise and drag are generated to a large extent at both wing ends (tips and conventionally at the hubs). Modern aircraft wing design shows the winglets at the wingtips. Our blades (wings) have no end in the sense that they are mounted in a co-rotating ring(rim) so the air experiences effectively "endless" wings; no tip vortices and hence, minimised drag and noise!

Number of blades (wings):

Increasing the number of blades decreases the aerodynamic and the mechanical load on individual blades. Slender blades, with a geometry set for optimal aerodynamic profiling from hub to tip, show very low drag minimising power use and noise generation. Hence, radialy highly twisted blades. Furthermore, a higher number of such blades decreases the power level of the audible frequencies. Whizz-Wheel®: 16 blades vs. the conventional four to six.

The air-inlet called the fan housing or fan ring:

A major result of the development is the insight gained by considering and analysing the air flow through the integral cooler. Advanced geometrical intake flow design, called quasi-ellipsoid, eliminates crucial deceleration of the incoming air along the fan ring towards the blade-tips, thereby maximising efficiency. The inlet dimensions are up to 50 per cent smaller in height than conventional bell-shaped inlet shapes.

Hub size:

As the hub would create a wake in the airflow, it is shaped integrally for minimising flow disturbances and reduce vortices on the wake side. Thus, reducing hub generated power-loss and noise generation, and above all providing better flow coverage at the centre of the heat exchanger pipe bundles.

Total weight and dimensioning:

The monolithically shaped, ultra-stiff but slender, Whizz-Wheel® structure, the quasi-ellipsoid compacted inlet and the ultra-low power driving system, reduce the weight of the total functional Whizz-Wheel® assembly up to ca. 50 per cent.

Innovation and the future

Bronswerk roots its long-term continuity policy strongly in innovation. The innovation activities have yielded a number of remarkable, patented technologies and products, such as the Whizz-Wheel® fan, bringing substantial advantages for our customers. In this article the three ways in which the Whizz-Wheel® can contribute in using energy much more efficiently in the LNG field have been highlighted. For the LNG field this means improved sustainability with economic benefits for; noise level reduction, surface area or weight reduction, energy savings, and de-bottlenecking. OGC

For more information or to find out what this can mean for your system send an email to: femke@bronswerk.com.

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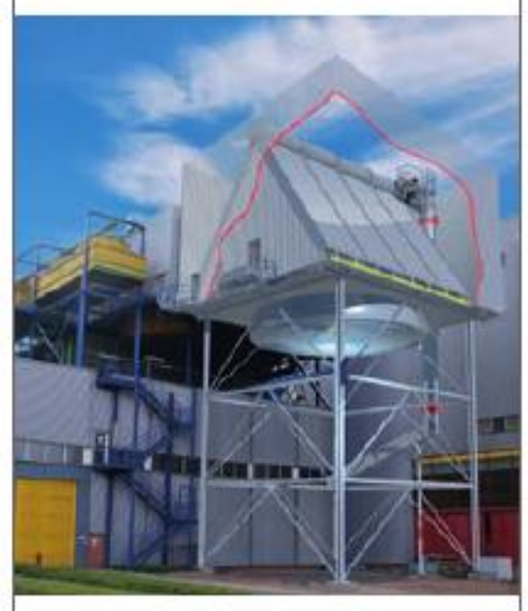

Above
Fig 3. Whizz-Wheel® installations

Your mat specialist

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It's all about time

Mammoet's history began

in 1807 when its founder foresaw the growing demand for transportation in an increasingly industrialising society. Today, Mammoet helps clients improve construction efficiency and optimise the uptime of their plants and installations by providing solutions for lifting, transporting, installing and decommissioning large and heavy structures. Mammoet's services focus on the petrochemical and mining industries, civil engineering, power generation and offshore projects.

Logistical challenges imposed by heavy industries are growing daily, with factors such as remote locations, harsh climates and a strong emphasis on the environment driving the business towards smarter and safer solutions. Accordingly, Mammoet's services comprise of heavy lifting services, heavy transport services, plant turnaround/shutdown management, site-wide construction services, modular construction, factory-to-foundation logistics, emergency response and wreck removal, decommissioning of onshore and offshore installations, trading in new and used equipment worldwide.

Mammoet possesses unparalleled expertise at moving large and heavy objects. It draws upon that expertise to design, plan and deliver smart solutions for its customers that move their deadlines forward, improve the uptime of their plants and installations and reduce the cost of ownership. The company recognises that, ultimately, for its customers it's all about time. Or, as Mammoet puts it: 'Time isn't set in concrete, or forged in steel. But it's the biggest thing we can move for our customers.'

At the forefront

Over the years, Mammoet has executed numerous construction lifts, yard moves, load-outs and factory-to foundation projects in a wide range of circumstances. By drawing on the knowledge of its experienced team and utilising its large pool of specialised equipment the business is able to come up with new approaches for safely and quickly loading transportation jackets and platforms to offshore destinations. New construction approaches are made possible by its established push-up system and gantry lifting services.

The company is continually at the forefront of industry innovation. Recently it has won the European Association of Abnormal Road Transport and Mobile Cranes (ESTA) Innovation Award for its special skidding system that is in use at Chernobyl in the construction of the New Safe Confinement (NSC) structure being built over the reactor.

During the construction of the NSC, Mammoet will lift the structure in stages and in the future will skid it across the reactor. The completed structure will be approximately 110 metres high and 165 metres long with a span of 260 metres and a weight exceeding 35,000 tonnes. As part of the project, Mammoet also developed and built a dedicated, fully remote-controlled skidding system to position the arch sections. The system has 116 skid shoes with a capacity of 703 tonnes each. The angle at which the two skid tracks on each side are installed optimises the transfer of the huge load to the foundations. The skidding system is synchronised to avoid stressing the structure of

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the NSC and the skid shoes are customised to lift, shift and move the load.

Petrochemical construction projects

Mammoet has a longstanding relationship with the petrochemical industry. Armed with a large fleet of specialised equipment, top engineering expertise and years of operational experience the business helps to optimise plant construction schedules. Its portfolio of work includes a variety of refineries and chemical plants in locations around the globe.

Preferred standard in shutdown projects

Mammoet also has high-level insights and longstanding hands-on experience in executing petrochemical maintenance and shutdown projects. The company's engineers and project managers are involved in projects from the earliest stages of shutdown activities. Early co-operation between all subcontractors enables co-ordinated, efficient, and safe execution of maintenance activities, which improves turnaround times whilst maintaining the highest standards of safety performance. Their detailed approach has a positive and significant effect on total downtime in shutdown projects and the associated costs thereof. For some Mammoet customers, this approach has become the preferred standard for shutdown management.

Mammoet Versatile Ballast System

In May 2014 Mammoet introduced its Versatile Ballast System at the Offshore Technology Conference (OTC) in Houston. The installation of offshore platforms by float-over method is time consuming and costly. The Versatile Ballast System simplifies and combines ballasting for load-out and float-over operations in one system. This eliminates the need to convert the ballast system after the load-out, speeding up the platform production date considerably. The system needs less equipment, manpower and time to be installed – apart from the fact that a large part of the installation can be executed on the quayside, meaning that the time needed for barge rental is shortened significantly. Also, decommissioning the system takes up much less time. Sophisticated, yet simple, the fully modularised system is easily installed and fits any barge without the need for modifications. The system was designed with efficiency and safety in mind. The modular and fully containerised design contains all standard elements, simplifies transportation and increases safety of the operation.

Achieving excellence

Of course, Mammoet's position as the world's leader in engineered heavy lifting and transport is held not just through innovative design, but also in its approach to customer service, ensuring that the best service is provided. Recognised for its efforts in this area the business was invited to attend the annual Costain Awards Ceremony, winning the 'Achieving Excellence' Award for Supply Chain

LGH HIJSMATERIEEL B.V.

LGH Hijsmaterieel B.V has, for more then 20 years, been the rental company of choice for lifting and handling gear equipment for Mammoet Europe. With more than 100,000 items of lifting and handling gear, we specialise in the provision of hire equipment – and have been able to support Mammoet almost every day. Our expertise, experience and state-of-the-art facilities enable us to provide bespoke solutions that meet even the most individual and complex lifting project requirements.

HEF & HIJS NEDERLAND

Hef & Hijs Nederland (HHN) truly enjoys helping Mammoet getting the job done.
Projects can't be put on hold; work has to continue and HHN partners with Mammoet as a true expert in lifting gear management. The short or long-term rental of an extensive range of hoisting and lifting equipment, fall protection and climbing equipment is the main business of HHN. Mammoet and HHN believe that safety and quality can always be improved.

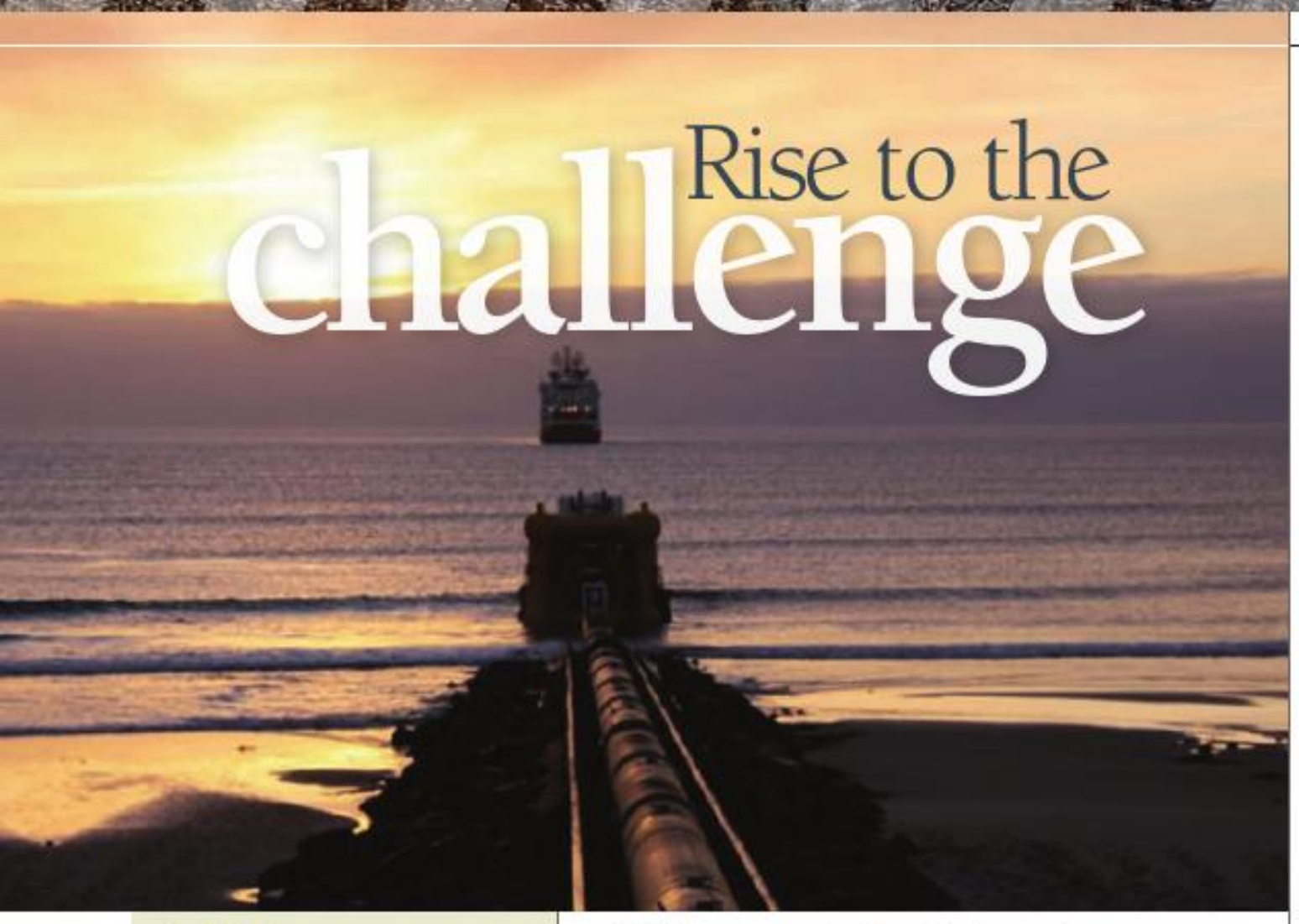
Partner Of The Year 2013. Nomination for the award was on the back of the continued excellence during the execution of the Evap D Project at the Sellafield Nuclear site, where Mammoet's tailor-made four-way gantry system ensured a safe approach and additionally saved two months of construction time.

Mammoet has also gained experience building wind farms all across the globe in diverse circumstances, where its specialised equipment reduces civil works requirements and helps extend weather windows. In operations that began in April 2014, Mammoet has been using its Liebherr LR13000, the biggest crawler crane in the world, to install four platform legs on Van Oord's newest wind turbine installation vessel, the Aeolus. Erection of the giant crane took 12 days, its mammoth structure reflecting the strength required to lift the first of four 87-metre long steel platform legs, each weighing 920 tonnes. Mammoet designed, fabricated and delivered tailor-made top lifting tools and a tailing frame to ensure that the legs, that have no lifting points, can be lifted securely. In addition to the platform legs, Mammoet will also install four spudcans using a specially engineered method that involves placing partly rigged spudcans on the seabed, moving the Aeolus over it and connecting the spudcan with the leg using a combination of cranes and divers. The whole project was completed within two weeks, ready for the vessel to be operational in July 2014. O&G

> Mammoet helps clients improve construction efficiency and optimise the uptime of their plants and installations by providing solutions for lifting, transporting, installing and decommissioning large and heavy structures

Mammoet
mammoet.com

Services
Engineered heavy lifting and transport services



Rise to the challenge

FQM

FQM is an international HSEQ consultancy and training company, helping clients achieve and retain the highest standards in ISO accreditation and ongoing performance assurance.
Each project is assessed by industry experts to provide individual, quality solutions appropriate to the risk criticality, complexity and size of operation.
FQM has provided support to Flexlife for four years, designing, documenting and implementing their Integrated Management System (IMS) and assisting with internal and assurance audits of the supply chain.
FQM has also provided project HSEQ management including; chairing HIRA's, developing project HSEQ plans, interface documents and supporting mobilisations, on-site safety coaching and day to day back-up to project teams.

Below
Ciaran O'Donnell, CEO of Flexlife

Unbonded flexible pipes have been deployed in the global oil and gas industry for more than 30 years, and historically they have proved their extreme reliability. However, like all long serving products, they can suffer integrity problems over time, and a lack of inspection or maintenance can be one of the biggest issues affecting their performance.

Life of field subsea engineering and technology company, Flexlife is an expert in providing specialised support to the subsea sector and has a sound knowledge and proven track record in understanding the design and manufacture of flexible pipes, and is well placed to advise on their integrity, having carried out hundreds of inspections on such pipes over a number of years. Its approach to subsea integrity management combines systems development, operational execution and product/service deployment in an integrated package to minimise risk and maximise asset uptime.

The company was established to offer true operational experience and a 'solutions-based' philosophy. Flexlife offers a range of service offerings and engineered solutions to meet the needs and subsea challenges of its customers including inspection, monitoring, protection and repair solutions. The company has accrued an enviable breadth of Subsea Integrity Management (SSIM) and Subsea Project Management (SSPM) knowledge through its breadth of work with operating companies in the UKCS and globally.

The company has grown up fast, now in its seventh year, in large part because it has positioned itself in a very specific niche in the integrity of flexible production riser systems. Following an extremely successful and busy 2013, Flexlife continues to drive its expansion globally with a particular focus on the Gulf of Mexico, where it is finding that the US operating companies based in Houston have a growing interest in flexibles and the expertise that Flexlife brings to this market.

Flexlife recently presented at the NACE Corrosion 2014 Conference in San Antonio, Texas. This event was designed to collaborate, educate and research recent innovations and mitigate corrosion.

As part of the technical programme, Flexlife gave a presentation on the concept, results and benefits of applying an index-scoring model for pipeline corrosion risk assessment and management of the Apache North Sea pipeline network. The talk focused on how the model, which incorporates established corrosion assessment techniques, has been used by Flexlife to quantify the threat of corrosion and lessons learned through implementation, this presentation was well received by the GOM operating community.

Corrosion is only one problem that can significantly reduce the operating life of a pipe, which can then lead to failure and potentially a risk to life or the environment. As an example, for a typical riser of about 350 metres in the North Sea, Flexlife has estimated the financial impact at approximately £3 million, once vessel time and replacement costs have been included. Add to that a current lead time of at least a year, with all the implications associated with deferred production, and it becomes clear that effective integrity management, including regular inspection, repair and ongoing maintenance of risers is a much more cost-effective solution.

The North Sea has traditionally led the way in developing robust and proactive riser inspection and integrity plans on the back of stringent regulation. However, regulatory requirements around the world differ. An outer inspection by an ROV may miss outer sheath damage leading to internal issues in such a complex structure as a flexible pipe. It only takes a hole the size of a thumbnail in an outer sheath, letting seawater in, to potentially create localised corrosion and corrosion fatigue.

The Houston branch of Flexlife is an important division for the company, working closely with the Aberdeen head office. The company moved to Houston looking for a broader variety of clients, and it is now working with a wide range of blue-chip customers, including Petrobras and Murphy Oil. In fact, Flexlife has generated a lot of interest from its Houston office, and the company has plans to expand its operation there over the coming months. O&G

Flexlife chief executive Ciaran O'Donnell said of the office in 2013: "The Houston base has gone from strength to strength in recent months and we have no doubt our operation will continue to grow in its capabilities and contract wins. Flexlife has established itself as a major player in North Sea operations, and these skills transfer well to the Gulf of Mexico. With our growth in Houston, Flexlife has continued to add to its reputation of offering complete subsea integrity solutions internationally."

Its Tyneside satellite office has also seen success, as Ciaran noted: "With our growth in Newcastle, Flexlife has continued to build on its reputation for offering technical excellence, assisting our clients to cost-effectively manage all of their subsea assets and infrastructure. Essentially, we help give our clients peace of mind that they have accurate data on their subsea equipment and the Newcastle base has played a major role in this."

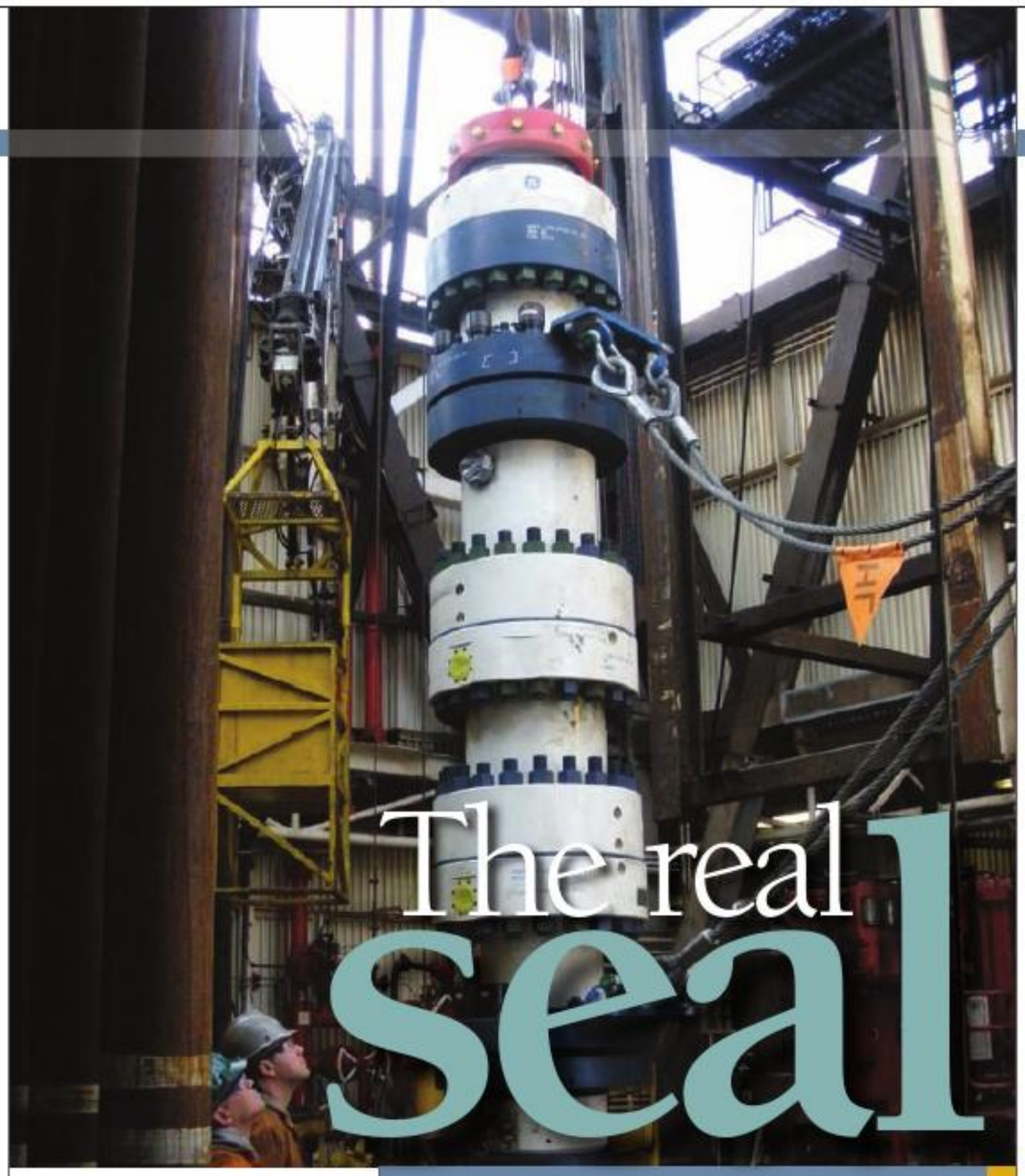
Operations in Newcastle focus on flexible pipe technology, delivery management, and integrity management, along with providing support for the wider Flexlife organisation. The Newcastle office has assisted international clients in the Gulf of Mexico, UK and West Africa.

The story of Flexlife has been one of quick success and engineering solutions to meet the challenges customers face has been a strength that has positioned Flexlife as the 'go to' for flexible risers. The company has developed a number of innovative technology solutions, which it has brought to market and which are now becoming the norm in the North Sea. One such technology, Neptune, is a unique ROV mounted subsea inspection tool designed by Oceaneering and utilising Flexlife's patented UT scanning technology in order to determine the state of a flexible riser's annulus with 100 per cent accuracy. Global growth of this scanning technology is planned for 2014.

An industry leader in flexible pipe engineering and technology, and managing the whole subsea infrastructure for major operators in the UKCS and globally, Flexlife has proven itself as an innovative and forward-thinking company, and its investors and management, are all keen for Flexlife to continue its rise to support the future subsea needs and challenges of its customers. O&G

CAIRNDENE

Using its innovative approach to Primavera P6 and project management, Cairndene supported Flexlife with a structured, systematic process that assessed, upgraded and ultimately improved their project planning. Flexlife started with two unique instances of Primavera P6 filled with duplicated data. Cairndene rationalised, cleansed and migrated the data into one fully integrated database, with no interruption to service. Flexlife now benefits from the improved data quality delivered by this project.



The real seal

Above
POS-GRIP 15ksi HPHT Exploration Wellhead System

Plexus Holdings plc is a company founded on innovation, challenging the market to change the future of wellhead safety and operating standards. In 1997 it secured a patent surrounding its pioneering friction-grip method of engineering, POS-GRIP®. The innovative method provides a unique and patented method of gripping and sealing casing in a wellhead which is safer and quicker to install than existing conventional wellhead technologies, and which results in significant time savings and therefore cost reduction.

In a recent interview, CEO Ben van Bilderbeek and finance director Graham Stevens revealed the subsequent work undertaken towards further developing the POS-GRIP method of engineering, and extending its range of applications, particularly for subsea fields. "There are particular scientific principles that must be adhered to in the provision of metal-to-metal sealing, necessary on subsea wellheads."

When drilling on land, the wellhead is easily accessible, but in the deepwater climate of today's subsea drilling activities, which can be located 12,000 feet beneath the surface such access is simply not possible. The seal is key to the integrity of the well and must prevent pressure from the smaller diameter high-pressure pipes from reaching the larger pipes, which have a lower pressure containment rating.

"These annular seals have to last the entire life of the well so the seal is absolutely critical to long-term survival of a subsea well," points out Ben. As the industry moves from operating at 10,000 PSI to pressures of 20,000 PSI in regions such as the Gulf of Mexico, the North Sea, offshore Malaysia, Indonesia and the Arctic it is widely recognised and accepted that elastomeric seals are unacceptable. "The general standard recognises the use of metal-to-metal seals. The challenge lies in implementing the sealing effectively when you are 12,000 feet away from the section.

"As we progress through the development of a new class of subsea wellhead systems based on the friction grip method of wellhead engineering, we have studied very carefully what circumstances one has to create for a metal-to-metal seal to work, and work for the life of the well. It is these circumstances that we have started to identify as the key to delivering a system that, with a degree of science, can claim to provide metal-to-metal sealing, which is so critical to the whole process," he adds.

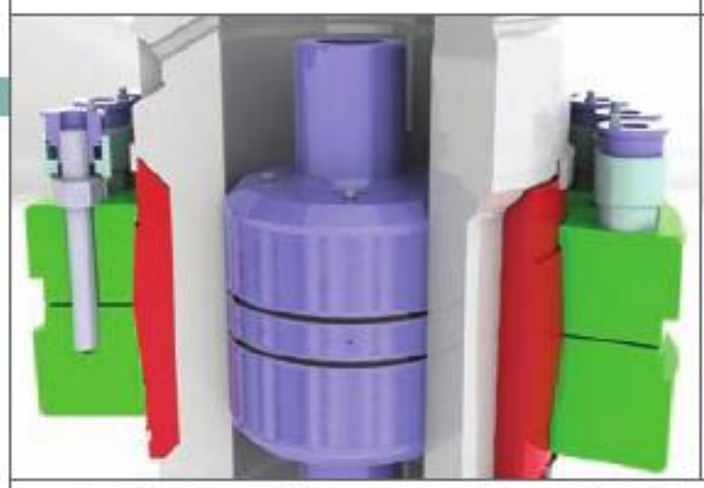
The key to using metal-to-metal seals at high pressure and high temperature in a remote application is being able to deliver a known amount of force to the areas of interface between the inner pipe and the outer pipe. "You need to know exactly how much force you deliver and it has to be sufficient at the interface between the casing hanger, the end fitting to the inner pipe, and the well head housing, the end fitting to the outer pipe. The right force must be delivered at the point of contact so that the metal seals are energised. If too much force is applied then the resilience of the metal will be lost, deforming permanently. If there is too little stress then the fluid will leak by. There is a narrow band of stress that must be delivered so the deployment of the gripping force that delivers the force to the interface has been very closely controlled, managed and recorded," explains Ben.

During the initial phases of product development POS-GRIP technology was created as a method of supporting oil field tubulars with an externally activated radial friction grip. Its first major application within the oil and gas industry was through the introduction of an adjustable rental wellhead system for jack-up exploration drilling. This consequently led to the product development in the specialised high pressure and high temperature of HG production wellhead systems with all internal parts qualified to 20,000 PSI.

In 2010 Plexus launched a joint industry project (JIP), working with oil and gas operators developing a new subsea POS-GRIP wellhead design. Commenting, Ben says: "Our system hydraulically delivers the gripping force with a known amount of pressure. This is delivered to the interface between the wellhead and the casing hanger by means of a precisely controlled, measurable and specifiable friction grip force. We believe that we can deliver this technology with the same efficiency and effectiveness, but with even more significant time savings than we have achieved on the surface with jack-up rigs. Over the last 15 years we have completed 350 wells, and the focus of the subsea JIP is to make the external gripping work under water."

A major milestone for the business was reached in May 2014 when all the partners from the JIP contract met with Plexus in Aberdeen to inspect the equipment currently in its test facility. "We believe that the connection in the wellhead must be as good as any other connection currently tested to a much higher standard. Leading the way forward we have, we believe, uniquely qualified the casing hanger and wellhead interface to exactly the same standard as that of the premium couplings used in the well," highlights Ben.

Below POS-GRIP closed



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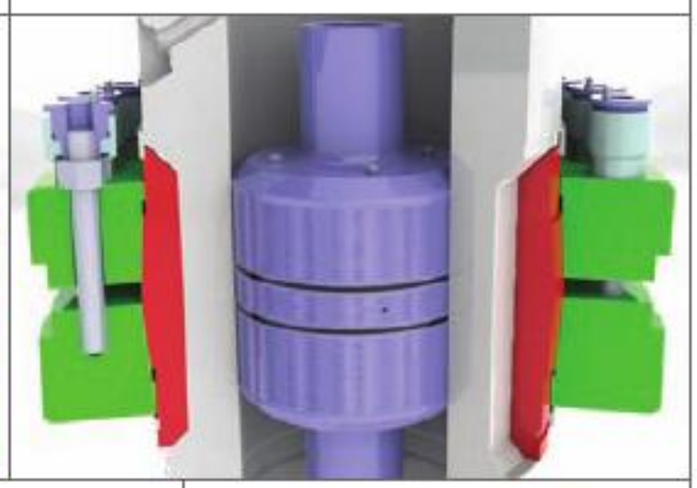


Plexus Group has been responsible for the change in global drilling standards in the oil and gas industry through the ongoing delivery of innovative equipment and services. "As our subsea JIP continues to develop and our scope of thinking changes, feedback from industry plays a significant part in that," says Graham. "In the past year ENI and Total have joined the project. The eventual design will have had the input and support of this formidable set of international oil and gas operating company partners," he concludes.

Above
Ben van Bilderbeek, CEO of Plexus Holdings Plc

Plexus Holdings Plc
plexusplc.com

Services
Engineering wellhead solutions

A history of success

Founded in 1957, the Mainport Group has grown to become a leader in the provision of marine services to ship-owners, exporters, importers, oil companies, seismic survey companies and others involved in the maritime trades.

Today the Mainport Group trades in Ireland, South America, the Middle East, Africa, Malaysia and the European Union. It has four offices in Ireland, based in Cork, Foynes, Limerick and Drogheda as well as offices in South Africa, Angola, Canada, Brazil and Singapore. Its fleet consists of 11 vessels, including tugs, platform supply vessels, and seismic support and chase vessels. Mainport currently employs 200 people covering its shipping, stevedoring, agency operations and worldwide crew. This dedicated team of enthusiastic, experienced and talented personnel is key to the group's success – the staff are all highly qualified in their fields, and have developed the knowledge and expertise needed to deliver imaginative solutions to virtually any challenge. Valuing all customers equally, the team strives to provide the best possible service through open dialogue and close working relationships; a winning formula that has resulted in long-term clients, some of which have worked with Mainport for more than 40 years.

As marine director Captain Dave Hopkins noted, the company has had an interesting history, evolving as it has from Ronanye Shipping - a one-man company originally founded by Finbarr Ronayne. Over its five decades of history the Group has experienced mergers, acquisitions, and continuous additions to its fleet in order to become a leading maritime organisation, with worldwide operations.

When it comes to the oil and gas industry, Mainport provides supply base operations for the exploration companies that work offshore Ireland, and historically over the years most of the major companies have been serviced by Ronayne Shipping on the Irish Coast including Marathon, Texaco, Exxon Mobil, Providence, Conoco, British Gas, Chevron and many more.

Capt Hopkins' own career has also evolved alongside Mainport Group – he came on board in 1979 serving as a master offshore in the company's offshore supply vessels and then as marine superintendent and marine director from 1987 and became a shareholder in 1994. He gave a bit more detail about the services provided by Mainport to the oil and gas industry today. "The main services provided on land are oil base management for all the oil companies exploring offshore Ireland," he said. "This works together with the stevedoring and agency business for the wind farm business, and other import and export business within Ireland."

The company's tugs provide berthing and unberthing services for ships mainly on the Shannon Estuary, but also in other Irish Ports where requested as well as coastal towage and salvage. "One of our MRV's supports the two platforms and Kinsale Gas Field and has done so since 1979. Our seismic fleet operates on a worldwide basis and supports the major seismic companies fleets in their various programmes around the world. Presently we have vessels in Canada, Equatorial Guinea, India, Qatar, and the North Sea," he added. "In the offshore business here in Ireland we are working with Kinsale Energy, Providence Resources and Exxon Mobil, while our seismic support vessels are at work for Western Geco, CGG and Dolphin."

Mainport has recently taken delivery of

two new seismic support vessels to the fleet, delivered in 2013 and purpose-built to address the needs of clients. Added Captain Hopkins: "They are deployed worldwide with the Mainport Cedar working from Qatar with WesternGeco on a shoot for Total and the Mainport Pine based out of Halifax Nova Scotia working on a WesternGeco shoot for BP." They support the fleet worldwide in fuel supply, stores, crew changes, and towing and escort/ chase duties where required.

Although Mainport is seeing good results from its seismic vessels, Captain Hopkins believes that the seismic support market is probably static now, 'as some seismic companies move to de-rig older seismic vessels.' He highlighted that new vessels are a challenge that the company must tackle going forward: "Building new vessels to replace older converted tonnage at a realistic price that suits the seismic companies and achieving long-term charters for them, is going to be something that the industry has to address," he said.

In order to maintain and grow its business while some markets are returning to full growth, Mainport focuses on safety in order to stand out from the rest of the competition. "We work very hard to maintain a very high level of safety in all our operations and this is evidenced in the high marks we continue to achieve in our audits from our customers," confirmed Captain Hopkins. "Mainport's long-term business success depends upon the ability to continually improve product and service quality while safe guarding people and the environment."

The company also adheres to the highest international standards including those set by Class and Flag State, ISM, ISPS, and ISO 9001. It is also a member of many of the trade organisations in areas where its fleet operates, including ISU, ETA, ERRVA, ICOS, ISAA and others.

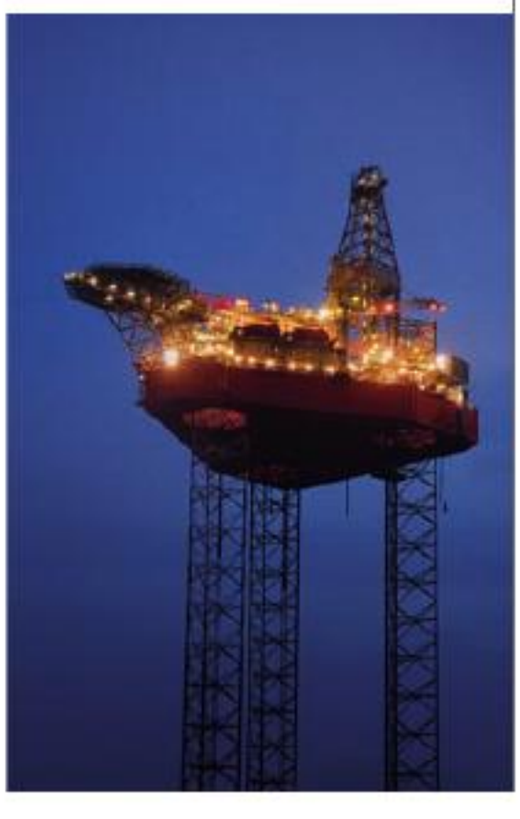
As the second half of 2014 unfolds, Mainport is planning further growth, as well as working on a few new projects for offshore vessels. "We are working and if they come to fruition, then 2014 could be a very interesting year," concluded Captain Hopkins. O&G

> The Mainport Group has grown to become a leader in the provision of marine services to ship-owners, exporters, importers, oil companies, seismic survey companies and others involved in the maritime trades

Irish Mainport
mainport.ie

Services
Integrated marine services

Motion monitor

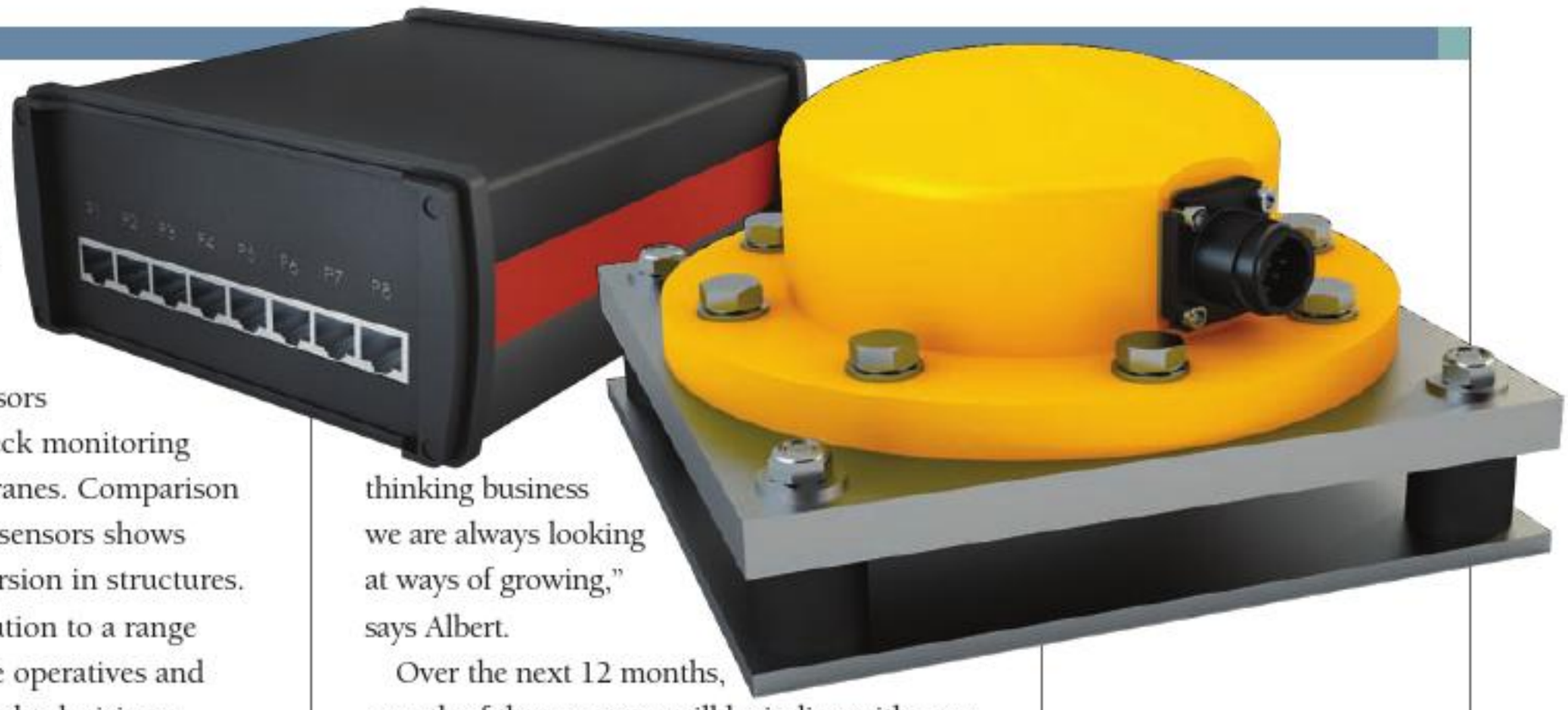


In 2003 Siri Marine was established as a consultancy firm, led by master mariner Albert Lenting. As managing director of the firm, his entrepreneurial flair was derived from a career history defined by roles as a deck officer and captain on diving support and top support vessels. With experience in project management, he additionally worked with major offshore construction businesses and within the ship building industry in the Netherlands.

Determined to channel a new path in the industry, Albert began looking for innovative solutions that the market required, as he explains: "A business acquaintance had been developing hi-tech motion sensors. Together we saw an opportunity in furthering the technology into decision support systems." Primarily at this time the system was used by the merchant navy, as from a cargo safety point of view it highlighted the forces acting on the vessel and produced the results in an easy to understand way. The solution enabled the operatives on the bridge to take the correct action at the correct time to prevent cargo damage. "From there we continued developing the system for other sectors, particularly oil and gas where cargo safety and transport safety is a big issue," he adds.

A major milestone for Siri Marine came in 2006 when Albert decided to take complete control of the manufacture of the sensors. Having had an equal share in the business up until this point, the change in ownership led to continued growth and the employment of a strong workforce. The appointed workforce is made up of ex-seafarers with strong roots in the maritime industry. Its employees are at hand to apply their specialist knowledge assisting all aspects of the business. Geographically positioned in the Netherlands the company has built up a network of contacts, positioning itself as a world player utilising agents that play a role in locations where demand is high.

"Our latest generation of motion sensor, the JF40 is showing great potential. In May 2014 we attended OTC in Houston where we received a very positive response from existing and potential clients," highlights Albert. Split into two separate lines, Siri Marine offers the service as a complete package undertaking the installation itself, and this business remains steady. However, the secondary aspect that entails the supply of the systems to third parties for use in their own applications is of growing demand as he points out: "The traditional market of installing rental sets on equipment



and assets is still continuing well, but the last 12 months has been highlighted by the demand for sensors and third party application."

This market is led by the demand for motion sensors in situations such as heli-deck monitoring and heave monitoring on cranes. Comparison between two or more of its sensors shows deformation, flexion and torsion in structures. The product provides a solution to a range of applications, assisting the operatives and management to make the right decisions. "Innovation within our business is promoted through the continual improvement of our own sensor technology and the latest generation is a completely new design. We also are very busy with developing a complete package on fatigue monitoring, foreseeing that condition monitoring on platforms will be a bigger part of the portfolio in the future," explains Albert.

Siri Marine is in the process of providing motion sensors and environmental sensors to a fleet of new build jack-up rigs for Seadrill with construction undertaken in China. Under its international umbrella the business is working on several contracts in the Far East undertaking fatigue consumption and condition monitoring calculations. When Albert first launched the business the product concept was new. As the product has gained attention over the years, demand has steadily grown, as too has the competition in the field. Looking ahead Albert says: "The challenge as we move ahead is to stay at the forefront of the industry, bringing in new, fresh products that make a real difference to our customers. As a business we want to offer exclusive products and remain the specialist that customers call upon."

Being small, flexible and able to respond quickly to client's wishes have proven to be a positive strength in the industry. Operating in a highly specialised field the knowledge within the company supports the provision of answers to the customer's questions at the earliest time. Expansion within the specialised business is a steady process, and the appointment of agents requires time to ensure sufficient in-depth product training is undertaken. However, as the business continues to grow it looks toward future talent. "On a regular basis we take students from universities and high schools under internship programmes. As a forward thinking business we are always looking at ways of growing," says Albert.

Over the next 12 months, growth of the company will be in line with new product development, as Albert concludes: "The newly developed sensor is a product that we see has a growing interest. We are also targeting the offshore market through focusing on fatigue monitoring on platforms and jack-ups. As we continue to develop our service offering it remains fundamentally important that we establish ourselves as the number one provider of motion sensors." O&G

Pulling forward

I.P. Huse has a close association with the local community on the Norwegian island of Harøy, where it is has a rich history dating back as far as 1903. The company was originally involved in a number of the region's industries including fishing, shipping and barrel making before delivering its first anchor handling winch in 1970. This would mark a key development in the company's history as by 1982 full focus was shifted to the design and construction of anchor handling winches, which has proven to be a robust base for I.P. Huse ever since.

Outlining the development of the winches designed by the company technical manager for E&P, Morten Hopland says: "The first winches were very small compared with today's massive constructions. The weight of a modern winch package is more than ten times the weight compared to the first packages that were delivered during the early 1970s. During the 1990s there was a period of lower activity relating to supply vessels so I.P. Huse shifted focus and made several deliveries to turret-moored floating production, storage and offloading (FPSO) craft."

The Island of Harøy has a population of only 1300 people, more than ten per cent of which are employed by Huse. The company's staff of around 130 dedicated personnel, close integration with the local community and a network of suppliers allows Huse to deliver bespoke products and excellent quality, as Morten explains: "We have a stable and professional workforce that is interested in exploring new production methods such as robots and highly automated machines. This combined with a reliable network of sub-suppliers makes it possible to maintain a good and reputable status within the offshore market. We believe that there is no taking chances with the lives and values of our customers at stake."

Furthermore, Huse ensures that it maintains a strong engineering and fabrication core of staff that will see the company into next decade of the company's history, as Morten observes: "We operate an apprenticeship scheme within the company and we support students to help their talents throughout their education. Currently we have around ten trainees on site through several different programmes."

The winches supplied by Huse service anchor handling tug supply (AHTS) vessels and the exploration and production market within the oil and has industry, where it supplies mooring systems for drilling rigs, accommodation platforms, barges and FPSOs. Typical mooring systems are comprised of winches, sheaves and fairleads. The company offers windlass winches that have been utilised on semi-submersibles, O&G

25 år

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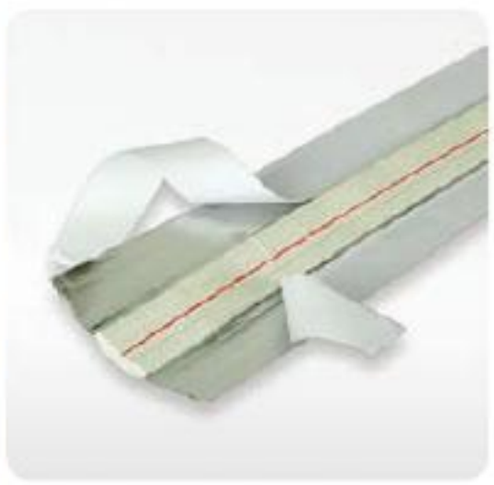

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FPSOs and SPAR buoys. The main advantage of the design is the low lifecycle cost with reduced maintenance. Huse has supplied windlass winches that have served up to nine mooring lines and have a capacity of more than 350 tons. Fairleads are utilised to guide wire ropes or chains from the vessel towards the anchor and Huse has designed several fairlead variants that meet the requirements of a range of sizes and applications. Servicing of winches and equipment is an important part of the business, which is undertaken by Rolls-Royce Marine, with which Huse has had a strong relationship since the 1940s. Additionally, Rolls-Royce Marine represents the main customer facing point of contact for the company and this allows Huse to reach customers through the highly respected strength of its own brand and the equally highly regarded Rolls-Royce name.

"The company's key customers are its end users, shipyards and ship designers," Morten says. "We have been in the market for more than 40 years and continue to serve our customers and deliver equipment today as we intend to in ten to 20 years from now. We still deliver spare parts for winches that we delivered 40 to 50 years ago and the fabrication drawings and documentation are available for all of the products that we have ever delivered."

Close co-operation with the local community and businesses plays a vital role in ensuring that Huse is able to deliver the correct solution to clients' requests and enables the company to continue to develop market-leading products as Morten elaborates: "Our best research and development is the close co-operation that we have with the cluster of marine businesses on the north west coast of Norway. Through open and direct communication with ship owners, operators and oil companies we are able to find the important balance of new products and the safe and reliable equipment that we are already known to supply."

Following the global economic downturn the fortunes of many of the world's markets have been volatile and unpredictable, which has resulted in challenging trading conditions for companies within both the oil and gas and maritime industries. However, through remaining adaptive and servicing several markets Huse has managed to remain both strong and competitive. "The ability to work in a very variable market has been one of the key elements of the company's success," Morten explains. "We use the slow periods to prepare the business for the busier times that we know will follow. Even when we have experienced a low number of orders we have never sent people home, but rather nourished the knowledge that is within the business and installed new and upgraded machines so that when the market revives, we are ready."

As the global market begins to recover, Huse is positioned to deliver a strong presence with both existing and new market regions. "The last 12 months have been generally slow, but we hope to see a growth in the demands for our equipment over the coming months and years. We are prepared and will serve our customers when they need us," he says.

"We see huge opportunities in immensely different parts of the world, we anticipate possibilities in the Arctic region on one had and the potential for FPSOs in Brazil on the other. The next 12 months will be tough, but by the end of 2015 we hope that we will succeed in some of the exciting projects that we are currently working on." OGC

NST

I.P.Huse AS has been using NSSW seamless flux cored wires from NST for almost two decades. One of the main products has been the SF-3A(NVE Grade E) wire designed for welding carbon steel with impact requirements down to -40°C.
Stable mechanical properties, low hydrogen content and safe deliveries have been key ingredients to this long lasting business relationship.
NSSW flux cored wires are widely considered to be the industry standard in Norwegian offshore yards.

I.P. Huse AS
iphuse.no

Services
Design and construction of large winches

A capital investment

Above
High pressure jet washing

Top right
Pit and tank cleaning

Operating a specialised

business providing environmental services, MSIS has developed a forceful reputation as a leading niche service provider. Since the company was founded in 1998 it has grown and now operates from two bases in Inverurie and Invergordon, and is well positioned to service and grow further to serve its key markets.

Throughout its history the MSIS brand has remained highly recognisable for the quality of its service operations and notable for its impressive growth, as David Skinner, managing director elaborates: "MSIS has built on its enviable reputation over the years and has continued to grow. We currently have a three-year plan for further growth and as part of that initiative there has been some significant capital investment in equipment and staff. We see a very good opportunity in the market place for us as we consider ourselves to be a specialist in what we do and there is a growing demand for our services from our client base."

MSIS is proud of the bespoke environmental services and equipment that it provides. MSIS operates both onshore and offshore. The traditional markets that the company was founded on are utilities and distilleries, however the growing market for the company's services is in the oil and gas sector and this now accounts for 70 per cent of revenues. "This is where we see our future growth," said David.

Within the oil and gas market MSIS is very strong in the floating production storage and offloading (FPSO) sector of the industry, where it provides specialist cleaning in both in situ operations and in docks and other secure environments. This has enabled the company to execute successfully challenging projects for some of the most recognisable names within the oil and gas market. One such example was an FPSO cleaning project undertaken on behalf of BP to solve a long-standing hydrocarbon problem. MSIS was tasked with supplying a bespoke cleaning solution to the company's Schiehallion FPSO vessel, and the project called for the removal of 120 tonnes of highly viscous hydrocarbon residue from the vessel's port and starboard tanks. This gave MSIS the opportunity to showcase its Premier Transfer System (PTS). The PTS system was selected as the best-fit solution to the task at hand and the removal of hydrocarbons from the vessel was achieved on time and without incident.

By combining safety, training and market leading innovation MSIS is able to create tailor-made service solutions for its clients. Within the oil and gas sector its services include specialist cleaning, rig maintenance, emergency response, retro jetting, CCTV inspection, norm decontamination and waste management. Bespoke solutions are available alongside well-established techniques and these are further complimented by the company's range of professional services comprising of training, consultancy, project management and environmental management solutions. These provide the customer with a fully managed service through a single point of

contact. Furthermore, the in-house expertise that MSIS provides results in reduced staffing costs and minimised liability and technical exposure through increased safety and efficiency to the client.

Reflecting on what it is that identifies MSIS as a trusted specialist service provider David says: "I think that the company's successful delivery of projects and health and safety record speak for themselves. Tank cleaning is something that is sometimes perceived as just cleaning, but it is actually one of the more high-risk jobs that can be carried out in the offshore environment. It

Below
David Skinner, managing director of MSIS

involves working in confined spaces that contain combined substances that could be dangerous. Preparation is key to a successful project; site visits and analysis are done beforehand to fully prepare for the job. Primarily it is our methodology and track record that differentiates us and we retain a high level of repeat business with our client base."

The highly regarded reputation of the MSIS brand has allowed the company to work with well-known industry clients including BP, Transocean, Talisman, Global Energy and BIS Salamis as well as several others. At present the company's operations are primarily focused on the clients operating in the North Sea and Norway, however MSIS is ready to meet these needs of its clients wherever the market is most active, as David explains: "I think the sustainability of investment in the UK oil and gas market is an important factor for us going forward. There is a high level of investment in the region up until 2015 and after that the market is a little more uncertain, however the North Sea will remain our key market and in addition we are already planning to address international opportunities to sustain our growing revenues."

Commenting on the company's current focus and position he concludes "We have done extremely well over the past two years, the company has grown and we have a plan in place to continue that growth. This is the result of significant capital investment last year and I think we are on the right track going forward." O&G

> Tank cleaning is something that is sometimes perceived as just cleaning, but it is actually one of the more high-risk jobs that can be carried out in the offshore environment

MSIS
msisgroup.com

Services
Environmental services and equipment

Grand designs

A world market leader in the design of large, complex offshore construction vessels, the Netherlands based Ulstein Sea of Solutions (USOS) has gained a strong reputation for finding innovative offshore ship designs within the oil and gas industry since its inception in 2001. Boasting a unique understanding of its client's needs, the company strives to provide operators, contractors and ship owners with new technological concepts and forward-thinking designs that are highly beneficial to upcoming market trends. Originally operating under the name Sea of Solutions, the Dutch company was incorporated under the Ulstein Group's umbrella in 2008; since then it has taken on its parent company's name and continued to grow through increased availability of expertise and technology.

Previously featured in *European Oil and Gas Magazine* in July 2012, Edwin van Leeuwen, general manager of Ulstein Sea of Solutions discusses the company's developments over the last 22 months: "There has been a great deal of activity as a number of our vessel designs that were previously under construction have now been delivered. These include a.o. two derrick lay vessels for SapuraKencana, recently delivered by COSCO shipyard, and two customised versions of the ULSTEIN SOC 5000 design: the deepwater construction vessel (DCV) Aegir for Heerema Marine Contractors and the pipelay heavy lift vessel 'Seven Borealis' for Subsea 7. A third, even larger, customised version of this design we developed for Petrofac; the Petrofac JSD 6000. The yard contract was signed in February 2014 with ZPMC shipyard in China."

Heerema Marine Contractors was awarded the KNVR Shipping Award in 2013 for the Aegir vessel, as it combined Heerema's operational expertise with USOS' design capabilities to create a state-of-the-art vessel that can operate worldwide on complex infrastructure and pipeline projects. Despite being built for deepwater operations, the vessel has the lifting capacity to also install fixed platforms in shallow waters. Following the Ship of the Year award nominated Seven Borealis, the first Ulstein SOC 5000 design to be developed and put into operation, the success of the Aegir led to recognition from the high end market and a contract with Petrofac for the JSD 6000 deepwater derrick lay vessel; a unique design that features J-Lay, S-Lay and heavy lift capabilities.

Having developed a solid reputation for its ability to turn visions into reality for customers, Ulstein Sea of Solutions' strategic move into the Ulstein Group has enabled it to access a wider range of technology and therefore offer its customers a broader portfolio of vessel designs, technology and knowledge.

"Last year also saw our first design with an ULSTEIN® X-BOW® being contracted for construction; a customised version of the ULSTEIN Deepwater Enabler for Sealion Shipping/Toisa Ltd at Hyundai Heavy Industries.

The merging of our knowledge with Ulstein's technology like the X-BOW has resulted in our first successful project in this specific part of the subsea construction vessel market," highlights Nick Wessels, marketing and sales manager at Ulstein Sea of Solutions.

Designed to deliver optimum efficiency and cost effectiveness, Toisa's multi-purpose offshore construction vessel (MOCV) will be able to operate globally on projects including ultra-deepwater installation, and construction and flex lay and topside construction support. Furthermore, it features heavy lift capabilities via an active heave compensated offshore crane rated at 900 tonnes SWL, up to 50 t/m2 deck strength, two moonpools and an ULSTEIN® X-BOW®. "It is a very capable vessel and the biggest X-BOW built so far. But we anticipate a few more similar vessel designs to follow from our office," says Edwin.

By employing a Ph.D. researcher the company has taken a critical look on ship design processes, resulting in a new design methodology, already applied to a number of projects. It is not only proving to be a more efficient way of working with clients, but is also offering clients an improved insight into decisions within ship design. This development has naturally led to an increase in complex and niche projects, such as the development of an Arctic drillship concept. Other projects are currently ongoing, but not yet made public.

Introduced to the market almost ten years ago, the revolutionary patented ULSTEIN® X-BOW® design immediately caught the attention of shipowners around the world; with a bow shape that minimises pitch/heave accelerations and speed loss, the design thus boosts fuel efficiency and reduces harmful emissions. Furthermore, it eradicates slamming and bow impact, which in turn lowers noise and vibration issues for crew onboard and increases safety through a soft entry in waves. "It is a nice design that has been recognised as trendsetting in the market and appreciated by clients for increased operability windows", says Edwin. "And of course this key feature is highly appreciated by the crew operating X-BOW vessels as well."

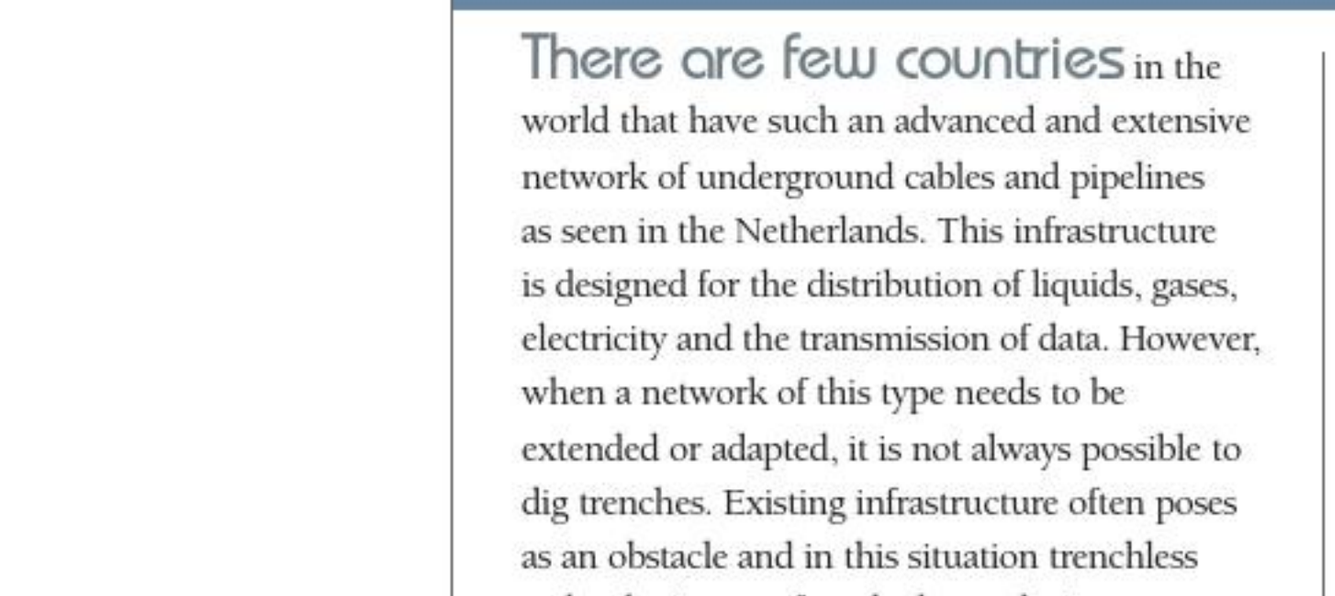
Having developed a strong reputation in the market for its high quality designs, Nick elaborates on the three key drivers of the company's success: "Creativity, flexibility and openness to innovation are our major strengths. Our best projects stem from close relationships with our client; if we get a contract we develop a design in close collaboration with our customer and offer flexibility towards their requirements. For example we could bring in technology partners on areas we feel additional knowledge is needed. Clients appreciate the freedom of choice they have when working with Ulstein Sea of Solutions when it comes to selection of their preferred mission and marine equipment, and where to build the vessel."

Looking ahead, the company's core values will hold it in good stead as it continues to move into new markets and take on niche projects, as Edwin concludes: "We have a number of projects that will be very interesting to the market, but we cannot discuss these right now. However, we have recently been awarded a design contract from Casco Offshore for a customised Ulstein Deepwater Enabler design; it is an accommodation vessel for 800 people using a mono-hull vessel instead of a semi-submersible solution offering cost attractiveness and increased levels of comfort. Our whole way of working is about finding new ways to optimise a ship's layout and design; by working together with our clients and technology partners, we can find these benefits and deliver them to the market." O&G

Clients appreciate the freedom of choice they have when working with Ulstein Sea of Solutions when it comes to selection of their preferred mission and marine equipment, and where to build the vessel

To boldly go

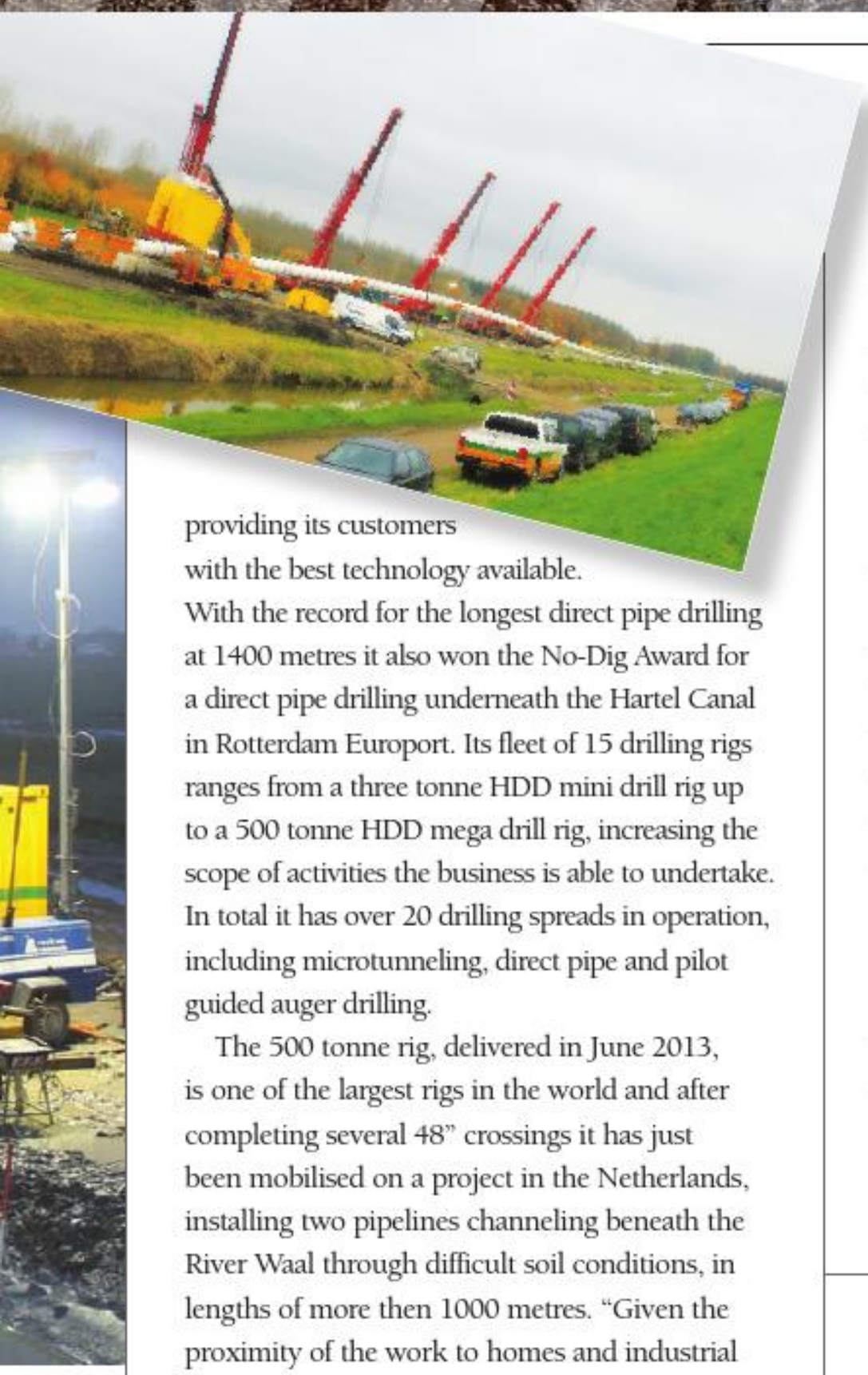
There are few countries in the world that have such an advanced and extensive network of underground cables and pipelines as seen in the Netherlands. This infrastructure is designed for the distribution of liquids, gases, electricity and the transmission of data. However, when a network of this type needs to be extended or adapted, it is not always possible to dig trenches. Existing infrastructure often poses as an obstacle and in this situation trenchless technologies are often the best solution.



A.Hak Drillcon executes directional drilling projects in the Netherlands, Europe, and the rest of the world. With a large number of technologies at its disposal, the business is recognised as a leader in trenchless technology. As a specialist in horizontal directional drilling (HDD) crossings, direct pipe drilling methods, micro tunneling, and auger drilling, typical applications include pipelines for gas, oil, kerosene, heat, drinking water and wastewater, medium and high voltage cables, telecom connections, pipeline tunnels, land accretions, culverts, siphons and drainage systems.

"During the last five years we have been very busy with large gas pipeline jobs in the Netherlands. As we draw to a conclusion on this period of work, we are looking further afield, at the moment undertaking projects in Germany, Belgium, Denmark, Hungary, Romania, Moldova, Saudi Arabia and Nigeria to name but a few," says Ronald van Krieken, managing director. The company is part of A.Hakpark, a family enterprise consisting of several subsidiary companies. Through the many years of experience working within a large group of businesses it understands the importance of close and efficient co-operation. "This is an advantage for us as well as the client. We can work as an independent drilling contractor, main contractor or sub-contractor, but importantly we offer our clients a total solution," he adds.

A.Hak Drillcon continues to invest heavily in state-of-the-art equipment as it focuses on



providing its customers with the best technology available.
With the record for the longest direct pipe drilling at 1400 metres it also won the No-Dig Award for a direct pipe drilling underneath the Hartel Canal in Rotterdam Europort. Its fleet of 15 drilling rigs ranges from a three tonne HDD mini drill rig up to a 500 tonne HDD mega drill rig, increasing the scope of activities the business is able to undertake. In total it has over 20 drilling spreads in operation, including microtunneling, direct pipe and pilot guided auger drilling.

The 500 tonne rig, delivered in June 2013, is one of the largest rigs in the world and after completing several 48" crossings it has just been mobilised on a project in the Netherlands, installing two pipelines channeling beneath the River Waal through difficult soil conditions, in lengths of more then 1000 metres. "Given the proximity of the work to homes and industrial properties in Nijmegen, the difficult project relies heavily on our skill and experience. We have a high standard for flexibility, quality and safety with a fleet of over 20 drilling rigs, each with a dedicated drilling crew. All our employees undertake annual training, and we work together with local universities and have established a custom-made management module. Additionally we have a team that works solely towards innovation, developing new technologies to serve the clients," explains Ronald.

For close to one year the business has worked on the development of a new drilling technique that will increase the possibilities of longer drilling in the future up to lengths over 3000 metres. With initial tests due in 2014 and 2015, launch to the market is set for 2016. In March 2014 the business also acquired a new 45 tonne HDD rig and a replacement 16 tonne unit. The robust design will be fully automated for small scale drilling tasks. In May 2013 it began another significant project, building a 60-kilometre high-pressure transport pipeline in the north west part of Holland. A total of 12 HDD 48" crossings were made with varying lengths of 800 to 1250 metres, and 12 microtunnels and one Direct Pipe crossing in the project, in which A.Hak Drillcon was responsible for the execution according to the high standard for safety and quality.

Under a partnership arrangement A.Hak Drillcon is currently undertaking a large micro-tunneling project in Germany, drilling pipelines three metres in diameter over 1500 metres in length.

The company continues to look for new opportunities, and recently set up drilling activities in Nigeria. Such an example is typical of where HDD methods are being considered instead of normal dredging, because there have been issues in the country with pipelines being damaged when people steal oil. HDD is undertaken at a depth of at least 15 metres so nobody can come into contact with the pipeline. Through a joint venture with a local partner, the company has two maxi-rigs working on oil and gas pipelines in the Niger Delta. As the company grounds itself in a good position in the international market Ronald concludes: "Europe remains our home and main market but we continue to explore opportunities in the Middle East and West Africa. The rest of the world needs the experience of western European companies."

> With the record for the longest direct pipe drilling at 1400 metres it also won the No-Dig Award for a direct pipe drilling underneath the Hartel Canal in Rotterdam Europort

A.Hak Drillcon BV
a-hakdrillcon.nl

Services
Design, engineering and construction of directional drilling

Proven provider

SapuraKencana Australia

is a fully owned Australian subsidiary of the Malaysian listed group SapuraKencana Petroleum Berhad, one of the world's largest integrated oil and gas services and solutions providers. SapuraKencana Petroleum Berhad's principal business includes providing end-to-end EPCI solutions and services to the upstream petroleum industry, and covers activities such as installation of offshore pipelines and structures, fabrication of offshore structures, accommodation and support vessels, drilling vessels, hook-up and commissioning, topside maintenance services, underwater services including saturation diving and offshore geotechnical and geophysical services.

Additionally the business has recently added a development and operating arm of oilfield production facilities. The group's global presence can be seen in over 20 countries ranging from Malaysia and China to Australia, Middle East, America, Brazil and beyond.

SapuraKencana Australia (formerly known as SapuraClough Offshore) is the result of the acquisition in 2011 by SapuraCrest Petroleum Berhad (which later became SapuraKencana Petroleum Berhad after merging with Kencana Petroleum Berhad) of the marine construction division of Clough (an engineering and project services contractor servicing the resource markets in Oceania).

SapuraKencana Australia's success is based on over three decades of delivering safe, innovative and cost effective SURF, platform, pipeline and well services solutions to clients throughout the Asia Pacific region. "We offer a range of offshore services and support our clients from concept and budget studies through to detailed design, fabrication, installation, commissioning and decommissioning," begins Guido Bressani, CEO. "Our fleet of leading edge marine assets and the state-of-the-art fully owned SapuraKencana Constructor, together with our world class project management systems, infrastructure, capability and execution experience has seen us build an enviable track record in delivering EPCI and T&I projects to the oil and gas community," he adds.

In past two years alone, the company has worked in Australia, Russia, Malaysia, Thailand and China with a suite of clients including Chevron, BHPB, PTTEP, Apache and Origin.

As Guido highlighted, the business owns and operates the SapuraKencana Constructor, a Norwegian built diving support and subsea construction vessel equipped with a 250 metric tonne, offshore rated, heave compensated crane, capable of deploying subsea structures in up to 2500 metres water depth. Outfitted with two 150 hp, 3000 metre water depth rated work class ROVs and a saturation dive support system, the 117m long vessel additionally has a helideck, moon pool and accommodation for 120 personnel.

"This is a versatile and state-of-the-art vessel with extremely good station keeping capabilities in all weather conditions which can be utilised for diver-less subsea construction and intervention activities, divers assisted installation works, light construction, inspection repair and maintenance works and light well intervention activities. The vessel has an approved Australian safety case covering subsea installation, accommodation/ hook-up and commissioning and light well intervention activities," explains Guido.

In 2010 SapuraKencana Australia was awarded, in joint venture with Seatrucks, the

AUSTRALIAN OFFSHORE SOLUTIONS

Australian Offshore Solutions (AOS) provides vessel management, marine manning and offshore support vessels. AOS has been supporting SapuraKencana with the ship management of their DP2 subsea support vessel "SapuraKencana Constructor" in its recent Australian campaigns and will continue ship management of the vessel on forthcoming projects internationally.

domestic-gas component of the Chevron-operated Gorgon project off the north-west coast of Western Australia. The project, which is approaching completion, entails the transportation and installation of a 90 kilometre pipeline connecting Barrow Island LNG facilities to the mainland tie-in point with the Dampier to Bunbury pipeline.

Of equal significance in its portfolio of work was the subsea installation contract for the Origin Otway Phase 3 development, completed in March 2013. Awarded the contract by Origin Energy Resource Ltd the scope of work involved the project management, installation engineering, procurement, fabrication, transportation, installation and pre-commissioning associated with the development of the Geographe discovery, located approximately 55 kilometres offshore Port Campbell, Victoria, in 90 metres of water depth.

The development entailed subsea architecture that included three structures, one tee protection frame, four sets of rock bolts, two diving spools, three diver-less spools, two umbilical, one flexible flowline, four hydraulic flying leads, 13 electrical flying leads and two pipeline corrosion monitoring cables.

In April 2013 SapuraKencana Australia was contracted by BHP Billiton for the subsea installation of the Pyrenees Expansion Project. The Pyrenees development is located in the BHP Billiton operated Permit Area WA-42-L off the coast of Western Australia. "The scope of work consisted of load out, transportation, installation and pre-commissioning of subsea structures for the Upper Pyrenees and Moondyne tiebacks to the Pyrenees FPSO in 215 metres of water depth and included all the associated project management, procurement and engineering activities," Guido highlights. The SapuraKencana Constructor was the main vessel utilised for both projects.

Reviewing the market, Guido says: "Whilst the Asia Pacific region is still predicting an increase in offshore oil and gas capital expenditure by operators for new developments, with a move towards deeper water, Australia is seeing a decline in activities compared to the unprecedented volumes generated by the concurrent development of three major conventional LNG projects, namely Gorgon, Wheatstone and Ichthys. Additionally resource projects in Australia are estimated to be 40 per cent more expensive than in the US with wages for some trades in the industry that have doubled in the past six years. These labour costs combined with low productivity are some of the challenges facing the industry at present and preventing further big mega project type investment in offshore oil and gas in Australia moving forwards."

As the business moves into the latter quarters of 2014 it looks towards future geographical expansion in China, Sakhalin, Indonesia and in Malaysia leveraging on the position of its parent company SapuraKencana Petroleum Berhad. "In addition we are considering a diversification toward the Opex sector as opposed to Capex, a market with a lower risk profile and which requires remarkably higher volumes to return same profitability compared to the higher risk and reward of delivering lump sum Capex jobs," says Guido. Over the last few years Australia has significantly increased its subsea infrastructure assets, which will require maintenance and will cause a significant increase in Opex expenditure from all the major Australian operators.

As an additional element of diversification, the business has formed a joint venture with its sister company TMT, trading as SapuraKencana Well Services (SKWS), which provides light well intervention (LWI) services for the subsea oil and gas industry. "SKWS can cover the full life cycle of the field, from FEED study to installation, maintenance, abandonment and full decommissioning of subsea production facilities. We can perform riserless light well intervention (RLWI) and subsea well abandonment with the RLWI technology which enables work to be performed on subsea wells from smaller vessels, without the use of a conventional and more expensive drill rig," explains Guido. OEG

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Lighting the way

Since the company was founded in 1997, Osiris Projects has earned an acclaimed reputation as a professional and reliable solution provider in a broad scope of survey operations. Osiris Projects was founded by directors Andy McLeay and Jim Walters, who each brought with them several years of experience of operating within geotechnical and other survey areas. Today the company is owned by the Bibby Line Group, which acquired Osiris Projects during 2012. Bibby Line Group has existed as an independent, family run business for over 200 years and has grown from operating within its traditional market of vessel ownership, management and operation into a dynamic group of companies that operates within shipping, marine services, logistics, financial services, offshore services and retailing. Having successfully navigated through demanding markets and the challenges of diversification into new areas, Bibby has developed the reputation for integrity, responsiveness and respect that defines the company today. It is these shared values coupled with a proven track record of expertise and excellence that allows Osiris Projects to act as a wholly owned, but self-managed part of the Bibby Line Group.

Today Osiris Projects provides turnkey survey solutions throughout the UK and European waters. Its services are typically applied to six main areas comprised of the oil and gas industry, renewables, marine aggregates, subsea cable, hydrographic and utilities markets. Within these areas the company's extensive services include but are not limited to acoustic cable and pipeline inspection, acoustic ground discrimination systems (AGDS), bathymetric survey, benthic and environmental sampling services, cable route survey, data processing and reporting, debris clearance survey, geotechnical sampling, oceanography and metocean services, ROV and AUV services and topographic survey.

Osiris Projects is currently in the final stages of an expansive cable survey operation for the Highlands and Islands project, which is designed to deliver fast, fibre optic broadband to the region. During March 2013, BT were awarded a contract by Highlands and Islands Enterprise (HIE) to execute a project to deliver fibre optic broadband to around 84 per cent of homes and businesses by 2016. As leading specialists in the coastal environment around the UK, Osiris Projects has exceptional knowledge of the challenging environments encountered by the project. As such the company was appointed to carry out detailed seabed mapping along all of the potential cable routes, which is critical to determine route development and cable installations. "This was a huge project," says Marketing Manager Cate Oake. "We have

undertaken a 20-route cable survey, which is essentially 20 jobs in one and we are currently in the final stages of completing that."

The success of Osiris Projects is based on its ability to deliver first-class solutions in the broad portfolio of services that it has on hand. To ensure that it is best able to service its clients the company has continuously invested in its knowledge base, equipment and training to bring all of the required components for survey operations in-house as Cate explains: "One of the company's founders, Jim Walters has a background in geotechnical work and it is something that we have always undertaken.

Previously it was always carried out with hired equipment until the decision was taken last year to purchase the equipment and bring the service in house. We have established a specialist department run by the Geotechnical Manager and three Geotechnical Engineers."

Osiris Projects purchased two specialist pieces of kit. The Geo-Corer 6000 high performance electric Vibrocore is a system that can operate in 3m, 4m or 6m configuration and has a weight in air of approximately 1000kg. It can be deployed from a wide range of platforms and Osiris has undertaken a range of improvements to offer a unique system to the market. These include simple deployment stability features, overhauling lifting configuration and a cantilevered recovery option.

The Datem 5000 CPT was added to the Osiris Portfolio during 2014 as part of the continued development of its geotechnical capability. Prior to purchasing the Datem 5000 unit, Osiris had previously used both the Datem 5000 and the smaller 3000 system for numerous projects around the UK. The cone penetration system includes a 5cm² digital smartcone and delivers 70Mpa/70kn push capability and penetration capability of up to 20m. Furthermore the system incorporates several features that allow for simple and efficient operation including an easily deployed compact sub-sea frame, real time control and display, single coax connection for power and data, low maintenance and low consumable use and easy to operate Windows based PC control.

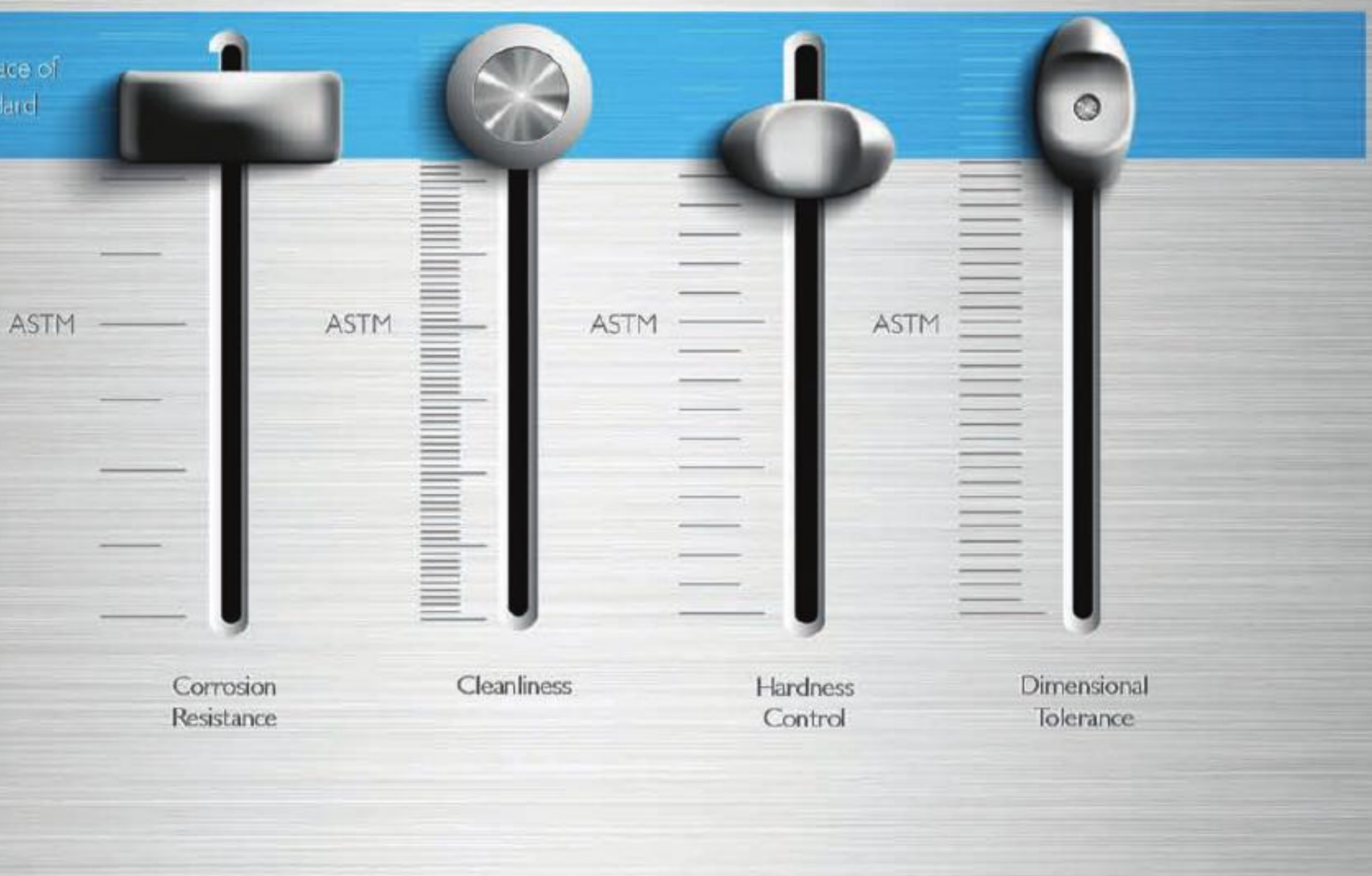
Osiris Projects manages its services through the operation of both chartered and owned vessels. This enables the company to service its clients effectively and to continue on its future strategy of growth into new markets. For example, during January 2014 Osiris secured a long-term charter of the MV Neptune from Neptune EHF. The 50 metre, DP1 multi-purpose survey vessel will allow Osiris Projects to conduct operations in deeper waters and increase its presence in the European market. The company is expecting the delivery of the Bibby Athena during winter 2014, which is currently under construction by specialist French shipbuilder Socarenam in Boulogne. The vessel will mirror the capabilities of Bibby Tethra, which was built in 2011 with a few subtle changes to reflect the company's development into shallow geotechnical sampling and more challenging offshore market. Osiris Projects managing director Andy McLeay says: "Placing the order for a twin sister vessel to Bibby Tethra is quite a milestone in the history of the company as it acknowledges the great success achieved with the original concept of providing the 'ultimate' coastal survey vessel. The second vessel will build upon the success of Bibby Tethra and allow us to offer greater availability of this remarkably capable multi-role survey platform."

DATEM

Datem is a leading high technology engineering company supporting the global offshore geotechnical market. It was natural for Osiris team members to continue their longstanding good working relationship with Datem by purchasing a new Neptune 5000 CPT System. The reliability and global popularity of its Neptune range of CPTs and associated products is a testament to the skills of Datem's highly motivated and professionally qualified engineers, providing high quality concept development, design, manufacture and servicing.

Osiris Projects
osirisprojects.co.uk

Services
Seabed mapping
and coastal surveys



Setting a higher standard within the standard

How reliable is your hydraulic and instrumentation tubing? Are you getting consistent quality from batch to batch? Superior corrosion resistance? Do you get excellent hardness control and close dimensional tolerances?

Let's face it, in the world of seamless tube, there are standards and there are *standards*. Just because a tube is certified to an ASTM standard does not automatically make it the right choice for your needs. Changes in the mix of nickel, chrome or molybdenum – within the standard – can make a huge difference in terms of product reliability and consistency. Fortunately, Sandvik tubes are always at the top of the standard. It's how we've been bringing peace of mind to our customers for more than 150 years. So if you're looking for the highest standards in terms of safe, reliable operations, contact your local Sandvik specialist today to find out how we can bring YOU some peace of mind.

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Leading the field

EMERSON/ TESCOM

TESCOM, a member of Proserv's Partner Sales Program, delivers a wide range of standard and custom engineered regulators, valves and systems for a diverse world market. You can count on expert application and customer support ranging from high tech complex projects to simple industrial applications. Close collaboration between worldwide design and manufacturing groups ensures the usage of state-of-the-art production technologies to provide the innovation and highest quality product that TESCOM customers have come to expect.

Proserv is a leading production technology and service provider to the global energy industry with unique offerings in the marine, subsea, drilling and production domains. Proserv has a large global footprint employing around 2200 people in 31 operating centres based in 11 countries. "Proserv is celebrating its 40th year globally this year," says Sam Norris, general manager for Proserv Middle East, highlighting 2014's significance for Proserv. "We have three manufacturing/service facilities in the Middle East: our Centre of Excellence and HQ for MENA is located in Dubai; and we also have offices and a service centre in Abu Dhabi. On the 19th of May 2014 we officially opened our New Service and manufacturing facility in Doha, Qatar. We now have a total of 14,500 sqm across our three manufacturing/service facilities in the Middle East."

It is around one year since Proserv Middle East last featured in *European Oil and gas Magazine*, and since that time the business has continued to grow in a buoyant market for oil and gas. At the end of 2013 the company was awarded the prestigious Technology Implementation of the Year Award at the Oil and Gas Middle East awards, recognising the innovative nature of Proserv's operations.

"We won this award in 2013 for developing the Energy Efficient Chemical Injection System with environmentally friendly features," Sam explains. "It meant a lot to us, really demonstrating our engineering expertise and our ability to innovate. It involved some radical thinking and true supply chain collaboration with Bifold Fluidpower to get this product to market.

"The system itself uses 40 per cent less energy than other conventional methods available on the market operating within the same parameters. It also has integrated remote GSM technology, giving the end users some very effective benefits, such as reduced electrical load requirement, without compromising on the design. The number of compartments and leakage paths has also been reduced to minimise the potential for operational failure. The overall solar system design has been reduced from 190 peak watts to 50 peak watts, without compromising the functionality.

"The Green skid also has GSM technology that sends a critical message by SMS to the operator/service technician when the tank chemical level is low, the pump trips, or other limits are breeched."

Innovation and engineering expertise are a key aspect of Proserv Middle East's success, and alongside the Energy Efficient Chemical Injection System, the business has also developed an energy efficient wellhead control panel. "These have been developed specifically with clients in mind," Sam highlights. "Our core clients based in the MENA region have the fortune of solar energy, but also the challenge of single wells spread across a vast landscape. We applied our 'ingenious simplicity' motto to the opportunity and designed and developed

independently powered solar units with bilateral remote monitoring and control through a GSM network. This has taken off with great interest among clients in MENA and now beyond to West Africa and Australia."

As well as this the business has developed a smart PLC based pressure test system that can be used for hydro-testing subsea trees, tools, casings, valves and other equipment. The system works by pre-programming volume, test pressure and test duration, and will automate the process to fill, test, vent and drain the unit being tested. For clients this brings added efficiency during testing processes, and allows the production of test charts that can be logged for traceability.

Last year Proserv successfully achieved accreditation on ASME U&R stamping, ATEX, and CE Marking, providing the company with the ability to work on developing new products to complement its existing capabilities, and using its expertise to help its clients overcome technical and supply chain challenges.

"Proserv has long held a reputation of being client minded, delivering engineering solutions to our customers, often in challenging and complex environments," Sam says. "As a service focused company, we are here for our clients. To give an example of this, we deployed service technicians into Iraq in 2013 at short notice to help the end user start up production and get first oil. Our team stepped up and spent over six months working with the client to install, hook-up and commission our competitor's equipment when they were unwilling.

"We have a lot of engineering expertise and technology available within the organisation and the products we engineer and deliver are of the highest standard and build quality," he continues. "Our product range exceeds that of our competitors. It allows us to offer complementary product and services and package work-scopes to offer more value to the client. We have built core engineering and project management experience, stable supply chain and lean manufacturing in the Middle East and around the globe, giving us greater leverage in supply chain but also sufficient capacity in and outside of the region if we need it."

In this, its 22nd year in the Middle East, Proserv Middle East clearly remains in a highly reputable position in the market. Naturally, the business is looking to continue to expand on this success. "We were awarded Proserv's biggest order in Kuwait, with 180 chemical injection systems being delivered and commissioned through 2014 and in 2015 we will extend our manufacturing capability into Saudi Arabia and Oman, committing in-country value to our clients and end users in these countries," Sam points out.

"In 2014 we will be focusing on delivering our commitments to our clients. We will be expanding our service team and reach with assignments in Algeria, Egypt, Kuwait and Iraq. Construction work is underway with some of our agents to give us more manufacturing capacity and in Q1-2015 we will go live with capability in Saudi Arabia and Oman, offering both in country value and local services.

"In Dubai we are launching our Monitored Professional Development Scheme for our Engineers and Technicians. This programme has been developed by our learning and development team in the UK and is accredited by the IMechE. This gives our engineering team the opportunity for further professional development and our technicians a route through to the challenging world of engineering. We want people to know they join Proserv not just for a job, but for a career," he concludes. OGG

SANDVIK MATERIALS TECHNOLOGY

Sandvik Materials Technology is a world-leading developer and manufacturer of products in advanced stainless steels and special alloys for the most demanding environments.
Its UK site is part of the global Sandvik manufacturing Group, where it is able to supply a wide range of stainless steel products, including tube; hydraulic & instrumentation, heat exchanger, boiler, high precision, & high temperature, pipe; seamless & welded, fittings & flanges, solid bar, billet and hollow bar.
It supplies material in austenitic grades: 304/L and 316/L and majority of products in duplex grades Sandvik SAF2205, Super Duplex Sandvik SAF2507 and Sandvik 254 SMO* (UNS31254).
Sandvik Materials Technology is very pleased to be working with Proserv, and supplying hydraulic & instrumentation tube to their projects in the UK and Middle East. Working together with Proserv, its products and services assist their productivity, process reliability and cost efficiency. It is Sandvik Materials Technology's aim to help its customers fulfil and even exceed their productivity and performance targets.

Powerful solutions

In late 2010 Dolphin Geophysical was established, embarking on a path to become a high-end first-class marine seismic service company. "We have stuck rigidly to that goal, ultimately leading to our success," begins Peter Hooper, COO. "We had a very focussed and aggressive business plan to build a fleet of eight vessels. With seven currently in operation we have the last planned new-build, the 22 streamer Polar Empress, due to be delivered in March 2015. It is a credit to our technical department and contracted ship owners to have been able to consistently construct and deliver these vessels on time. The success of the business plan relies on controlled expansion, and attention to detail. In Q2 2014 the launching of two vessels simultaneously, the 16 streamer vessel "Sanco Sword" in Norway and the 16 streamer vessel "Polar Marquis" in Singapore, was a significant achievement," he adds.

Today the business holds a respected and firm market position based on solid performance. Many of its clients return with repeat business, such as Shell and TGS, with 2014 marking the third year of delivering services to these two key customers worldwide. Globally, Dolphin's growing customer base is incorporating a greater number of major oil companies and NOC's, whilst also developing strong relationships with smaller cap exploration company customers, building on its reputation for being able to deliver powerful solutions.

"We have the capacity to deliver exactly what the customer needs, often in challenging frontier areas of operation, utilising efficient and extremely powerful vessels. Further to the developments in towed acquisition techniques such as Dolphin's SHarp combined acquisition and processing broadband seismic product, we also own our own processing software," highlights Peter. Following the purchase in 2012 of the seismic processing software company Open Geophysical Inc, developer of OpenCPS, land and marine seismic processing software, Dolphin has continued to build on the infrastructure of the software developed by Open for approximately four years prior to the acquisition, which includes a modern graphical user interface, and a modern data flow that naturally incorporates parallel processing. This is completely unlike older systems that were often initially written in the 1970's or 1980's and have had GUI's and parallel architectures bolted on top of the original code. What's more, it is fully interactive for parameter testing while also allowing batch processing.

Below
Peter Hooper,
COO Dolphin Geophysical

"Since purchasing Open, we've helped to build up the geophysical applications significantly and now have a full suite of tools for time processing and imaging," he explains. "2014 is another growth year, marked by exciting developments such as the launch of our depth imaging software and services.

"At Dolphin we believe we have a competitive advantage in that we use exactly the same software on all vessels and in all of our offices. It is the same GUI all the way from real-time QC on the boats, through fast track processing, interactive testing and analysis, time imaging and finally depth model building and imaging. This allows more flexible movement of staff between vessels or offices and at the same time allows office-based geophysicists to develop their processing skills by working on both time and depth imaging projects.

"Not only do we generate work from our own vessels, producing fast-track products offshore, and further processing the data at our onshore processing centres, but also marketing available onshore processing capacity to process existing third party data sets at Dolphin's processing centres in the UK and Singapore, with plans to expand in the NSA Region," he adds.

Operationally active in Australia, the North Sea, East Africa, Central America and Asia, in July 2014 the business is opening up a new and larger processing centre in Singapore from where all its Asia Pacific operations are managed. "We continue building up a presence in Asia as we increase our volume of offshore operations and our onshore processing capacity. We have also expanded our Houston office considerably in the last two years as we target operations in Central and South America, with Andy Phipps recently joining the Dolphin team, and leading our future NSA growth as President of the Western Hemisphere," explains Peter.

A portion of the fleet has been active in Brazil over the past 12 months conducting a large 3D multi-client survey in partnership with TGS. With contracts in the NSA region due to commence with both Shell and Repsol, 2014 remains a very active year as Peter comments: "Having nearly completed the "vessel build" phase of our business plan, we have continued to solidify our global position with clients and have started to see the rewards from the last three years of hard work." That hard work has been particularly highlighted in the success and growing reputation of each individual vessel, demonstrated by a very strong backlog into Q4 of 2014.

"No matter how well a job is conducted, we are ultimately unable to control the global market. There was a dip in Q4 of 2013 experienced by Dolphin and several of our competitors, which prompted us to strengthen our global push so that we are not reliant on one market region, and less seasonally exposed. By increasing our fleet size we have in turn been able to generate more flexibility, resulting in greater efficiency and utilisation. The uniform combined large streamer count and power of our high-end vessels also makes for efficient fleet planning," says Peter.

With its flexible and customer orientated focus, Dolphin remains an open organisation that focuses on careful planning to achieve its goals, as Peter points out: "Through common project planning with customers, we are fully aligned with our clients when it comes to de-risking their project operations and their survey. A lot of the places in which we work are very environmentally challenging, remote, frontier areas, or have other challenges such as complex field operations in more developed areas, and our clients recognise that through the Dolphin organisation they get access to the right people when they need them, so questions can be quickly answered and operational

We have the capacity to deliver exactly what the customer needs, often in challenging frontier areas of operation, utilising efficient and extremely powerful vessels

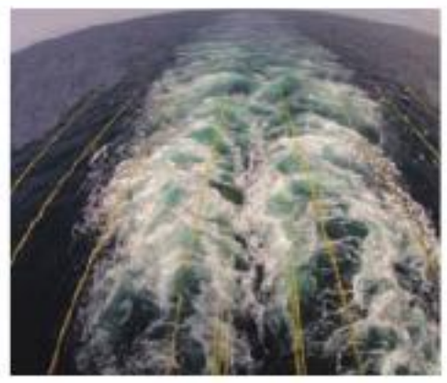
risk managed through good planning. The business recently received its ISO 9001:2008 accreditation, Dolphin's QHSE department leads the push to achieve a major corporate target of documented continuous improvement- formalising processes, records, and risk management within a living management system utilised by the offshore crews and staff at all worksites. We also give our clients full access to senior management. We are a dynamic company delivering a high quality service."

As the business continues to expand, it employs a large amount of new talent into the industry, both from universities and other industries. Within the business Dolphin provides an internal training programme, customising knowledge to allow new-hires to rapidly contribute to the company's performance. Equally, as it has acquired businesses it has recognised the skill within those companies and incorporated those individuals into its evolving structure as Peter indicates: "We are not a start up company anymore, and with global growth we have adjusted our structure to ensure the business is managed effectively by motivated employees, delivering a high quality of service, no matter where we operate in the world."

Over the next 12 months, in line with the business plan, global expansion and global revenues are targeted. "We have seen been exponential growth since 2010, and revenue targets next year are significantly over $400 million. Our vessels are designed to meet the future needs of the seismic industry, and as clients request wider and larger configurations, Dolphin delivers reliable services, through one of the best fleets in the marketplace."

At the time of writing Dolphin's heavily pre-finded Gotha Multi-Client survey in the Barents Sea is making excellent progress. The data is currently being acquired using Dolphin's proprietary SHarp broadband acquisition technology and processed in Dolphin's UK processing center, using Dolphin's OpenCPS software platform. The data shall be available to clients in time for upcoming APA 2014 and 23rd acreage Rounds.

"This is an excellent illustration of the fact that Dolphin has become a mature company, with the ability to innovate and compete in all segments of our industry. With our focus on powerful solutions, the key for us is to open up new market areas utilising this powerful and modern fleet and high service levels. Although we have almost completed building the fleet, we continue to build and strengthen the company, and as such look for new opportunities. The market place looks quite healthy as we go forwards with a healthy supply and demand balance expected. Through keeping in touch with the market and having the correct team in place Dolphin's future is strong," Peter concludes.



ULMATEC BARO AS

The reliability and stability of the deflectors are vital for successful operation in the high-end market. Dolphin vessels are equipped with Barovanes from Ulmatec Baro, the latest ones with the Barovane 412 – the most powerful 'vane available on the market today.

Moving technology

PLATAL MOBILSYSTEME

Platal Mobilsysteme is a competent partner for individual customer container solutions in the field of in-housing technical equipment, even in difficult climate and environmental conditions. High quality and short delivery times are reasons for the long relationship between Geo Data and Platal. The factory, located in the middle of Germany, is a specialist for individual trailer and tank constructions to insert at oil and gas fields. All Platal products are constructed and produced in Germany.

For several decades the Fangmann Group has operated as a highly skilled service provider across a number of industry sectors. Today the group manages three operating companies that provide targeted services to the clearly defined markets. These are comprised of: Fangmann Energy Services, which has operated since 1956 and manages design, preparation and jobs performance, as well as analysis of stimulation and cementing jobs in crude oil, natural gas, geothermal and underground storage wells; Fangmann Industrie, which specialises in superior technical projects and Fangmann Automation, which supplies future-oriented solutions within measurement and control systems. Fangmann Automation has operated since 1992 and offers a full service package comprised of project management, planning, engineering, assembly and start-up as well as professional maintenance and repair of plants and systems.

Since the Fangmann Group was last featured in *European Oil and Gas Magazine* it has continued to grow and build on its reputation for undertaking technically demanding and ambitious projects. The success of the company can be marked by its continued growth between 2010 and the present day, which has seen its workforce grow steadily from around 170 to more than 200 highly qualified and motivated employees. This dedicated team allows the company to offer optimal solutions to its clients' most complex tasks.

Within the oil and gas market the Fangmann Group focuses primarily on four areas: stimulation and cementing services, mechanical engineering, electrical engineering and finally transport and mobile crane services. A more detailed look at the projects undertaken by the company in recent years reveals cementing works in oil, gas and geothermal wells; acidizing in wells, pumping serivcs, foam/acid batching in gas wells, dewatering of gas wells and the execution of acidizing/surfactant/diesel emulsion stimulation campaigns in oil fields. These operations have seen the Fangmann Group work with respected industry clients including Exxon, GDF SUEZ, Wintershall, RWE Dea, Shell and UGS, to name just a few.

A recent development from Fangmann was the unveiling of its mobile flow back equipment for gas wells (MFE) during 2014. Treatment work involving natural gas has several requirements relating to industrial safety and to

the protection of the environment. Equally it is important for operators to ensure that works are undertaken efficiently and effectively to limit production costs and keep projects within budget. In developing the MFE, Fangmann considered all of these factors to deliver a solution that would best match the concerns of performance and safety.

The final design of the MFE resulted in a system that is able to operate with a maximum flow rate of 10,000 NM3/h with an input pressure reaching maxX.345 bar and an amount of water equal to 5000 l/h. The MFE is housed within five mobile skids each containing either a hydraulically hinged torch/flare plant, gas filtering unit, gas separation unit with water separation and cleaning, storage tank or a mobile guidance centre (DATA Van) and workshop.

In terms of operation the MFE is designed to go in service once borehole treatments such as foamer batches and coil tubing have been utilised to remove fluids from the well without causing damage to the local environment. Once the MFE is operational, gas flaring ensures that pressure ratios remain nominal guaranteeing that further stresses to the environment are avoided and that the well remains productive.

Additionally the MFE is designed to facilitate rapid deployment and short preparation times, making the technology a cost-effective means of beginning production quickly and efficiently. Further components are designed to be simple to install and compatible with the MFE via an integrated derrick, allowing for rapid growth and development of the drill site. The MFE is further enhanced by the innovative introduction of a hydraulic folding and sealing mechanism, which allows the system to be dismantled and erected without the need of an additional crane despite encompassing a 20 metre gas flare. The result is a highly flexible and diverse system that is able to meet the changing needs of the field.

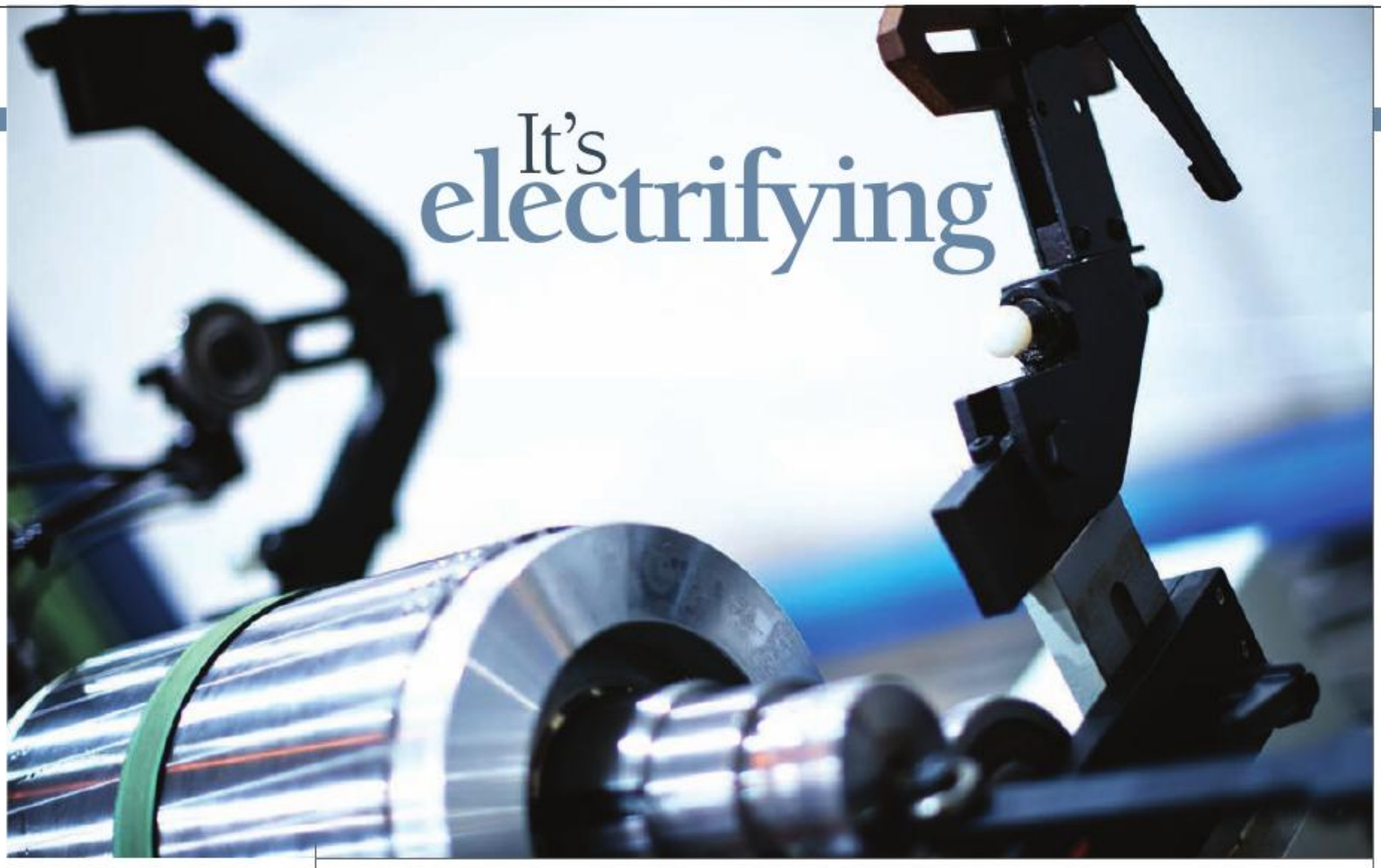
The MFE is highly automated with all of its substantial components equipped with pneumatic drives, which can be controlled from the Data Van once the plant has been started. This means that the entire operation is almost entirely controllable from the safety of the Data Van with entry into potentially hazardous areas only necessary for control and sampling purposes. This offers the opportunity for clients to reach new heights of operational safety and all equipment is designed and produced to meet with the most recent requirements of EU legislation.

With fully integrated packages like that of the MFE and turnkey drill-site service solutions, Fangmann is poised to offer market-leading solutions to the oil and gas market well into the future. The company is proud of its position as a small but nimble business that is able to respond quickly to the needs of its clients to offer targeted, bespoke oilfield services. OEG

> The MFE is further enhanced by the innovative introduction of a hydraulic folding and sealing mechanism, which allows the system to be dismantled and erected without the need of an additional crane

C-DEG ENVIRONMENTAL ENGINEERING GMBH

C-deg environmental engineering GmbH is a manufacturer of gas flares and combustion chambers headquartered in Kiel, Germany. C-deg flares are used around the world, primarily in environmental engineering and in the oil and gas industry. In 2012, Fangmann Industrie and C-deg agreed to jointly develop a mobile elevated flare. Initial design sketches from C-deg led to the mechanical implementation by Fangmann, while C-deg assumed responsibility for the engineering design of the burner and control processes.



It's electrifying

With over 100 years experience within winding, automation and power electrical installations IKM Elektro holds an enviably strong position in the subsea market. The business has developed a broad expertise within the area of subsea design and applications, concentrating on motors, transformers and HPU's. It currently delivers electrical subsea technology and topside applications as stand-alone or complete systems to the Norwegian market, and has plans to expand within the European and American markets.

Supported by a group that is positioned in 14 countries around the world, its head offices in Stavanger are the centre points for its operations. "Our business has developed and grown over the years and today we see ourselves as a total service provider for our customers in the oil and gas industry. Based on our understanding of motor technology, we offer a wide range of services connected closely to this. Subsea motor technology, condition monitoring services, delivery of motor winding and overhaul services, service personnel and electrical topside applications," says Øystein Stjern, managing director.

The business has developed both asynchronous and permanent magnet based motors for subsea applications, and in addition to associated control systems for these applications it also supplies motor drives. The newest product released by IKM Elektro is a safe earth cabinet, designed to make subsea earthing easy. Through delivering a wide range of topside applications for the offshore market it has a lot of experience with automation, electrical installation and electrical power distribution, which has provided a good base knowledge that helps deliver optimal designs for its customers, always seeking to find an electrical solution.

Over the last couple of years the company has delivered several subsea and topside combined systems for ROV, dredging and mud recovery applications. During the same period, the service department has significantly grown and holding competence in high value its personnel are regularly trained. In a very demanding and technology driven business the company maintains a focus on ensuring that the skill level of its employees is high, recognising the direct correlation between training and project performance.

"Within our workshops we employ apprentices, additionally taking on graduates as well as employing trained electricians. In 2009 we had 50 employees, but today we have over 90 and expect to reach 100 employees by the end of 2014. All of our service managers have more than 15 years experience each from handling service missions on the Norwegian shelf, and our personnel perform tasks with quality and precision. The three main values within the company are flexibility, competency and courage," explains Øystein.

Knowledge and technology are the fundamental strengths of the business, with its value of competence borne from these strengths and supported by a programme of follow up notifications to ensure that training is up-to-date and avoids lapses as Øystein highlights: "We have a minimum amount of training that needs to be completed by each employee every year. We bring high competency to the market and our customers value this. Our pricing strategy is highly important, but it is the delivery of quality products that has led to success."

With several ongoing contracts it works with companies within the group such as with IKM Cleandrill, currently on a subsea motor and topside power contract as well as external businesses such as Deep Ocean, National Oilwell Varco, and Deep C. Together with IKM Instrutek, one of its sister companies, IKM Elektro recently also finalised a total condition-monitoring concept. "We can provide motor overhauls up to 25 ton motors and we have state-of-the-art balancing equipment," Øystein points out. Supplying services for surveillance and monitoring it will perform maintenance and repairs for both offshore and onshore.

Recognised for the quality of its products within the subsea motor market the business has also written and undertaken a strategy selling to the European and American markets. "We know that manufacturing prices are likely to be higher than in these two market zones but we have a good product and great skill base," says Øystein. With a vision across the Atlantic, IKM Elektro will be targeting OTC Houston in 2015. Being part of a much larger group of companies it has access to a number of opportunities and collaboration options, as he adds: "Larger companies look to conduct business with us as we are represented by a large company with a good background. The group is multi-disciplined and we have our own businesses within steel manufacturing, machinery, engineering services, completion/comissioning and so on.

"The business is on a clear path, utilising our core competence. We are very aware of our strengths and where we want to be in the future." As it continues to grow, the company seeks to generate more value with further expansion in the subsea market complemented by expansion into new markets across the world such as electrical actuators and subsea connectors. "We are building the company around our fundamental knowledge of motor technology and the knowledge around subsea and topside electrical interfaces. We wish to be a leading supplier within our core technology and use our knowledge to expand markets, and we want to implement our strong research and design capabilities to achieve our goals," he concludes. OEG

NORATEL

The custom designed marine transformers and chokes are delivered by Noratel. The Norwegian transformer-specialist has Europe's most comprehensive range of dry transformers, and has gained extensive experience as a supplier to the offshore and marine industry. Noratel has actually produced transformers and wound components for almost 90 years!

IKM Elektro
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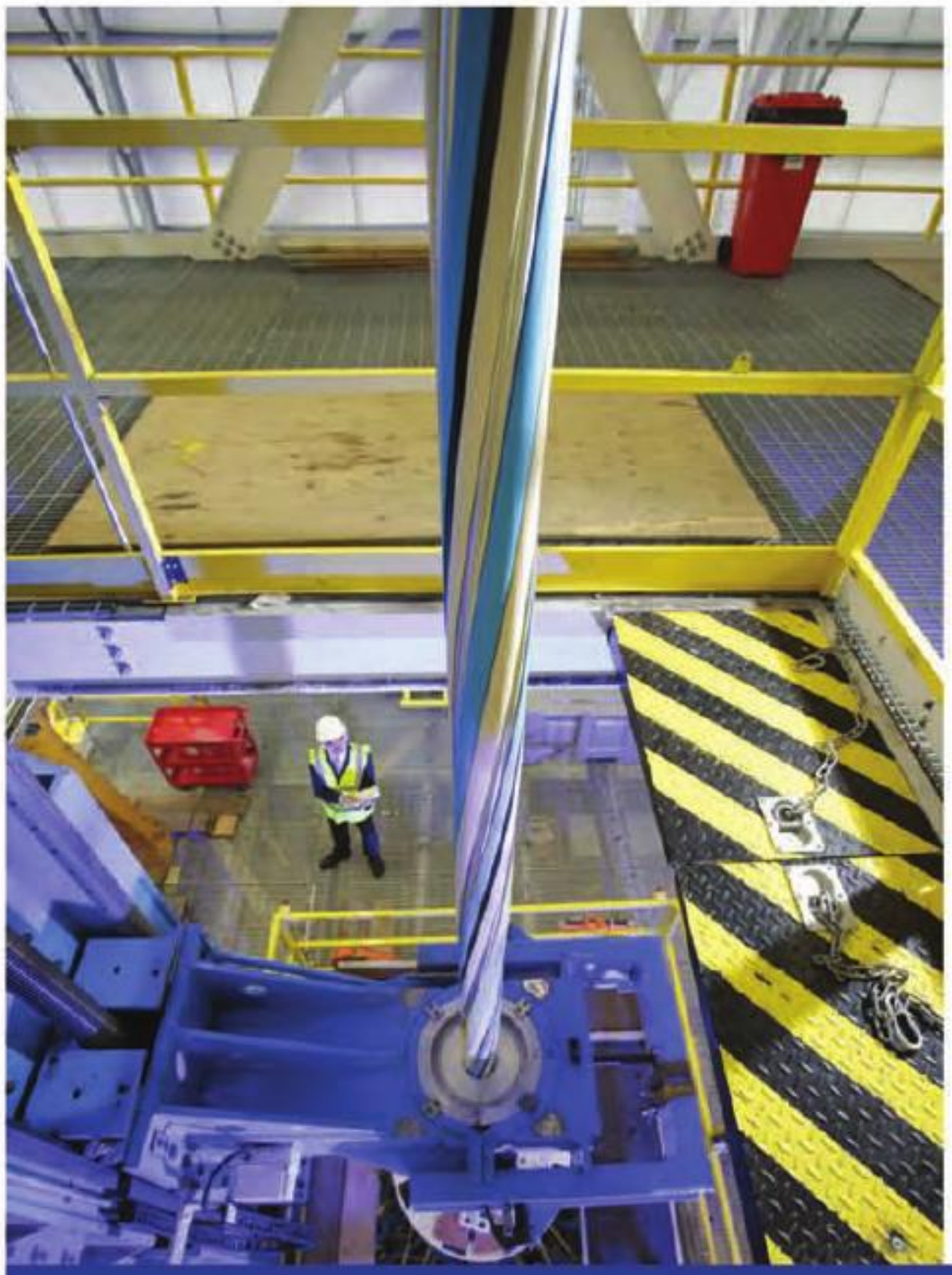
Services
Subsea technology and topside electrical applications



Technip Umbilicals

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- Designed to serve the future needs of the industry
- State of the art instrumentation and control system including intergrated steel tube welding station
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- Perfectly located in Newcastle upon Tyne adjacent to the River Tyne with direct deepwater access

www.technip.com

Technip

Technip Umbilicals has an extensive history that began more than 30 years ago. In that time the business has grown significantly to match the increasing demands of the oil and gas market. With manufacturing locations in the UK, US, Angola and Malaysia, the company's footprint positively supports its global position in the umbilical market.

Under the umbrella of Technip Umbilicals, this specialist division has a wealth of experience producing equipment for some of the world's most challenging environments.

"It all begins with research and development (R&D) in Newcastle," says Jean-Louis Rostaing, managing director. Employing more than 30 personnel in its R&D centre alone, the team is fully dedicated to being at the forefront of innovation in the industry and in May 2014 it officially opened a new steel tube umbilical assembly facility in Newcastle upon Tyne. Additionally, manufacturing facilities in Houston, Angola and Malaysia provide support to markets local to these locations.

"Following the same production methods globally, we are able to consolidate our production data and offer the best to our clients. Essentially this means that wherever in the world our clients have projects, we can select a suitable location to manufacture products to a guaranteed high standard," points out Jean-Louis. This collaborative effort ensures that the best practices are observed throughout the business.

Technip Umbilicals was recently awarded the umbilicals contract for the Kaombo project in Angola by Total. As the largest ever project to be received by the company, it represents a significant milestone, both in terms of the growth, but equally highlighting the trust in the business held by its customers.

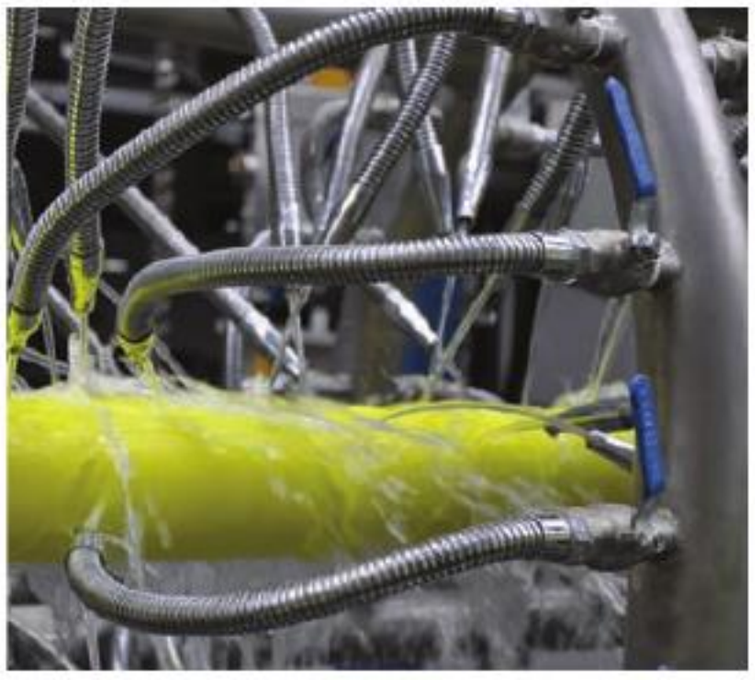
"All of the project management and engineering will be carried out in Newcastle, with sections of the umbilical manufacturing

being conducted in Angola. Our worldwide structure has been designed to cover the anticipated demand. However, we are happy to invest to get a firm footing in new locations, as demonstrated by our investment into Angola where we have increased the capability of the plant to be able to deliver umbilicals requiring carousels. We have also increased the capacity in Houston, where we are currently manufacturing a third carousel. We see that there is a real and

growing demand," Jean-Louis highlights.

Technology has for many years proved one of the business' strengths and regular investment of effort into the R&D and engineering departments has maintained this position. "We have established the best practices in terms of designing and manufacturing. There is a strong link between us and the rest of the Technip Group, particularly the R&D department, and this is always appreciated by the client," says Jean-Louis.

Many members of the team within Technip Umbilicals are group experts. With a broad knowledge the business is in a position to deal with any special requirements, even if unrelated to umbilical production. It also supports its customer base, providing a point of contact to offer advice and support on a number of technical matters. There is a strong team with a lot of experience, on average ten to 15 years, but importantly there is a good balance as Jean-Louis explains: "We have a lot of new and quality talent coming into the business, and it is



our culture of continuous improvement with no complacency that supports our growth.

"We work a lot with apprentices, regularly taking trainees onboard in new areas of the company. We also operate a graduate programme taking in recruits annually on programmes to be rotated around different departments throughout their first two years. People management is a strength that we hold as importantly as technology.

"Our third strength is found in our assets. Our new plant in Newcastle is one of our most important assets. The state-of-the-art manufacturing facility was part of the strategic plan. The R&D centre had a strong team but we felt that the infrastructure did not complement their efforts. The outcome is a facility with greatly improved working conditions, and a modern facility that we can show to our clients. It will also enable us to better embrace Technip's shared values of safety, quality and delivery of projects."

Operational since early 2014, the plant in Newcastle has already enjoyed a number of orders, awarded even before the facility was completely commissioned. The orders have come from major clients including Total.

"Globally we are enjoying a very good order book and we see a very active market. We are positive on the market and believe that the investment and focus we have put into the umbilical business will achieve the desired return.

"Technology, people and assets are the three fundamental strengths, but being part of the Technip Group is also shaping our future. When designing and manufacturing umbilicals it is important to take into account the installation process and that is an area in which Technip has vast experience. If we have specific needs, be it technology, resources or information, we are usually able to source this from within the group," concludes Jean-Louis. OSG

> When designing and manufacturing umbilicals it is important to take into account the installation process and that is an area in which Technip has vast experience

Neptune Energy Park

Newcastle upon Tyne

The Neptune Energy Park development on the North Bank of the River Tyne is now open and ready for business having been established to attract blue chip companies to invest in the region as well as creating a facility where project mobilisation and demobilisations can be completed alongside a drydock facility, that can be utilised for large civil construction projects and as a subsea equipment marine test facility.

The Neptune Energy Park operates in tandem to the services offered at the Offshore Technology Park both sites offer unique offshore and marine cargo handling terminal 365 days a year, with a world class reputation in service, cost effectiveness, efficiency and flexibility and over 30 years experience.

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Local industry in partnership with local government

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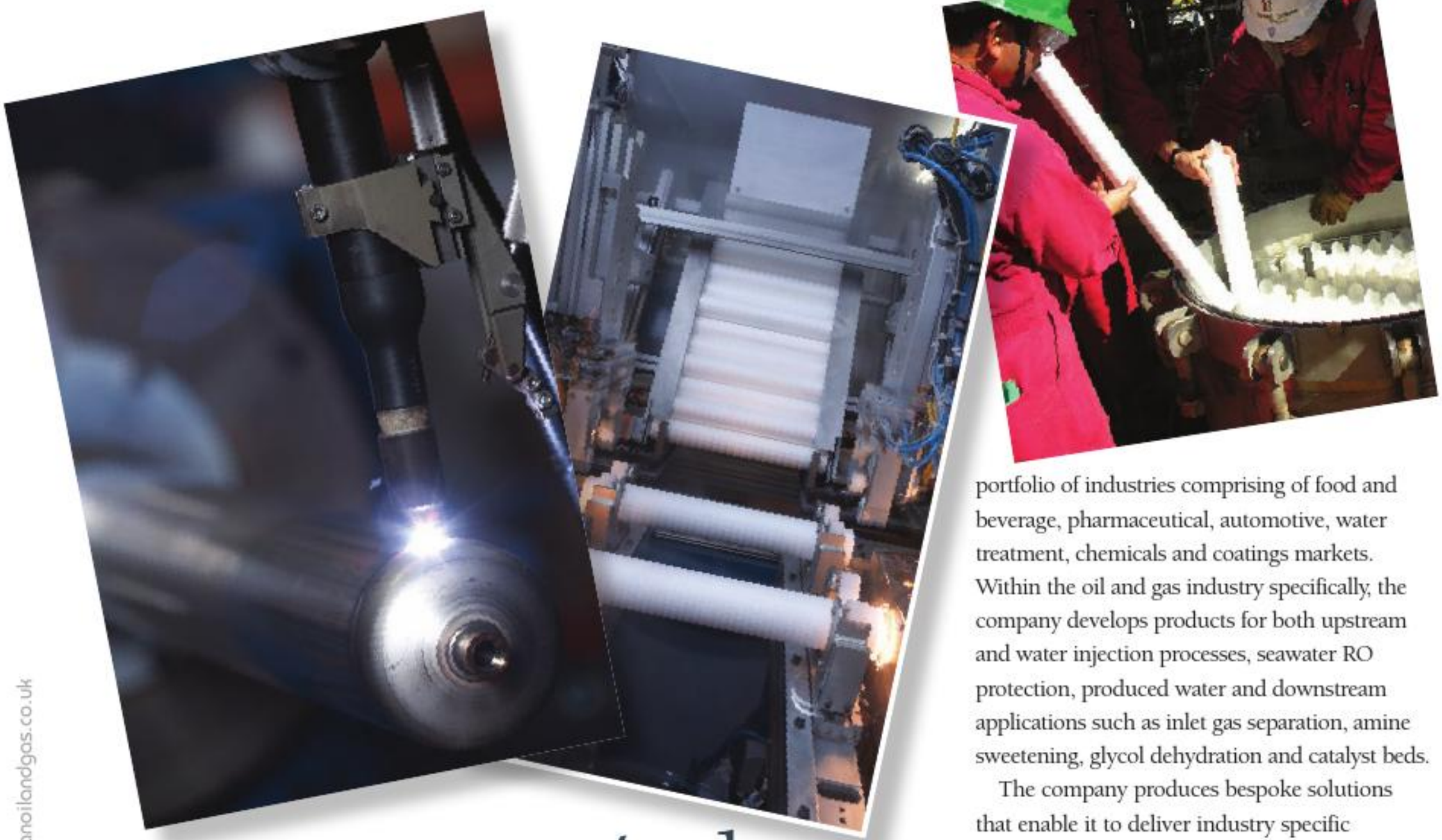


A clear solution

portfolio of industries comprising of food and beverage, pharmaceutical, automotive, water treatment, chemicals and coatings markets. Within the oil and gas industry specifically, the company develops products for both upstream and water injection processes, seawater RO protection, produced water and downstream applications such as inlet gas separation, amine sweetening, glycol dehydration and catalyst beds.

The company produces bespoke solutions that enable it to deliver industry specific products and solutions that are tailored to a client's exact needs. Its range of cartridge filters is comprised of both absolute and nominal rated solutions in either polypropylene or nylon media, while filter housings are typically of 316 stainless steel, Super Duplex or coated carbon steel construction. Furthermore, Amazon Filters is able to differentiate its products with enhanced features and comprehensive customer co-operation and after sales service. "I think our success comes from being both manufacturer and supplier and is further enhanced by our knowledge of our client's applications," says Jeff.

"We deliver the project manage as sold, meaning that what we agree and sign up to is what we stand by and deliver. We will 'handhold' the project throughout its execution and recognise the need for clarification up front on the project design and proposal stage. This makes the initial upfront work a little more challenging for us but in the long run the project runs much more smoothly for our clients."

Commenting on the unique features of Amazon Filters' range he says: "A key strength is the company's ability to engineer disposable cartridges to meet our customers' specific needs. By working closely with the client, testing the process fluids and understanding the real demands of the application a solution can be identified. To support this we also have our own design of easy to open, rapid opening closures for the larger filter vessel range used in the offshore market."

An example of just one of the many filters

FORSYTHS LTD

Forsyths Ltd provides engineering and fabrication services to the oil & gas, pharmaceutical and distilling industries. Its clean environment facility at Rothes and dockside facilities in Buckie are perfectly aligned to the needs of the oil & gas industry. Forsyths is proud to provide ASME U-Stamp National Board pressure vessels for Amazon Filters.

Established in 1985 in the Surrey town of Camberley, Amazon Filters is a specialist in the design and manufacture of liquid filtration systems, providing one of the widest selection of filter vessels, depth and pleated cartridge filters available today. Despite operating in a competitive market place with competitors selling out of the Far East and North America, the company has become a globally recognised force with a strong export market to clients all over the world, as sales director Jeff Kirby elaborates: "We export to just about every country in the world these days; we have just finished our financial year end and 67 per cent of our business was in exports. Primarily the company's main market is Europe for general exports, but within the oil and gas market its main areas are the North Sea, west coast Africa and Brazil."

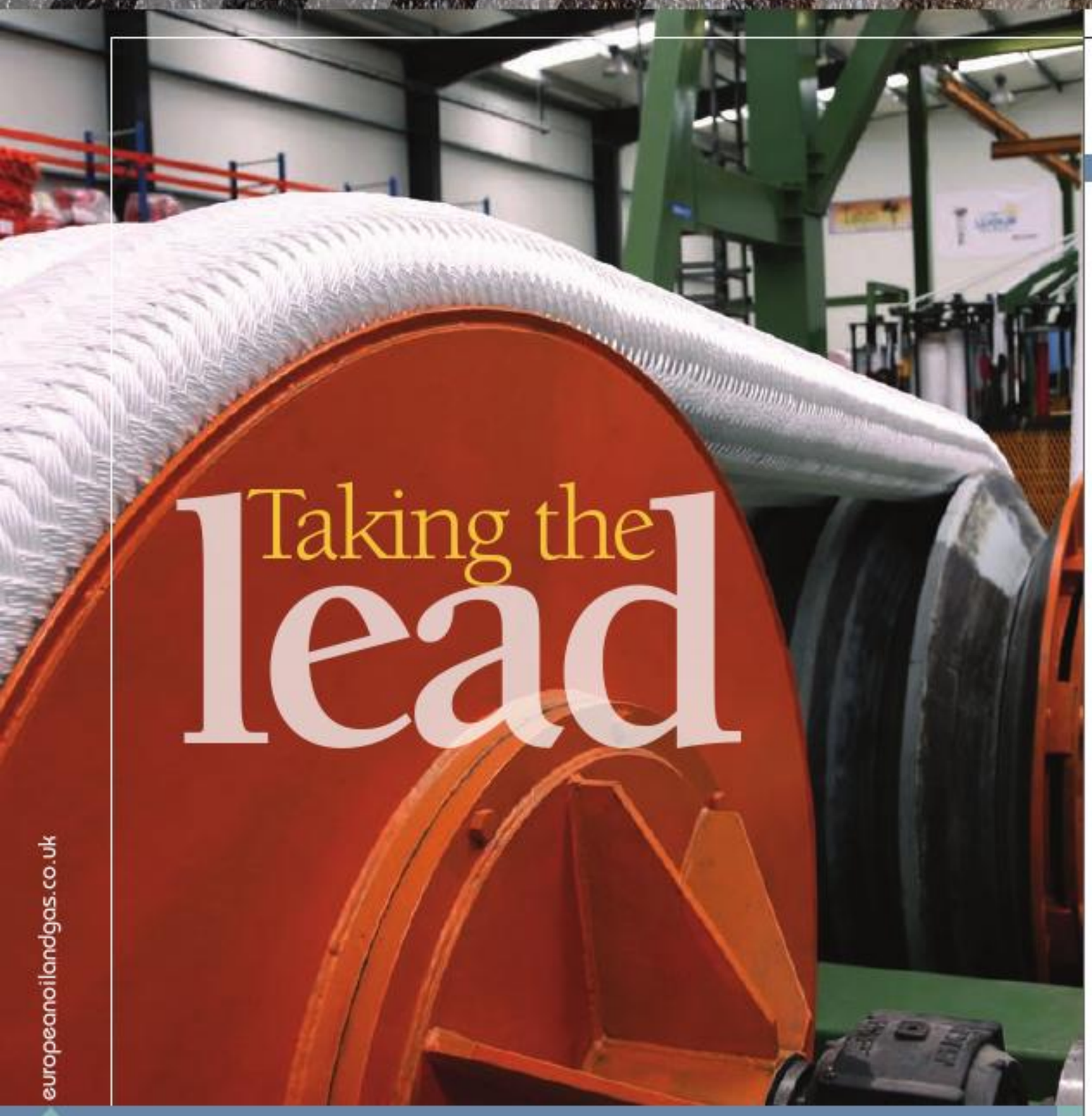
Although Amazon Filters maintains a strong presence within the oil and gas market, its products have applications within a diverse

offered by Amazon is the SupaSpun II absolute rated depth cartridge. SupaSpun II precision graded density filter elements are an extension of the company's already proven absolute rated depth type filter range. These high performance cartridges excel by exhibiting extremely low clean pressure losses as a result of strictly controlled manufacturing of the fibre matrix, this further results in a high dirt capacity. SupaSpun II fibres are blown continuously onto a central support core, with fibre diameters controlled to produce different pore sizes throughout the extrusion process. All the layers are inter-linked, offering maximum strength whilst ensuring that the high void volume is maintained, and with the increasing fibre density structured towards the cartridge central support core, it results in true depth filtration. Other products commonly employed within the oil and gas market are the SupaGard, SupaPleat II, SupaPleat FFC, Contour and VisClear cartridges as well as the company's DuoLine bags and SupaMesh metal filters.

In conjunction with first-class manufacturing quality and dedicated customer driven expertise, continual innovation into the company and its engineering staff are key components in what makes Amazon Filters a leading European filter manufacturer. The company runs its own graduate training scheme to ensure that it maintains the knowledge and skills base to meet the engineering challenges of tomorrow, while investing in its manufacturing facilities to drive further market growth and expansion. This year the company has opened additional floor space that has increased the manufacturing area available to Amazon Filters by 25 per cent. It is the dedication to its clients however that remains at the heart of the business and will be at the forefront of Amazon Filters' focus as it moves forward into the coming years, as Jeff concludes: "Customer service is everything these days, no matter how good the product or the price, our clients need more than just a simple priced based product. One can always buy cheaper, but customer service is of particular importance and is what differentiates Amazon Filters." O&G

Amazon Filters
amazonfilters.com

Services
Turnkey filtration equipment



Taking the lead

Above
Lankhorst Ropes' deepwater rope manufacture

Right
Lankhorst Ropes' cut resistant fibre ropes jacket development

Below
Lankhorst Ropes - reels being delivered to mooring installation vessel

As operators begin exploration and development of oil and gas fields in more demanding offshore environments, Lankhorst Ropes is taking a lead in the development of 'next generation' mooring systems, as Neil Schulz, sales director Deepwater Mooring - Lankhorst Ropes Offshore Division, explains in this article.

Drawing on its extensive research and testing facilities at WireCo WorldGroup's Global Synthetics Lankhorst Euronete R&D facility, the company is researching new mooring rope materials better suited to the engineering and practical challenges of mooring in ultra-deepwater and busy fishing areas.

Cut resistant mooring ropes

New field development opportunities in the North Atlantic Ocean and Norwegian Sea pose a significant challenge for naval architects. Mooring lines are subject to extreme weather and wave conditions. More concerning, however, is the risk of damage to the mooring lines from fishing trawler activities. Through mooring projects for ENI Norge's Goliat, and Statoil's Aasta Hansteen, Lankhorst Ropes has gained an unrivalled insight into production of cut resistant mooring ropes.

Using its in-house rope test machine, Lankhorst has been able to simulate the effect of trawler wires coming into contact with synthetic mooring lines, quantifying the damage and assessing the rope's residual strength after the event. The results suggest that an over-braided jacket made from DSM Dyneema fibre provides the best means of limiting the damage from trawler wire impact.

Ultra-deepwater HMPE moorings

Research by Lankhorst, and strategic technology partner DSM Dyneema, has shown that synthetic ropes made from ultra-low creep high modulus polyethylene (HMPE) fibre hold the key to overcoming the engineering and installation issues facing naval architects and installation contractors deploying ultra-deepwater, permanent moorings.

A new HMPE yarn introduced by DSM, called DM20, has enabled production of a Lankhorst Ropes Gama 98 deepwater rope with less than 0.5 per cent creep elongation over 25 years, meeting industry requirements for permanent mooring systems. HMPE ultra-deepwater mooring systems create many more opportunities for production at previously inaccessible water depths. And, although HMPE is more expensive than polyester, this is offset by an overall reduction in mooring system installation costs.

The higher strength DM20 yarn allows smaller diameter ropes for the same MBL compared with polyester. A polyester deepwater rope with a MBL of 1907 tonne has a diameter of 254mm and weighs 43 kg/m, for the same MBL the rope made with DM20 is only 190 mm diameter and weighs 16 kg/m. The smaller diameter and lighter HMPE rope allows more rope per reel, allowing more reels per vessel. And, as fewer reels are needed, these can be more readily handled by an anchor handling vessel. Importantly it will permit the installation of more mooring lines and anchors in one trip, a significant cost saving in vessel size and time when the platform maybe 250 miles offshore.

Another potential installation cost saving is in the area of pre-tensioning. During deepwater mooring system installation, polyester ropes are routinely tensioned using either a specialist, heavy lift, installation vessel or anchor handling vessel to pre-load the rope, increase its stiffness and set the initial bedding-in extension. For a wholly HMPE mooring system this would be unnecessary; although in practice there may be other reasons to apply a higher load especially with a MODU such as proof testing a vertically loaded anchor.

Storm survivability - hybrid ropes

Going further offshore can expose the mooring system to greater wave and current movements, however. Just as the elasticity of polyester is a limiting factor at ultra-deepwater depths, so too can be the stiffness of HMPE. In high storm and hurricane risk areas, the mooring system needs some extension to ensure storm survivability, especially in the Gulf of Mexico. One solution is to use hybrid moorings.

Hybrid mooring lines combine HMPE rope segments with polyester rope segments, to give a mooring that is neither too stiff nor too soft. They allow the mooring system designer to 'engineer' the mooring line's stiffness and use the lengths of polyester and HMPE segments to provide the stiffness needed to handle maximum loads during station-keeping in a storm, while ensuring sufficient elasticity to damp peak loads induced by waves.

The speed of HMPE creep is a function of HMPE type, temperature, mean load and loading time. The preferred hybrid rope configuration is the stiffer HMPE rope in the cooler water close to the seabed, and polyester rope in the warmer waters closer to the vessel. In high storm risk areas, the percentage of HMPE to polyester line lengths used in the hybrid mooring configurations will change as water depth increases, for example, at 1829-m water depth: 50 per cent-50 per cent HMPE/polyester, at 2286-m water depth: 60 per cent-40 per cent HMPE/polyester and at 3048-m water depth: 75 per cent-25 per cent HMPE/polyester.

Of course, as the hybrid mooring system uses polyester this may still need to be pretensioned. However, recent developments in pretensioning practice have suggested that mooring systems designers should only proof test to what they need to ensure the maximum excursion limits are not exceeded and that there is no need to automatically go to 40 per cent MBL, which until now has been the 'norm' for deepwater moorings.

Increased mooring systems options

The ability to use HMPE ropes, made from Dyneema DM20, for permanent deepwater moorings is an important development. It is a mooring technology grounded in the need to assist naval architects in striking the right balance between the engineering and economic demands of deploying deepwater moorings. In addition to increasing the scope of synthetic rope for ultra-deepwater moorings, it demonstrates Lankhorst Ropes' ability to offer a far wider range of mooring options, and with this greater flexibility in the design and engineering of mooring systems. OTC

> the company is researching new mooring rope materials better suited to the engineering and practical challenges of mooring in ultra-deepwater and busy fishing areas

Lankhorst Ropes
lankhorstropes.com

Services
Next generation mooring systems

A flexible approach

Above
Utility pipe with SAE flange

Below
Welding of utility pipe

With a heritage extending back to 1958, BHDT was originally established as the high-pressure technology division of the Boehler Group. In 1979 the division diversified its activities further by expanding into high-pressure pumps, before it was taken over as a private entity in 1996 under company president Dr Harald J Aichhorn. Adopting the name BHDT GmbH in 2007, the specialist designer, supplier and manufacturer of high pressure equipment and components for the chemical and petrochemical industries used its contacts and expertise within these industries to make the logical step into the oilfield market in 2009. This move proved highly fruitful for BHDT, as it witnessed dramatic growth of 50 per cent, year-on-year, since 2011. Keen to continue this success, the company focuses on retaining a balance between its traditional approach to business and continued improvement, thus ensuring it can meet the stringent and developing needs of customers within the oil and gas industry.

As a smaller player in the market, BHDT focuses on the design, finite element calculations, purchasing, fabrication and quality control for niche, NORSOK conforming products. These include a broad spectrum of compact flanges, orifice spacers and reducers, which are developed and manufactured with materials such as Duplex, Superduplex, high strength carbon steel and low alloyed carbon steel. Furthermore, by using its own methods, the company can produce pipe spools with complex shaped geometry while ensuring the length and perpendicularity of components are of the highest accuracy.

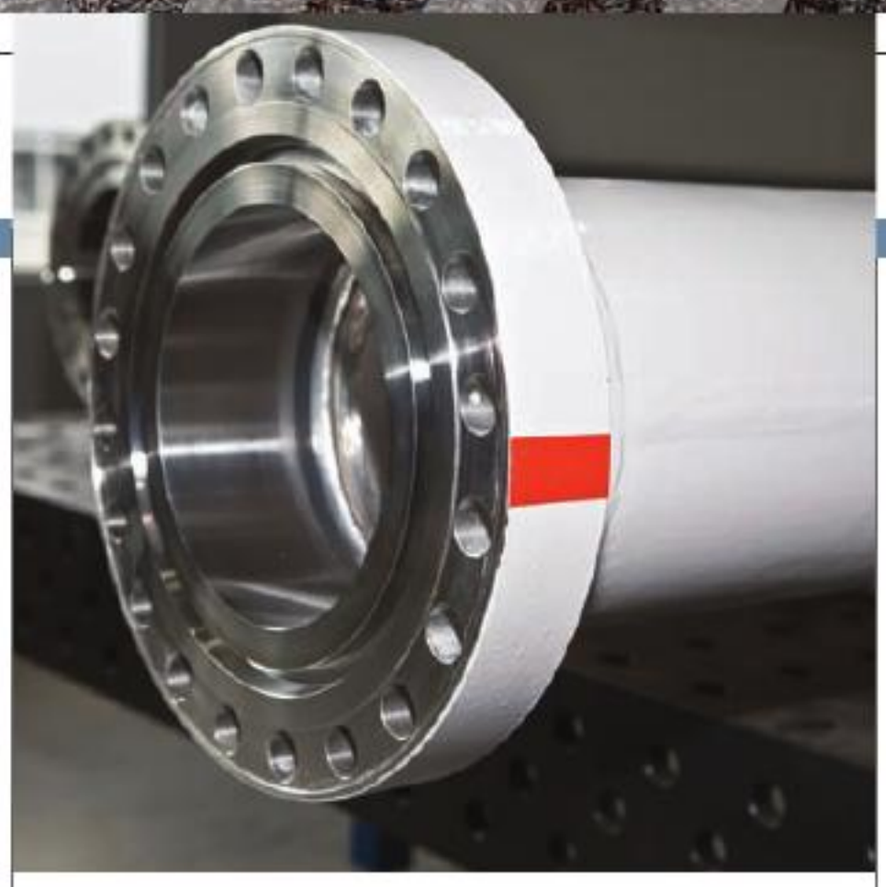
Previously featured in *European Oil & Gas Magazine* in November 2013, head of BHDT's oil and energy department Manuel Prohaska discusses the company's recent developments: "We have been very busy over the last six months, which is due to our strategic decision to considerably enlarge our scope of supply for FPSO's over recent years; recent notable projects for us include the FLNG Prelude project as well as the FPSO Ichthys project. In the past we were mainly involved in the fabrication of inner pipes in FPSO swivel stacks, but we are now involved in supplying the full package including the raw materials and the testing equipment (e.g. IX-seals for NORSOK flanges, bolting, pipes, elbows etc.) required for fabrication of the inner piping."

Indeed, by merging decades of experience with an innovative, forward-thinking approach to delivering solutions, BHDT has gained an excellent position on the global market and progressed into bigger and more complex projects, as Manuel highlights: "Due to requirements on the FLNG Prelude, we apply thermal sprayed aluminium (TSA) onto Duplex for the very first time. This kind of coating is normally used on carbon steel only,

which made the development of measurement devices to determine the dry film thickness of TSA difficult, as there are no devices such as these on the market yet, at least not with the requested accuracy. To develop these devices we worked closely with Helmut Fischer GmbH, a leading expert in coating measurement equipment supply."

Although relatively new to the oil and gas industry, BHDT's flexibility to market demand has led to the accumulation of an impressive customer base, such as SBM Offshore, Petrobras, Shell and BP. "We also have had a lot of orders with Aker Solutions for subsea blow-off preventer prototypes, and have delivered approximately 40 22 inch flanges that are now under serial production worldwide. We took our first order from Aker Solutions approximately six months ago, but the relationship has developed to the point it has become one of our biggest customers in the oil and gas industry, alongside SBM Offshore, which has been a major customer since the very beginning," says Manuel.

With a current structure of delivering sophisticated solutions within niche applications, BHDT works closely with its clients to ensure complete satisfaction; despite recently expanding into Brazil and China, the company is keen to retain its commitment to quality and product development, as Manuel discusses: "We will open an office in Brazil in September and will begin operations in China in approximately 12 months. However, as a small, but growing department within BHDT with some engineers and only several million in turnover the challenges remain the same; it is difficult to progress the business further when we are currently in the middle of some major



projects, and because of our limited capacity we are focused on successful and flawless project delivery to ensure customer satisfaction. It is a vicious circle really, we are always hiring new staff and looking for qualified people, but because our business is niche you need at least six months to train people properly, but again, if we are too busy with projects we are too busy to train."

As the company continues to reap the benefits of its long-term expertise and commitment to quality, BHDT will look to resource experienced personnel to aid its trend of ongoing growth, as Manuel concludes: "We have started a big research and development programme for ball valves, because they are the only valve type that is not overly common here. We deliver approximately 2500 high-pressure valves a year, but we see it is mandatory to implement ball valves into our scope of supply; this is why we are looking for offshore personnel with 20 to 30 years of experience, who can help our design staff to prevent mistakes and develop knowledge. Ideally we would like staff from Austria, but this is unrealistic, so we are looking for English speaking personnel who can potentially speak Portuguese for our office in Brazil." O&G

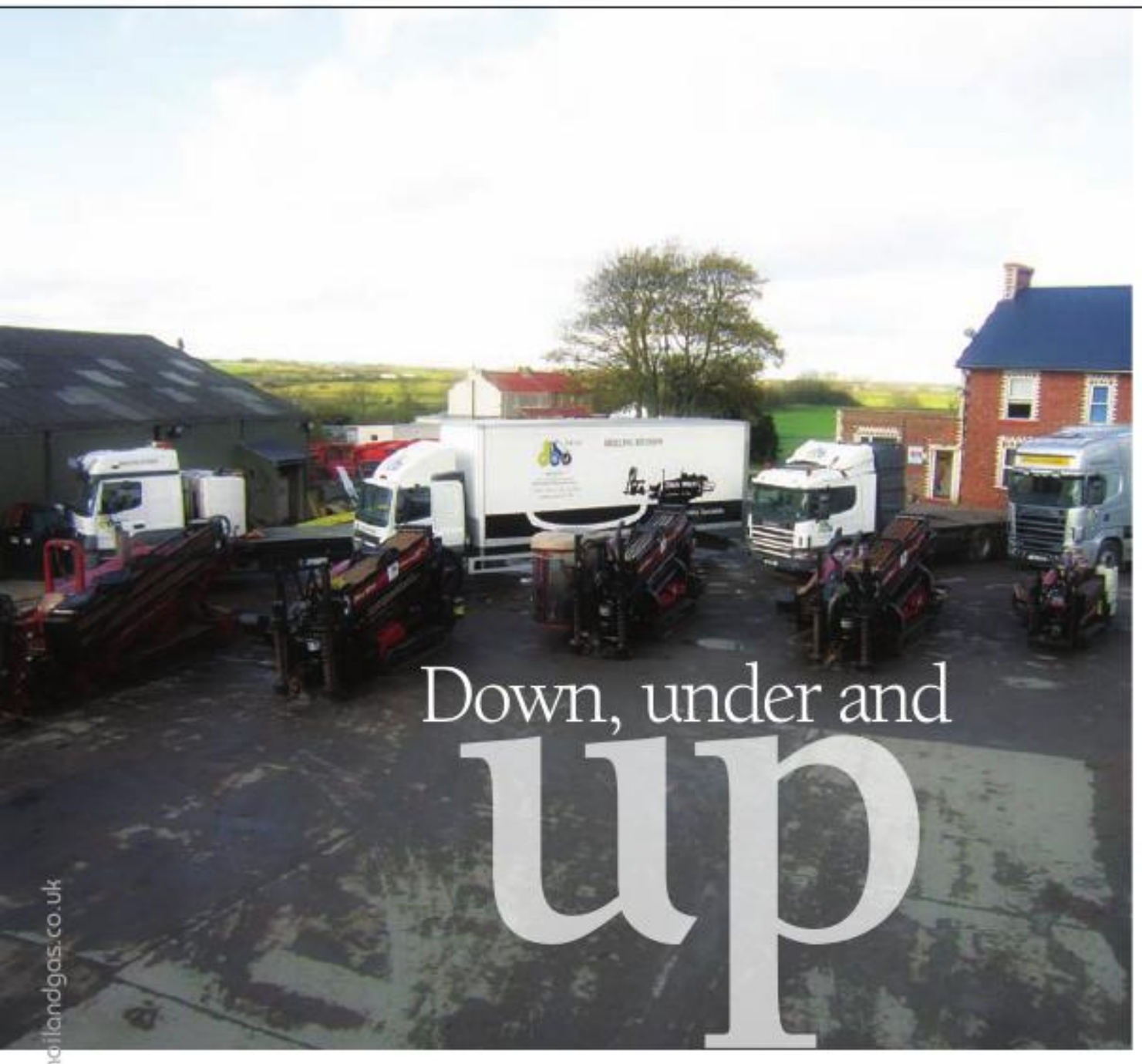
Left
Compact flange on inner pipe

Below
Inner piping finalised

As the company continues to reap the benefits of its long-term expertise and commitment to quality, BHDT will look to resource experienced personnel to aid its trend of ongoing growth

BHDT GmbH
bhdt.at

Products
High-pressure equipment and high-pressure components



Down, under and up

Established in 1996, PBU (UK) Ltd began operating as a multi-utility company. Through the first decade of trading it built up its specialism in horizontal directional drilling (HDD) and over the last four years has grown significantly, with a year-end turnover forecast at £20 million. Operating ten HDD rigs the business works throughout the UK from the northern regions of Scotland, to the western shores of Wales and beyond the eye of London. In the past 12 months activity has also increased in the Falkland Islands, Cyprus and Ascension Island.

"Growing our HDD expertise was a significant step for the business. The trenchless technology, with directional drills, eliminates the requirement for open-cut work with mini-diggers and the associated plant. The impact on the customer is substantially less, and with the work guaranteed, clients have happily converted to this modern method," says Lee Porter, managing director.

With its strengths highlighted through the success of a major wind farm project in the Falklands it established an international division in the challenging area. "The weather in the Falklands is tough. There is a particularly thin layer of ozone in the region so it is very easy to get burned. In one moment it can be cold, then hot, snowing or gale force winds, but it is the geographical position that poses the biggest challenge to operations. All large equipment and plant is transported by boat, with travel times up to three months. If there is a failure, we have to be ready to respond to overcome the situation," highlights Lee.

Despite the logistical challenge the business received very positive appraisals in the construction and has subsequently contracted further work on substations, feeder pillars and main switch circuits. Using its multi-utility and project management experience it has also undertaken domestic construction activities, working on tenders for new housing and schools, to which Lee adds: "We are also looking to construct a fuel pipeline, a contract with a scope that it is normally awarded to larger businesses."

Working with many top players in the industry, the business has built on its successes, even throughout the economic downturn. "We are still growing, and in terms of turnover we have almost doubled in size every year. However we don't want to grow too large, many of our successes have grown from our ability to operate as a strong but small unit. The success, growth,

and increase in turnover are attributed to having the right team. We have hand picked a strong management team and everyone has brought in a unique aspect to the business," explains Lee.

In a recent project in the UK, PBU drilled a total of eight kilometres beneath Harrogate town centre. The project would have taken 12 months using conventional methods, but instead was completed in just three. "There is less upheaval to the customer because you essentially only dig a pit at the start, and then another every few hundred metres, drilling from pit to pit. This eliminates the need for conventional plant and instead of full set-up, we perform with just four men. There is no congestion, and it is quick and quiet," Lee highlights, adding that throughout the operation there was not a single complaint made.

Recognised for its capabilities, PBU was contracted to ensure that a repeat of the 1966

Aberfan landslide disaster in Wales would not happen again. With the original cause being a build-up of water in accumulated rock and shale, the £1 million project entailed drilling through the mountainous rock creating ten shots side-by-side. Through this a perforated pipe was installed to drain the water down the mountain. "We are pursuing similar work as this method can overcome a common problem. Work within the drilling industry relies to some degree on word of mouth. Although we do have competition our customers appreciate the management and health and safety approach to projects. It really comes down to putting effort into the projects and building up a relationship of trust to achieve results," says Lee. Following on from its successes, Scottish Power contracted PBU to perform a drilling operation beneath the River Clyde in Scotland. With other companies previously contracted but unsuccessful, the business utilised its experience and skill to reach a successful outcome.

As a business that is dedicated to progress, PBU operates an apprentice and training scheme aimed at developing future talent, as Lee points out: "Some employees have worked within the company for 15 years, and as we take on more employees, we always look to pair the experienced with the new personnel so that they may pass down the fundamental knowledge. As we continue forward, we are confident of securing new contracts in the Falklands, competing for high-profile projects such as fuel pipelines and airfield contracts that historically were awarded to blue chip companies." With at least five years work in the Falklands PBU also remains focused on its business in the UK, which continues to grow. "We are going from strength to strength, and with only a few good utility and directional drilling firms on the market we feel that we are well positioned for the future," he concludes.

> In a recent project in the UK, PBU drilled a total of eight kilometres beneath Harrogate town centre. The project would have taken 12 months using conventional methods, but instead was completed in just three

PBU (UK) Ltd
pbul.co.uk

Services
Multi-utility and directional drilling contractor

Bespoke logistics

Founded in 2006, Heavy Load Freight Services (HLFS) LLC has developed a highly regarded reputation in the provision of multimodal freight management services including air, land and sea transport solutions. The company acts as one of three divisions within its parent organisation, the HL Khouli Group. Discussing the formation of HLFS managing director, Mohammed Adeib AL Khouli says: "When the company was started in 2006 in Dubai, its founder already possessed several decades of experience within the logistics industry. During that period there was a gap in the market for niche companies, because although large organisations already existed in the region new products were emerging within the oil and gas sector. Developments in underbalanced drilling, which mixed air drilling with nitration made it necessary for compact packages of equipment to be delivered in very short periods of time within the Middle East and the Commonwealth of Independent States (CIS). In this respect we were very much in the right place at the right time to provide the best solution.

"Despite the company being relatively small

we proudly serve a multi-national customer base, with destinations including Central and Southeast Asia, the Far East, CIS and Russia, the Middle East, Africa, North and South America including the Caribbean, and Australia and New Zealand." Mohammed elaborates. "This can be challenging at times but we were able to gain customer's trust and throughout 2008, 2009 and 2010 we executed some really extraordinary projects, which were perhaps not thought of as possible given the size of the business."

As the company has grown its service portfolio has expanded to include a number of speciality services, with HLFS identifying itself as a niche expert in the transport of vital equipment including oilfield equipment within the energy sector and in various small to medium projects that require a time sensitive solution. HLFS charters the correct vessel or aircraft for the job at hand and completes its multimodal service with land-based solutions comprised of a fleet of trucks and rail solutions.

Operating on a global scale inevitably brings with it a number of challenges, however HLFS' years of industry experience and a can-do approach enables it to find the most effective solutions to its clients' complex requirements. When it comes to chartering aircraft for example, there are several concerns to be considered as Mohammed outlines: "With its centralised location the UAE has easy access to Russian-built aircraft, which generally are able to accommodate more goods than a Boeing 747 but not as readily accepted in the west due to noise regulations. A 747 can carry goods of up to a height of 2.6 metres, the height of a 20-foot container, but often we will be tasked with delivering cargos that reach 3.2 metres in height, so this can be very challenging."

As many aircraft owners are not based at Dubai's main airport, the correct loading equipment is often not available to charterers making use of the planes themselves. "We have designed our own trailer with a mounted skid to roll cargo and equipment onto planes," Mohammed says. "Access to aircraft is granted via a ramp, however loading larger cargos onto the plane in this way can cause equipment to strike the aircraft's roof. This makes it necessary to approach the aircraft with the cargo held level to load it safely. It can be challenging sometimes to find the right solutions, but it is important to do so to avoid lost minutes because it is very expensive to have an aircraft on the ground."

Perhaps the most complex issue that HLFS addresses for its clients is to bridge the gaps that can exist between government regulatory bodies, industry regulators and operators. "At some point a project will always involve land transport. Within the Middle East companies use owner drivers, which means that with a rig move of 100 truckloads there are potentially 100 decision makers and pleasing everyone is a major challenge," Mohammed says.

A challenging project undertaken by HLFS was to co-ordinate the packing and transportation of an early production facility (EPF) from suppliers within the US, Canada, UK and UAE to Karachi, Pakistan. 15,000 freight tonnes of cargo had to be delivered from multiple locations within a six-month window, with limitations facing the project including axel limitations brought on by melting ice in Canada, non-uniform box dimensions of skids and the administrative challenges of delivering some cargos between the US and Canada. The job required large tanks and skids to be transported and also included the delivery of a tank for fire fighting, flown via dedicated freighter from Dubai to Karachi. Commenting on the success of the job and the pivotal role HLFS played in directing the project, Mohammed says: "This job couldn't have be successfully completed without close co-operation with all different agents, packers, crane companies, haulers, shipping lines and airlines in all countries involved."

The company has recently moved into a new office, bringing all of the Khouli Group businesses under one roof to enable closer collaboration and a one-stop solution for clients, and 2014 will see HLFS work to improve its online visibility and brand recognition, while exploring new markets, as Mohammed concludes: "The Middle East can be a volatile region, so we are looking to diversify our markets and deliver the right set for each region. That way if there is a shortfall in one country we have an alternative area in which to trade. This is why when working within the UAE it is important to develop good relationships the world over."

"Perhaps the most complex issue that HLFS addresses for its clients is to bridge the gaps that can exist between government regulatory bodies, industry regulators and operators. "At some point a project will always involve land transport

The whole nine yards

Originally founded in 1965 to take advantage of the demand for lobster, shrimp and snapper boats in the fishing industry, Brazilian firm INACE (Industrial Naval do Ceara) has since expanded its services to become the leading mid-size regional shipyard in the Northeast. Elaborating on the company's formation, commercial director Robert Gil begins: "A young economist, Gil Bezerra, founded INACE and focused on the boom of the lobster, shrimp and snapper fishing as well as the offshore and military shipbuilding opportunities in the region. Today INACE still belongs to the Brazilian founder, who has turned it into a family run business with three generations working at the yard."

Based in a coastal area close to the city piers of Fortaleza since its inception, the company's early years were spent building only fishing vessels, with more than 600 ships built by the late 1980s. However, when INACE noticed opportunities in growing markets it made the strategic decision to diversify its shipbuilding services and has since constructed more than 800 vessels of all types. These include workboats, tugboats, ferries, OSVs, DSVs, FSVs, crew boats, motor yachts, and patrol boats. Having developed a strong reputation for high quality shipbuilding in a broad range of markets, INACE divided its shipyard into four segments: INACE yachts, INACE military, INACE offshore/workboat and INACE repair/refit.

"INACE yachts has delivered more than 40 motor boats to clients all over the world, such as Europeans, North Americans and South Americans; the latter includes the Formula 1 and Formula Indy world champion Emerson Fittipaldi," boasts Flavia Barros, planning director at INACE. "Meanwhile, INACE military has built more than 20 vessels for the Brazilian Navy and three for the Namibian Navy; this division was responsible for the first patrol boat of 200 tonnes (NPa 200) and 500 tonnes (NPa 500) to be built in a local private shipyard for the Navy of Brazil. To work for the Navy we need our own specialised people to meet their internal standards with an intense supervision and strict testing methodology of developing, reports and studies."

Robert continues: "We are currently involved in another landmark project, a Hydro-Oceanographic River Ship (NHoFlu, 47 metre), which is currently under construction. Due for delivery in the final quarter of 2014, this vessel will give support for mapping the Amazon river and will be responsible for four 30 metre river vessels; these too was also built by INACE."

Although INACE is showing positive growth in the aforementioned segments, it is the company's offshore/workboat division that has witnessed the most demand over recent years. With growth opportunities significantly increasing as of 2007 from light oil discoveries found in the 'pre-salt' layer, Brazil's oil and gas industry is benefiting from a period of major development as it rests on approximately 14 billion barrels of oil equivalent. "The oil and gas industry has definitely boosted the shipbuilding

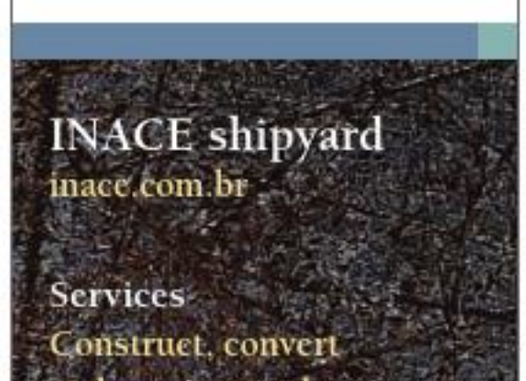
> INACE has become a reference for these routine repairs in the region due to our Syncrol-lift with capacity of approximately 1800 tonnes and dimensions of 70mx16m

industry in Brazil in recent years," says Flavia. "The offshore division has built more than 20 vessels for offshore customers; these include tugboat, supply vessels, crew boats and ferries. We are currently working on three main projects in this segment, which are two DSVs, two 500 pax ferry boats, and five research vessels with design and construction 100 per cent done by INACE. In addition, there are two tugboats with 60 tonnes of BP (RAMPART 2400) being built for TugBrasil, an important and old client, with the design coming from Robert Allan Ltd."

In addition, the company is also witnessing significant demand in its repair/refit division, which is due to the lack of repair shipyards in Brazil, as Flavia discusses: "INACE has become a reference for these routine repairs in the region due to our Syncrol-lift with capacity of approximately 1800 tonnes and dimensions of 70mx16m. A notable contract in this division was a special refit we developed on the motor yacht of three times Formula 1 champion, Nelson Piquet. The vessel was initially a mono-hull and the refit turned the vessel into a trimaran, with the state-of-the-art capabilities of a mega-yacht."

With a strong technical body, which includes more than 60 engineers operating in segments such as electrical, mechanical, chemical, industrial and operation, as well as naval architects and marine engineers, INACE has the skills and facilities to meet the needs of the most stringently regulated and demanding of customers, as Robert highlights: "INACE has a mechanical turning workshop that helps to fix shaft lines and propellers, especially for the repair/refit division besides our three CNC cutting machines, two cranes of 70 tonnes lifting capacity, small cranes for support and the manoeuvring of blocks, as well as small gantry cranes of five tonnes and ten tonnes in each shed. In addition, INACE acquired the ShipConstructor software around ten years ago, which makes the whole thus optimises the Nesting and production process."

While it continues to process more than 300 tonnes of steel and aluminium a month and works on completing the 16 vessels it has under construction, INACE benefits from 180 thousand square metres of land, which puts it in a coveted position to take on more and more projects in line with ongoing demand. "This is a key strength for INACE; we always have enough slots for new buildings and expansion due to the size of our land. Over the coming years we will be focusing on increasing our presence in other countries with a strong offshore/workboat market, which will raise the orders and stabilise the routine of our yard. We have delivered many motor yachts to clients in North America and Europe; this expertise can definitely migrate to our offshore/workboat division, which would also diversify our shipyard's portfolio from local clients," concludes Robert. OSG



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